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# THE LANTERN RECORD.

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## EX CATHEDRA.

MR. BENNETTO, the *soi-disant* discoverer of the secret of colour photography, has been interviewed by a representative of the *Western Daily Mercury*, published at Plymouth. The interview supplies amusing reading of a kind with which Mr. Bennetto has made the photographic world only too familiar during the last two or three years. The *Mercury* reporter says: "Since Mr. Wallace Bennetto, of Newquay, obtained patents in connexion with colour photography, he has been criticised severely. But he has not abated his energy. A representative of the *Mercury*, who yesterday saw Mr. Bennetto, found him busy, and sanguine that in the near future he will be able to convince even his most bitter opponents that the secret of colour photography has been discovered. 'The statements made by the BRITISH JOURNAL OF PHOTOGRAPHY,' remarked Mr. Bennetto, 'misrepresented the whole thing. Had I cared to do so, I could have completely upset every one of the statements made by that JOURNAL; but I have decided to adopt another course. Very shortly, probably in January, I intend giving a lecture and demonstration here in Newquay with the object of making the process clear to the public.'"

OF course we have made no "misrepresentations" at all. We simply published the full text of Mr. Bennetto's description of his own process, and, if there are any misrepresentations in that, the fault obviously does not lie with us. Nor have we made any "statements" which Mr. Bennetto or anybody else could completely upset. But there are a considerable number of questions bearing on the theory and practice of Mr. Bennetto's patented *réchauffé* of three-colour photography that we put to him in our issue of November 18 last (pp. 737 and 738), which he has not yet attempted to answer. "He regretted he had not time to answer all our queries" (BRITISH JOURNAL OF PHOTOGRAPHY, December 2, 1898, p. 783). And this from the patient, plodding genius who could, an' he would, completely upset every one of our statements (*i.e.*, answer our questions)! Science is distinctly the poorer by Mr. Bennetto's refusal to grasp the opportunity we purposely gave him of convincing the world that he has a grip of the subject about which he has been talking and writing so long.

\* \* \*

FANCY making his process "clear to the public" at Newquay, where colour photography is put to the test blindfold! Does it not all read like an extract from a Gilbert and Sullivan comic opera? Then, after his "patented" camera and process have, in our columns, been pulverised so far as their novelty and practicability go, we are told that "with my patent camera any one will be able to take a photograph in colours as easily as he now takes an ordinary photograph. The camera takes the picture with one exposure, the plates are developed by one operation, and a worker can print as many pictures in a day in colours as he now prints of ordinary photographs. This is my camera. You see it is rather smaller than the ordinary camera. The use of a red transparent glass in that frame, fixed at an angle of 45°, and special plates on the top and at the back of the camera, give the results. The camera is as easy to use as an ordinary one." Mr. Bennetto's "patent" camera and "patent" process must make any intelligent student of our columns since November 18 laugh with pity. Neither the camera nor the process, as described, is worth a snap of the fingers, and cannot be seriously regarded as the production of a scientific student of the difficult problem of colour photography.



'COLOUR photography à la Benetto is fairly easy. He says: "You see the difficulties are not so great as some would have the public believe. Many people have been here, and I have never refused to show any one of my pictures. Most visitors come doubting the genuineness of my discovery, but all go away astonished at the excellence of the pictures, and satisfied that I have solved the problem of colour photography. Doubtless there will be improvements on what I have done—I hope to make further advances myself—but I claim that I have solved the problem." Mr. Benetto's visitors (!) are satisfied that he has solved the problem of colour photography; but who are his visitors, and what do they know of the subject? And he expects there will be improvements on "what he has done." Possibly; but for two and a half years we and others have been asking, What has Mr. Benetto done? Nobody, except Mr. Benetto, appears to know.

\* \* \*

A *Treatise on Photographic Optics*, by Mr. R. S. Cole, M.A., late Scholar of Emmanuel College, Cambridge, will be published early in January by Messrs. Sampson Low, Marston, & Co., illustrated with numerous diagrams. The object of this treatise is "to provide an account of the principles of Optics as far as they apply to Photography, in a form which is of scientific value, while not of too abstruse a nature to place it beyond the reach of all but the professional mathematician or physicist."

\* \* \*

THE recent accident at an electroplater's, in Clerkenwell, when an entire family nearly lost their lives, serves to remind one of the dangerous properties of cyanide of potassium. The accident, according to the reports, arose from the upsetting of an electroplating bath and, at the same time, a vessel of sulphuric acid. The former consists of a solution of the cyanide of silver in cyanide of potassium, and the mixture of the two—the acid and the bath—sets free cyanic acid, the vapour of which is highly poisonous. Cyanide of potassium is not now much used in photography, except by those who work the wet-collodion process, as in making negatives for the different mechanical processes, where it is the usual fixing agent. Some operators have worked with the cyanide for years without experiencing the slightest inconvenience therefrom, while with others the fumes from it have had serious effects, much in the same way that metol is found to behave with different workers; with some it is inert, with others just the reverse. The ill effects from the fumes of the cyanide of potassium can be greatly mitigated by a little care. As a rule, the negatives are fixed over the same sink they are developed over; consequently, when the solution is washed off, it mixes with the remains of the acid developer, when immediately cyanic acid is given off; hence the mischief, if any. If separate sinks were used, or baths employed for the fixing solution, the ill effects of the cyanide would be reduced to a minimum.

\* \* \*

THE total eclipse of the moon last week was very disappointing to would-be observers in this country, owing to the wretched state of the weather. At all our observatories full preparations were made for important observations, both visually and photographically, but nothing could be done. We know that several amateur photographers, too, had made arrangements to secure photographs of the event, and they, of course, were dis-

appointed. The clerk of the weather in Germany appears to have been more propitious than ours here, for we read that at Berlin the Emperor and Empress watched the eclipse from the Palace, and that three of the Princes did so from the Observatory; also that there and at the other observatories in the neighbourhood of Berlin many photographs of the phenomenon were secured. Hence those who require photographs of the moon's eclipse of 1898 will have to take those "made in Germany," or elsewhere, as none were obtained in this country.

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THE Swedish Expeditions sent in search of Andrée have now returned home after thoroughly exploring and making diligent inquiries in Northern Siberia, but without finding any traces of him or the balloon. The *Standard's* Stockholm correspondent, telegraphing one day last week, says that the journey, though unsuccessful in the accomplishment of its primary, but almost hopeless, object, has not been without results of scientific value. It will be remembered that, when Herr Andrée first brought his project forward, and explained it in this country a year or two before he started, many English scientists were very sceptical as to its success, and expressed themselves very positively on the subject. Up to the present, unfortunately, their prognostications seem to be verified. Still there may be a possibility that he is safe. We fear, however, that, if he does return, photography will not be much benefited, from what it was surmised could be accomplished, as it is scarcely probable that any result will have been secured of any value after so long a lapse of time and the vicissitudes the gelatino-bromide films will have undergone.

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A FORTNIGHT ago we referred to the discovery of a factory in Belgium where fictitious works of the best masters had been produced in almost wholesale quantity, and that the principal market for these spurious pictures was America, where, it is alleged, they are to be found in some of the principal private collections. When alluding to this matter, we mentioned that American millionaires were always ready to pay large sums for European pictures, particularly for those of the most renowned of the old masters, not for national galleries, but for their own private collections. We now learn that Van Dyck's picture of the *Madonna*, which formerly hung on the walls of Blenheim Palace, has found its way to the United States. It is further intimated that its future resting place will probably be in a private collection at Baltimore. Our National collections are not yet so rich that we can afford that the best works of the old masters should be allowed to leave the country. However, the funds granted to the Trustees of our National Gallery are not sufficient to prevent it. More, perhaps, is the pity, so far as art is concerned.

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THE Court of Appeal of Paris has just pronounced judgment in an action brought by the Directors of the Porte St. Martin Theatre to restrain the editor of the *Photo Programme* from producing scenes from "Cyrano de Bergerac." The Tribunal of Commerce held that, the play being a public spectacle, its scenes might be photographed and reproduced by a third party without permission; but this judgment has been reversed by the Court of Appeal, which has decided that the scenery of a play is among the *œuvres de l'esprit* protected by the law of 1793. The *Photo Programme* is therefore forbidden to sell its illustrated programmes under a penalty of twenty francs per copy.



## HINTS FOR THE AVOIDANCE OF WINTER TROUBLES.

It will be fresh in the memory of most—the severe winter of some three years ago, when we had several weeks of hard frost, commencing in January and lasting well into March, and the inconvenience it caused to the majority of professional photographers in the form of frozen water supply, burst pipes, damaged property therefrom, and damp walls for, perhaps, months. Not a few of those who suffered those inconveniences saw how easily they might have been avoided had a few simple precautions been taken beforehand. Most of those who suffered then came to the firm determination that on the advent of the following winter they would be prepared for severe weather, whether it came or not. It would, however, be interesting to know how many adhered to their determination. Since the memorable winter of 1895 we have had no real “old-fashioned winter,” or anything that needed special timely care; but, with this fickle climate of ours, we do not know how soon we may again be involved in an arctic temperature, or how long it may last if we are. Are we prepared for it?

Curiously enough, but a week or so before the memorable frost alluded to set in, we sounded a note of warning as to what might happen, and the precautions that should be taken to avert trouble before it came, which, had they been acted upon, would have saved serious inconvenience to many. Hence our present reminder.

As to precautions, the first and foremost thing is the water supply, for without water little business can be carried on by professional photographers. In some instances the service pipe from the street to the premises is laid far too near the surface to resist, unless further protected, a continued hard frost such as that of 1895. With the service tap, though it may be deeply laid, the little shaft by which it is reached is often only protected by a loose wooden cover. This should receive first attention by being packed full of hay or straw, or, better still, with sawdust. Then there will be little danger of the frost reaching the tap. If the pipe from that to the building is near the surface of the ground, it should be further protected with more mould laid on and well trodden down. A still better plan is to cover it up with a foot or so of stable manure; its unsightly appearance, though rarely noticed in frosty weather, may be hidden by a few loose boards. This precaution need not really be taken until there are some indications of the approach of severe weather.

Any exposed pipes outside the building should at once be made safe, as only a few hours' hard frost is oftentimes sufficient, if the water is stagnant in them, to freeze them, and when once the water has congealed the trouble has commenced and will extend. Several thicknesses of old felt carpet or strands of haybands wound round them is a perfect protection. A special material for the purpose, “hair felt,” is now sold at most hardware shops, which answers admirably.

With regard to the pipes within the building from the cistern to the workrooms, there is little fear of their freezing during the daytime, when the water is in pretty general use; it is at night, or between the Saturday and Monday, that the trouble is most likely to occur. This may, however, usually be avoided by leaving the different taps continually dribbling, so that the water is in continual motion in the pipes; but that, of course, means waste of water, either at the cost of the consumer or the water company. The better plan, however, is to completely empty the pipes every night, so that there is nothing left in them to freeze. The simplest way of doing

this is to have a stop cock fitted immediately under the cistern, and, just below that, a small air cock, such as is fitted on hot-water pipes. Then, when the water is shut off at the cistern and the air cock opened, and all the lower taps are opened, the water will drain completely out of the pipes. The object of the air cock is to act as a vent, admitting air, otherwise the water could not escape from the pipes. A simple extemporary arrangement that answers the same end, though less convenient, is to plug the pipe from the tank with a piece of tubing—iron “gas barrel” for example—of sufficient length to reach above the top of the water. Then, if all the taps be opened, the pipes will be emptied, and air will be admitted to them through the plugging tube. With the above precautions there need be little fear of inconvenience with the water supply, even with a good spell of wintry weather.

If perchance, through want of care, the pipes get frozen, there is a very probable chance that some of them have burst. Now, there used to be the idea and it still prevails with many of the public—and some plumbers, notwithstanding what the Plumbers' Company have done for the craft—that the pipes burst with the thaw. Of course, that is a fallacy; they burst with the expansion of the water when it freezes, and the fracture only becomes manifest, unless sought for, with the thaw. When any of the pipes are found frozen, they should at once be carefully examined throughout their length, and the fracture, if there is one, will be seen by the bulged metal and protruding ice. Then the plumber should be immediately sent for to do the needful, and thus save a flooding; also, while the frost lasts, plumbers are usually at a discount, while after a general thaw they are usually at a premium, and often a high one too. If a thaw sets in before the burst is detected, the best way of dealing with it, if the supply cannot be quickly shut off, is to, with a hammer, batter up the pipe itself a few inches from the rupture and thus effectually close it. This treatment will add a little to the plumber's bill, but it will be more than compensated for in the mitigated damage to property, and possibly wet walls for weeks. When the premises are heated by hot-water pipes, special care of them is necessary in severe weather, for if anything goes wrong, there is no other means of heating. The fires should never be allowed to go out, night or day, for, if the pipes freeze, some of them are almost certain to have split, or the joints ruptured. A very small fire is, however, sufficient to keep the water in circulation and thus avoid the freezing. Should, however, from neglect, the pipes have become frozen, the fire should not be started before they are thawed by some means or other, as it might cause an explosion of the boiler. The supply pipe to the boiler, which really acts as a safety valve, should be specially looked after, for any blocking of that might lead to equally as disastrous a result as that just alluded to. It is well at this season to keep the old proverb in mind, “A stitch in time,” &c.

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**A New Mode of Making X-ray or other Vacuum Tubes.**—Professor Dewar, at a recent meeting of the Royal Society, showed a beautiful experiment, the final result of which was the production of an almost perfect vacuum tube. The end of a closed tube containing air was rapidly dipped into liquefied hydrogen, and the contents of the tube quickly condensed in the state of solid air. That part of the tube from which the air had been so removed was sealed by heat and separated from the rest. It was then found to possess an extremely high vacuum, so high, indeed, that an electric current could scarcely be passed through it.



The rapidity of the operation was extraordinary, one minute's immersion being enough to bring down all the air and produce the vacuum.

**A Non-inflammable Celluloid.**—M. Béthisy has obtained a French patent for the manufacture of a celluloid that is non-inflammable. The process of manufacture is the same as usual, so far as the manufacture of the nitro-cellulose, but ten to fifteen per cent. of dried egg or blood albumen is added, and ten to fifteen per cent. of powdered mica to obtain the transparent kind, and ten to fifteen per cent. of alum and asbestos in powder for the opaque kind. It is further incorporated with vaseline oil dissolved in acetic ether, and then solution of chloride of zinc and white gelatine is added, and the mass allowed to stand for some hours and then pressed into blocks.

**Purification of Acetylene.**—Dr. A. Frank has recently obtained a German patent for the process of purifying acetylene by passing it through a solution of cuprous chloride acidulated with hypochloric acid. Experiments have shown that with a litre of the liquid fourteen cubic centimetres of acetylene, which was obtained from calcium carbide of bad quality, could be completely purified. The purifier may also be used in the solid form. It removes from the gas all prejudicial and ill-smelling impurities without in any way affecting the acetylene itself. The purifier can be, after use, at once purified by simply boiling. The cost is, therefore, very low, about half a pfennig for a kilogramme of carbide. The purified gas does not develop smoke when burning, and has a pleasant smell of aldehyde. The burners are, moreover, not attacked or clogged up, and the purifier is not, even after continued use, in any way dangerous, and will not contain any explosive compound. Other metallic salts may be used, but their action is not so intense nor so economical.

**Aluminium for Scientific Instruments.**—It needs only a glance at an optician's shop to see how great a hold this metal has taken of the makers of opera glasses, telescopes, photographic lenses, &c.; but, when we come to look round at the workers with these and other such instruments, we do not see them in common use. The reason is simple, the high price of most instruments where aluminium replaces brass. Whether that excessive price will ever be done away with is an interesting and fruitful subject for conjecture. Every year almost sees a reduction in the price of the raw material of the metal itself. That made by the agency of the Foyer's Falls, we read, is now priced at one-and-three-pence per pound, which for equal bulk is cheaper than either copper, brass, or tin. The metal as first produced is not pure enough, and is sent to Milton, in Staffordshire, where it is brought to a refined state of purity. Seeing that the Milton works are built to enable four tons a day to be turned out, there is evidently a demand *in esse* or *in futuro* somewhere.

We notice that quite recently a microscope constructed entirely of aluminium, except the wearing parts, was exhibited at the Quekett Microscopic Club. Its lightness was admired, but that was looked upon as about the only gain against increased cost. So far there is no doubt that aluminium is difficult to work, difficult to solder, difficult to cut for screws; but we see no reason why an efficient alloy should not be invented which would nullify all these disadvantages. Meanwhile, at a price of one penny per ounce, we feel that it ought to be largely available for photographic purposes.

**The Royal Academy.**—The Royal Academy Winter Exhibition is now open. This year it is limited entirely to the works of Rembrandt. This old master's work, it is well known, was more entirely confined to figure studies than to anything else, lighting and grouping being very important features. This fact makes this year's show of special interest to photographers, at least to those who make that phase of photography their study. The Exhibition

at Burlington House includes the greater portion of the pictures shown at the Rembrandt show last year, at Amsterdam, with some additions, amongst which are some lent from the Queen's private collection, that were not shown in the Dutch Exhibition. In all there are over a hundred works on view, in addition to a collection of pen-and-wash drawings. As just intimated, photographers will do well to see and study the pictures now on view, for it must be confessed that many have still much to learn in the matter of lighting and posing, as well as in the grouping of figures—that is, if one may judge from the photographs shown in recent exhibitions of the Royal and the Salon, where, when strong contrasts in lighting have been attempted, they were exemplified by crude lights and deep shadows, without a trace of detail. Such was not Rembrandt's style. For years past portraitists have produced "Rembrandt" photographs; if the majority of them were to visit Burlington House and see the great master's works—and such a collection may never be on view again—they will see that most of their productions have been mere parodies on Rembrandt.

**How to Make Sure of Seeing the Great Meteor Storm.**—In view of the almost certain occurrence of the great meteor shower next November, and the possibility of observers' hopes being frustrated by bad weather, we read that at various places balloons are to be constructed that will be capable of conveying the astronomer beyond risk of cloud contingencies. Already three stations have been selected—in Europe, in America, and in Central Siberia respectively. At first the arrangements will be purely experimental, and will be managed by M. Janssen.

#### BY THE WAY.

How true it is that "the best-laid schemes of men and mice gang aft agley!" The technical side of photography has always had at least as much attraction for me as the merely pictorial. I have taken pleasure at various periods in preparing my own plates, making my own emulsion and collodion, even in albumenising my own paper and coating my own carbon tissue, and, if the outcome of my efforts were not absolutely up to the standard of the regular commercial article, at least the pictorial results obtained therewith gave me infinitely more satisfaction. But those results have always been confined, or nearly always, to picture-making within the bounds of my limited capacity, and the higher branches of the science have troubled me very little. It was rather as a change, then, and partly out of curiosity, that I availed myself of an opportunity the other evening of assisting in the photographing of the lunar eclipse.

I dare say a good many more besides my friend and myself had formed somewhat similar plans for that same evening, but there is where the "men and mice," &c. proverb comes in; or, as our friends across the Channel have it, "l'homme propose, mais Dieu dispose." I attended a "full-dress rehearsal" on Boxing night, and everything went as smoothly—to use the chief operator's simile—"as half a pound of butter on a hot plate." Man's portion of the arrangements had been adjusted to a nicety, and those beyond his control were simply perfect, and no one could have wished for greater success than attended the production of a trial series of pictures of the moon taken at regular intervals. Wednesday night, again, was another perfect one for the purpose, and why the eclipse should be sandwiched in between two such opportunities is difficult to conjecture, for all that it was possible to see at intervals was a hazy vision of the moon obscured by scudding clouds of varying density passing at hurricane velocity in an easterly direction. Knowing that such a performance had been set down for that particular evening, there was just sufficient evidence to lead one to believe that the principal actors were fulfilling their parts; but, in the absence of any previous knowledge, I doubt whether the fact would have suggested itself to any one. In short, the total lunar eclipse of December 27, 1898, was a dismal failure and disappointment.



But it reminded me of a similar occasion—though it was only a *partial* eclipse, if I remember rightly—some thirty odd years ago, and set me thinking of the difference between “then” and “now.” I happened to be spending the evening with an old friend, who was not only an amateur photographer, but also an amateur astronomer of a most enthusiastic kind, and many a cold, frosty night have I wished his huge telescope at Jericho or the bottom of the sea, as with half a dozen overcoats and mufflers on, but with *bare hands*, I manipulated the adjusting screws of the speculum, and did my best to follow his orders, “turn right,” “turn left,” or “turn bottom,” shouted from the top of a ladder, where he performed some mysterious ceremony with a lantern at the open end of the tube, and didn’t seem to think it a bit cold. Of course, when ten o’clock or so came, we had to turn out to see how the eclipse was getting on or “promising.” On that particular occasion I did not mind, as I had never seen an eclipse through a real “astronomical” telescope, so I joined in with perfect willingness in getting things ready. Like many other mundane pleasures, the reality fell far short of the expectation; in fact, I liked it better without the telescope.

However, when we had had enough of it, we returned indoors and discussed it from a photographic point of view, my friend waxing eloquent on the subject of photography as a possible aid in astronomical research, if only plates and lenses were more rapid. Of course, long previous to the period I refer to, photography had been utilised by astronomers, but only in portraying our two principal luminaries, and then only with the aid of the appliances of a well-equipped observatory; but my friend’s dream was to so far curtail the exposure that no transit instrument, no machinery of any kind, should be needed, but that an amateur like himself should be able, by practically instantaneous exposure, to secure permanent records of the heavenly bodies, that he could study at his leisure. This aspiration, so far at least as the rendering of anything but outline is concerned, has not yet been realised, even with regard to the sun and moon, but another dream, to which he attached even greater importance and looked upon as even more difficult of attainment, has been more than fulfilled. That was the securing, by means of photography, accurate maps of the heavens, with all the stars of any importance in their correct positions; and, impossible as it seemed to him at that time, he lived long enough to be familiar with not only the achievements of Dr. Roberts, the Brothers Henry, and others in that particular direction, but also of Dr. Huggins, Janssen, and others in the apparently still more difficult branch of spectroscopic work.

So far as the simple rendering of an eclipse is concerned, or even a star transit, his idea of bringing such work within the reach of the amateur has been realised, and it is now some years since the first successful attempts were made in this direction; but it was not until the other evening that I realised how comparatively easy it really is to one who lays himself out intelligently to do it. The instruments used by my friend on that occasion were simply his ordinary landscape camera and lens, the latter an anastigmat of about ten inches’ focus, I think. An arrangement had been previously made by which the camera could be set in such a position that the moon’s track crossed the centre of the plate, and “off and on” exposures made at intervals of, I think, ten minutes, gave a series of distinct images of the moon on different parts of the plate. Of course the images were small, but sufficiently sharp with the lens used to bear enlarging a good many diameters without losing what definition would be necessary to show the different phases of the eclipse. Equally, of course, the image would only represent the unobscured portion of the moon’s disc at each phase; but to the lay mind that is about all that constitutes an eclipse.

How much the optician, and how much the chemist, respectively, has contributed to this latter-day result it is not easy in a moment to calculate, but they have both done their share since that evening, thirty years ago, when my departed friend “dreamed dreams.” I remember about the same time, in some editorial remarks in this JOURNAL on the subject of instantaneous photography, it was suggested that the onus of further progress in that particular

direction rested with the optician rather than with the chemist. At that period wet plates had apparently reached finality so far as sensitiveness was concerned, for they had made no advance for some years; dry plates were hopelessly behind wet, and there was no prospect of any new departure, so the onus was thrown upon the optician to supply us with quicker lenses. The inadvisability of prophesying unless you are “in the know” is proverbial, for, although the wet plate remains much in the same position, as regards rapidity at least, as in the mid-sixties, the “chemist” has come manfully “up to the scratch” by making the dry many, probably hundreds of, times as quick as anything existing at that time.

But the optician has been far from idle, and for such work as star-mapping, at any rate, his labours in shortening exposure have been little less important than those of the chemist. I do not remember whether the reference to the optician’s duty which I have quoted was made before or after the advent of lenses of the rapid rectilinear type; but, so far as concerns the kind of work I have just mentioned, it makes little difference. But, for general purposes, compare the lenses of the early sixties with those of to-day. The veriest tyro nowadays must have a “rapid rectilinear” with his “complete set” if he can afford it, and looks with scorn upon the humble “landscape lens;” the more advanced man treats the “R. R.” with almost equal contumely, though in its day, and even now for many purposes, its performance is not to be despised; and on its first introduction it was in reality a “new power” in the hands of the landscape photographer.

Previous to that the best lenses, doublet and triplet lenses, mind you, not to be despised at the present day for performance, were slow according to modern notions, but I will venture to say that at least nine-tenths of the work done—and all the best early work—was done with the despised single lens. Roger Fenton’s Crimean series, Frith’s 24 × 18 Egyptian and Holy Land views, G. W. Wilson’s and Francis Bedford’s landscapes, and Mrs. Cameron’s portraits, to say nothing of a very large proportion of the best amateur work, all came from single lenses; and, let it be said, much of that work would hold its own in any company to-day on all points but rapidity. But the single lens of that day, it must be admitted, was a slightly different article from that of the same type prevailing now. It was, in fact, the almost universally employed instrument, and the optician devoted to its construction as much care and trouble as he does now to the most expensive anastigmat, and, as a consequence, instead of getting a quarter-plate single lens for half-a-crown or three shillings and sixpence, as I have seen them advertised, you had to pay a decent price for them. The 4½-inch focus lenses of Ross and Dallmeyer ran from twenty-eight shillings to forty shillings a piece according to the style of mount. I have in my possession at the present time, and have had it as long as I can remember, a lens by Lerebours and Secretan, and “signed” by the latter, that I would not exchange for half the rapid rectilinears of the same focal length (six inches) that are “going” nowadays. In fact, for pure landscape, it will do what nine out of ten of them will not, and do it better than most of them, namely, cover a half-plate to the corners. I have used it, with a small stop, as a wide angle on 7½ × 5, but that was rather a strain. Its full aperture is equal to  $f\cdot5\cdot65$ , or half the rapidity of a portrait lens, and with that opening it makes a much sharper portrait than many I have seen exhibited.

Carey Lea, in his *Manual of Photography*, published nearly thirty years ago, or perhaps quite thirty, lays it down that, for copying line engravings, the “stop must not exceed  $f\cdot60$ , or one sixtieth of the focal length.” Probably, so far as the very best of existing lenses at that time were concerned, he was quite right; but what would he say of modern anastigmats, which will give an absolutely better result working at, say,  $f\cdot7$ ? This alone means a gain in rapidity, solely due to the optician, of about seventy-five times.

But I have more than filled my allotted space, so I will conclude by wondering whether in another thirty years we—or those of us who may be left—shall have gone back to single lenses made from achromatic glass, and absolutely free from aberrations of every kind.

DOGBERRY.



## HAZE, AND THE USE OF LIGHT-FILTERS IN LANDSCAPE WORK.

"AERIAL surf upon the shores of earth," is Thoreau's refined and poetic description of a condition of the atmosphere well known to landscape photographers, and, perhaps it is safe to add, well dreaded also; for on the days of this haze the topographical photographer who has any distances to contend with may, if he be a user of undyed plates, conscientiously make holiday, his labour, under such conditions, being about as profitable as were the labours of the classical Sisyphus. But there are degrees in haze, as in so many other things; and the experienced landscape worker knows many degrees between the light heat haze that just flims over the distant mountains, scarce blotting out their details, and the uncompromising haze that invariably rolls in with an easterly or north-easterly wind, and which effectually stops photography where any distance is comprised. The mean of these two extremes is the debatable land of photographic possibility. On such a day the undyed plate is absolutely useless, and photography with dyed plates is only possible when deep yellow, verging on orange, filters are used. Let it be borne in mind that topographical photography only is held in view in thus taking up the cudgels for deep light-filters in landscape work; artistic photography, whatever that may be, and studies of "effects" are emancipated from the trammels that hedge round mere topography.

My own outfit consists of three light filters, increasing the exposure in geometrical progression, thus:—

2, 4, 8.

No. 2 is a very slightly tinted screen, with which drop-shutter exposures can be made if necessary. No. 4 is the most useful generally; it filters out more of the blue, and, when a fair amount of haze is present in the atmosphere, it preserves the distance in a way no ordinary, or orthochromatic, plate without a screen possibly could. No. 8 is a *derrière resort*, and priceless in its usefulness. Much has been written against the use of deep filters in field work, and it is obvious that one would only resort to them under circumstances of exceptional difficulty; but, where such occur, the deep screen, and that only, is the one possible solution. Many times during the summer of 1897, so phenomenal for its haze, the deep filter enabled me to obtain subjects that would either have remained untaken or have necessitated days of tedious waiting for clear weather. Over-correction is inevitable when using such deep screens, but in very many subjects it does not make itself felt to any great extent; and in mountain districts, where such a filter reaches its greatest usefulness, the disadvantage of over-correction is at its minimum.

Much of the evil ascribed to the use of deep filters arises from under-exposure. Using the No. 8 screen above mentioned, it will be found that where subjects have bold foregrounds, broadly lit, it is quite safe to add fifty per cent. to the light resisting value of the filter, over-exposure rarely or never resulting. Only when the subject is open and devoid of shadow masses is it desirable to keep near the exact multiplying power of the filter. When working on the coast, the erroneous correction given by the deep filter to the water is really a serious drawback to its use, and necessitates the negative being doctored before printing, otherwise the low tone of the sea in the print becomes painfully offensive. This can be obviated by covering the water in the finished negative with a single thickness of papier minéral, which gives in the print a close approximation to the correct tone. The defect just mentioned is not the only one accompanying the use of this especial filter; when it is most required, i.e., when the haze is too dense for filters of medium depth, there is usually almost an entire absence of clouds, and the blue of the sky, already degraded by the haze, is removed to such an extent by the screen that in the print the sky is represented as a uniform deep tint. This necessitates lightening the sky portion of the negative with tracing paper, or adopting the more heroic measure of completely blocking it out with black varnish and printing in a sky from a second negative, which, where possible, is the most satisfactory course. It may be said that these defects in the deep filter are quite sufficient to condemn *in toto* its being used out of doors, but the fact remains that with judicious after-treatment of the negative its use enables the topographical photographer to get work done that otherwise would have been impossible.

When the photographer is compelled to work in dull weather, with overcast sky, the use of yellow filters aids enormously in getting results superior to those obtainable with ordinary plates. The greens are brightened up, and the distance rendered clearer to such an extent that a landscape photographed with a deep filter under a dull, heavy atmosphere will often have the appearance of having been taken in a good diffused light. This fact alone should make the use of orthochromatic plates and light-filters commendable to the professional photographer, who, indeed,

seems the most persistent in ignoring their aid. Another direction in which filters, and notably deep ones, become extremely valuable in the work of the professional photographer, is in photographing buildings in large towns, where smoke, haze, and congested thoroughfares make it almost impossible to obtain good results when working in the ordinary manner. The shadows are covered with grey haze, and the exposure has not been quick enough to avoid movement in the traffic, nor sufficiently prolonged to obliterate it altogether. But, use an orthochromatic plate and a deep enough filter to clear away the haze, the long exposure necessary under these conditions quite obliterates the effects of the traffic, and the result is a photograph with clear shadows and an absence of blurred figures in the foreground.

The most convenient place for the filters is behind the lens inside the camera. For landscape work my lens outfit consists of a casket set ranging in foci from three inches to three feet; the mounts of the various lenses are of one diameter, and the three light-filters are mounted in flanges that slip over the mount of the posterior lens inside the camera. It is therefore the simplest matter possible to affix either one of the screens in position just before inserting the dark slide. With filters, 2 and 4, the focus of the lens remains undisturbed, but, when using the deep 8, it is necessary to finally focus the image after the screen has been placed in position.

There is little doubt but what the average photographer has seriously misunderstood the orthochromatic plate, especially when applied to landscape work. He has probably tried them in the field against the ordinary plate, and upon the first subject that came to hand, the difference has been inappreciable, and he has consequently rejected their use. It has never occurred to him that the real value of them to the landscape worker lies in their sensitiveness to the yellow filter, whereby he is enabled to eliminate the haze that mars his distance. When I recall the days of tiresome waiting for absolutely clear weather that, in my own experience, these friendly filters have obviated, my feeling is one of gratitude to orthochromatic photography, and in reflecting on the apathy, almost amounting to antipathy, shown by the average photographer to their use, I cannot help quoting "There is no darkness like ignorance."

GEORGE T. HARRIS.

## METHYLATED SPIRITS.

There is hardly a substance used in connexion with photography in the United Kingdom about which so much misunderstanding exists among amateur and professional photographers as the article called methylated spirits. I therefore propose to correct this misunderstanding from a reliable source, so that in future your readers may know how and where to obtain this very useful and, in many cases, indispensable article.

Methylated spirit is the outcome of a demand made in 1855 by the manufacturers of the United Kingdom for liberty to be allowed to use duty-free alcohol or spirits of wine in the arts and manufactures to enable them to compete on equal terms with the foreign manufacturer who enjoyed that privilege in his own country. After an exhaustive inquiry and series of experiments by Mr. George Phillips, founder of the Inland Revenue laboratory, out of which has grown the present Government laboratory presided over by Dr. Thorpe, it was found that, if about ten per cent. of wood naphtha were added to spirits of wine, the mixture, while retaining all its properties useful to the manufacturer, becomes so nauseous to the taste as to be absolutely unfit it for use as a beverage, and consequently its use duty-free in the arts and manufactures, under reasonable restrictions, would be unattended by any danger to the revenue derived from spirits. These conclusions were subsequently verified by a committee of distinguished chemists, and legal sanction was without delay given to the proposal, resulting in immense benefits to the home manufacturers.

The mixture is now made under the superintendence of the Excise authorities by distillers, rectifiers, and licensed makers. The spirits used are technically called plain British or unsweetened foreign spirits, not less than fifty per cent. overproof, or rum not less than twenty per cent. overproof, and they are mixed with one ninth of their bulk of wood spirit or naphtha not less than sixty per cent. overproof and previously approved by the Commissioners of Inland Revenue. This is now commonly known as "ordinary" or the old quality of methylated spirits, and is the only description fit for use in photography. It can only be obtained from the makers in quantities not less than five gallons at one time by persons who have received the requisite authority from the Commissioners of Inland Revenue, who generally grant such authority to all *bona-fide* applicants.

Some few years ago, in order to counteract a tendency among certain



classes of the people to use methylated spirits as a beverage and substitute for duty-paid spirits, and as the methylated spirit so used was obtained from the licensed retailers of such spirits, such as oilmen, grocers, chemists and druggists, it was found necessary, for the protection of the revenue, to further contaminate or denature the spirit by the addition of three eighths of one per cent of crude mineral naphtha, supplied for sale by retail, in quantities not exceeding one gallon at a time by retailers. This mixture becomes cloudy on dilution with water, it is the only quality which can be purchased from retailers, and, owing to the presence of mineral naphtha, is quite unfit for photographic purposes.

Another variety, often sold to inexperienced amateurs and professionals by oilmen, chemists, and others, as methylated spirits, is technically known as "finish" and contains in solution at least three ounces per gallon of gum resin. Needless to say this article is unfit for use in photography. I will now summarise the foregoing. There are three mixtures of duty-free spirits allowed to be used in the arts and manufactures:—

(1) Ordinary methylated spirits, to be obtained only on the authority of the Commissioners of Inland Revenue from authorised makers in quantities not less than five gallons at a time. Authority to use the spirit may be obtained on application through nearest supervisor or officer of Inland Revenue. The application, if *bona fide*, is rarely refused, but the Commissioners may require bond for the proper use of the spirit. This is not, however, insisted on when the quantity used in a year does not exceed fifty gallons and a still is not kept. On receipt of the necessary authority, the local supervisor will furnish the user with a "Requisition Book" and, on forwarding one of the forms of requisition properly filled up, with his order to the maker, the quantity of spirit requisitioned will be supplied accompanied by a permit, which must be preserved and handed to the supervisor or officer of Inland Revenue, who is obliged to visit the premises occasionally to see that no improper use is made of the spirits.

(2) Mineralised methylated spirits. As stated, this is specially prepared for sale by retail, and is the only description of methylated spirits which can be obtained, except as in (No. 1). It is, as previously stated, quite unfit for photographic purposes.

(3) Finish, is in fact a kind of polish, about which enough has been already stated. While on this subject, it may be well to point out that users of methylated spirits subject themselves not alone to the loss of the privilege of using the spirit, but also to extremely heavy penalties for purifying the spirit in any manner whatever, whether by "dehydration," "treatment with caustic potash" "filtering from quicklime," or "distilling off in the usual way," as I have recently seen, no doubt erroneously, recommended by an important firm in a useful little monthly.

THOMAS LOWRY.

## PHOTO-CERAMICS.

[Translated from the *Deutsche Photographen Zeitung*.]

It is a remarkable sign of the times that at the present moment, when photography is prostrate as an industry, there should be so much long-winded, gushing talk concerning its artistic character. I do not think this will help the small photographer in the least, and it is far more useful to give him practical advice, showing how he may add to his income with the apparatus and appliances he possesses.

This is not so easy as it may appear, as many branches, such as enlarging, architecture, landscape, &c., no longer come within our scope. Something new and original must be offered to the public, and, from our point of view, this is possible by turning one's attention to the production of photographic enamels.

It will be objected that the process involves technical skill that the ordinary photographer does not possess, as it is necessary that he should combine with the knowledge of his own profession that of the enameller in order to produce photo-ceramics.

This objection is not altogether groundless, but it is not so important as it may at first sight appear. We start by learning a variety of things, but it then appears desirable to specialise by division of labour, which may be seen in England at the present time. But many imagine that photo-ceramics are surrounded with great difficulties, even in the purely photographic part of the work, which is not the case. It is my object to offer some explanation of these and some other difficulties, and I hope the reader will give them a favourable reception.

By photo-ceramics we understand the preparation of burnt-in pictures upon porcelain or enamel plates with the assistance of photography. As these pictures have to be burnt in upon the material selected, it is apparent that their preparation must differ somewhat from the photo-

graphic processes ordinarily used. The usual silver image, toned or untoned, consists of so minute a quantity of metal that it offers insufficient resistance to the process of firing. The heat attacks the image so strongly that none but unsatisfactory results can be obtained. It is therefore preferred to produce the picture in material that will remain unaffected in the furnace, and which will give a pleasing and intense colour. These substances are metallic oxides, which, with a vitreous cement, the so-called flux, answer the purpose admirably, and are called enamel colours. The enamel colours, however, are not sensitive to light, and cannot be used for a direct printing process, nor for development, as bromide and chloride of silver may be, but they must be utilised by an indirect process. As the enamel colours are to be had in very fine powder, they are very suitable for the so-called powder process, which depends upon the properties of a bichromated gum or similar film. When such a film is exposed under a negative, those parts upon which light has acted lose wholly, or partially, their adhesive property. If a coloured powder is then dusted upon the film, those portions which have been wholly or partly protected from light hold the colour, and an exact negative picture is produced. By using a positive for making the print we obtain a positive image, and, if an enamel powder is dusted on, an image is produced which may be burnt into porcelain. This simple and certain method, known as the powder process, is therefore largely used for photo-ceramics.

If perfectly flat plates are used, the sensitive film may be coated directly upon the support, but a temporary glass plate may be used for the film, and, after printing and development, the picture may be transferred to the material upon which the picture is to be fired.

There are a large number of formulæ for preparing the sensitive film, but the following is distinguished by simplicity and novelty:—

### SOLUTION 1.

Fish glue .....	30 c.c.
Glucose .....	120 "
Glycerine .....	10 drops.
Water .....	300 c.c.

### SOLUTION 2.

Water .....	300 c.c.
Bichromate of ammonium .....	30 grammes.

Equal quantities of 1 and 2 are mixed together and filtered. A well-cleaned plate of glass, free from dust, is coated with a thin, even film, and dried over a spirit lamp.

The perfectly dry plate is warmed before printing, and a moderately dense positive, as free from blemishes as possible, is used. Exposure averages about fifteen minutes in diffused daylight, but it is, of course, impossible to state the exact time requisite. After printing, the plate is placed upon a piece of white card in a room where the atmosphere is rather moist, and development follows. The powder should be applied with a very soft, large, round brush, and distributed over the film with a circular motion. When sufficiently developed, the image should be vigorous and transparent. The superfluous powder should then be dusted off, and the picture coated with raw collodion, not too thick in character. When set, the film is cut through to the glass on three sides and the plate is immersed in clean water. The film will separate from the glass, excepting along the fourth side, and this will facilitate perfect washing. Clean water will suffice for washing, but a solution of borax is better; after washing, the film is transferred to the porcelain plate previously prepared to secure adhesion. A species of oil turpentine is used for the purpose. The plate may then be fired.

Instead of the bichromate powder process, the iron salts may be used for printing the picture. This process depends upon the fact that a film prepared with chloride of iron is not of itself adhesive, but it acquires this property by exposure to light. If such a film is exposed under a negative, chloride of iron is formed in the shadows, or under those parts which are more or less transparent, and, as those parts are hygroscopic, they well become tacky. If a powdery enamel colour is then dusted on, a positive picture is secured, which may be burnt in. The subsequent processes are the same as already described.

A third method for production of enamels depends largely upon the carbon process, and is also a bichromate process. Carbon pictures may be produced of the finest quality, and, as they can be developed upon plates of porcelain as a permanent support, the carbon process may be easily used for imitating enamels. It would therefore seem an easy step to substitute enamel colours for the ordinary carbon pigments, and thus obtain prints for enamelling; but, as gelatine presents difficulties in the firing, a mixture of gum and honey has been used instead for preparation



of the sensitive film, and it is probably extensively used at the present time. This medium is prepared by intimately mixing with it the enamel powder and adding the bichromate. The plates are coated and dried. A negative is used for printing, and the film is afterwards coated with collodion and immersed in water. After a short time the plate is taken out, and the collodion film is covered with a piece of moist paper and well pressed down. The film may then be lifted from the plate and developed upon the paper with warm water. It is finally transferred to porcelain. Gelatine may be substituted as a medium, the process remaining the same, and, after the picture is transferred (collodion film uppermost) and the paper removed, the film of collodion may be cleaned off by gentle rubbing with a wad moistened with acetic ether.

Photo-mechanical printing processes may also be used for the production of ceramic pictures, and they will be found of service where large quantities are required. Two different processes are available. The print may be made in the ordinary way upon a special transfer paper with a suitable ink. The colour is then dusted on. The paper, having been prepared with a collodion substratum, should be moistened and stripped off, and the picture supported upon the collodion film may then be transferred to porcelain prepared with adhesive medium and burnt in.

The following direct method may also be used:—

Paper or some other suitable material (metal, gelatine, celluloid) is prepared in such a manner that a film of collodion will not too readily strip off. The material is then coated with collodion and used for obtaining the print. The ink should consist of a suitable medium charged with very fine colour for ceramics. Iridium black, being of good covering quality, is much used for the purpose. After printing, the collodion film is stripped from the support and transferred to porcelain. Both processes are not equally suitable for the various printing methods if plucky, brilliant pictures are wanted. Consequently one must ascertain by experience which process suits best and work it according to circumstances.

The process, however, which the photographer will have readiest to hand for the production of photo-ceramic pictures, and with which he will, at the same time, be most familiar, is undoubtedly the substitution process. By its means a positive is produced by pure photography, without the use of enamel colours, and then transferred to porcelain and burnt in. It must not, however, be supposed that a photograph has simply to be transferred and then fired, which would be a great mistake. The ordinary silver image is far too delicate for the purpose, as silver in such fine division would not withstand the action of fire, and only yellowish-green traces of an image would remain. Platinum and iridium images are much more suitable for burning in, as they do not lose much of their vigour, and consequently give good results when the method is suitable.

As the direct production of platinum and iridium pictures for transfer does not seem very practicable, a different method is adopted for the purpose. A silver image is prepared in the usual manner, and converted into platinum or iridium by substitution. This may be done in two different ways, but only one of these is in general use. The positive silver image is produced in the camera by the wet-collodion process. A clear, vigorous image of pure reduced silver is obtained, that will leave nothing to be desired in respect to strength after the process of substitution. It is best to use a collodion that will yield a vigorous image by simple development without subsequent intensification, although this may be resorted to.

In order to replace the silver forming the image by one or other of the metals named, it is necessary to convert it into chloride or iodide. A five per cent. solution of mercuric chloride is best for the purpose, and with it the image is thoroughly bleached. This done, the plate is again washed, and immersed in the substitution bath. These baths resemble the ordinary toning baths, and usually contain some gold to improve the tone of the platinum or iridium. For instance, a fine purple-brown tone is obtained with the following gold and platinum bath:—

Potassium chloro-platinite.....	1 gramme.
Chloride of gold (1 in 60) .....	15 c.c.
Water .....	120 c.c.
Lactic acid .....	5 drops.

A warm black tone may be obtained with an iridium and gold bath according to the following formula:—

Iridium chloride .....	1 gramme.
Chloride of gold (1 in 60) .....	15 c.c.
Water .....	120 c.c.
Lactic acid .....	6 drops.

The toning should be continued until the whole of the silver is replaced by platinum or iridium, and the plate is then washed. The picture must be stripped from the glass for transfer, which may be done by cutting the film round the margins and immersing the plate in a weak solution of sulphuric acid, 8 c. c. of acid to the litre of water.

The stripped film is carefully washed, transferred to the porcelain, and dried. The collodion is then removed by application of a mixture of ether and alcohol. To burn in the picture it is necessary to dust the image with flux, whether the collodion be removed or not.

By the use of these well-known methods an entirely new direction has been proposed for photo-ceramics, but its attainment is beset with difficulties, compared with which those hitherto encountered are as nothing. It is in fact proposed that the process shall be used for the production of pictures in natural colours upon the principle of three-colour printing. Starting from the fact that a more or less good picture in natural colours may be produced by the exact superposition of three pictures in yellow, blue, and red, printed from specially prepared negatives, it is proposed that, by transferring and burning into porcelain three monochromatic images similarly prepared, a picture in natural colours may be obtained.

It is clear that the three necessary pictures may be produced in practice by different methods (the substitution process excepted). Probably the photo-mechanical process would be the simplest, as it would most readily permit of exact superposition of the three images; but, according to the statements of experts, the powder process, with a suitable bichromate film, is to be preferred. This requires three positives for obtaining the yellow, blue, and red prints. The negatives from which these positives are obtained must be made on suitable orthochromatic plates, and corresponding light-filters are indispensable. The operations are the same as for the three-colour printing process, and it is above all necessary to see that the colours used are in accord with the light filters. The prints are made in the usual manner, and the positives used are marked with transparent marks as a guide to superposition. The yellow image is first transferred and burnt in. When this is done, the blue image is transferred upon the former and burnt in, and finally the red. Supposing the negatives and positives are perfect, the effect will largely depend upon the transparency and covering power of the enamel colours. If they are wanting in transparency, the underlying colours will not have full effect, whilst excessive transparency would, under certain conditions, be inimical to the strength of the picture. From these considerations there should be wide scope for retouching. Retouching should be avoided as much as possible in the production of enamels, as it is far more difficult than in any other process. Consequently it is necessary to use perfect negatives and positives, also to avoid dust and to work with the utmost care.

The ceramic pictures are fired in muffled furnaces, in which a high, even temperature can be maintained. These furnaces are the most important and most costly articles in the whole process. They may be constructed in various ways, either fixed or movable. The fixed furnaces may be simply constructed with fire-clay, and heated with various kinds of fuel. The new furnaces, for work on a small scale, are movable and heated by gas, and, therefore, seem convenient and easy to use. Those of Fletcher, Russell, & Co., are well known. Coke furnaces can also be recommended. The firing requires care and plenty of experience. It is important that the requisite melting temperature should be maintained, otherwise it is impossible to enamel. A few minutes suffice to melt the colours, and the temperature should then be reduced, or the colours will lack brilliancy. The process of fusion is indicated by the matt colour of the image assuming a lustrous appearance and the surface of the plate looking as though covered with water. The colour of the picture may pass through various shades, but at last takes on its final tone.

The many purposes to which photo-ceramics may be applied, and the permanent and brilliant results which may be obtained, should be recommendations for greater attention to this neglected branch of photographic art. Doubtless there are many difficulties in the way, but the times are gone for anything to be earned in photography without some trouble. In all the fields of our art, which are easily cultivated, there is the keenest competition, and many small professionals are compelled to resort to other subsidiary employments to obtain a living, even if there is no connexion between it and photography.

From these and other considerations it is desirable to acquire some knowledge of photo-ceramic work. It may some day become fashionable, and then will be the time to profit by it; but this will only be possible to those who are familiar with the process.

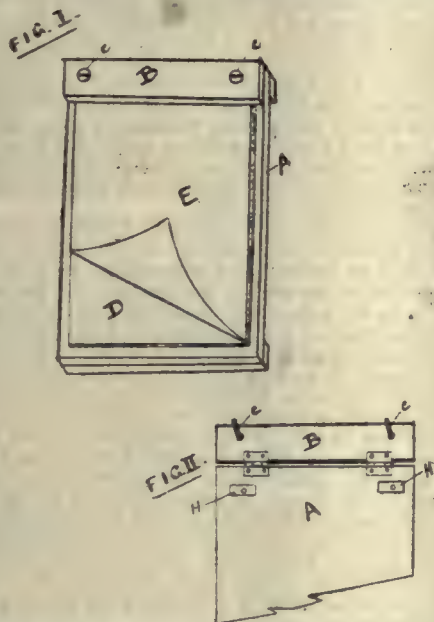
J. VON NOBATH.



## PARSON'S SQUEEGEEING AND MOUNTING BOARD.

THIS apparatus, in its simplest form, consists of a base of wood or other suitable material, to which is attached, by one end, sheets of absorbent material, as blotting-paper, and over the said sheets a sheet of rubber cloth or other suitable material to resist the strain of the squeegee on the said absorbent sheets; thus the whole of the sheets are left free from one end, like leaves of a book, so that the photographic prints, or other articles to be operated upon, may be inserted between the said sheets, leaving both hands free for the operation of squeegeeing.

The baseboard, A (figs. 1 and 2), may be clamped or battened as shown,



and the sheets attached by means of a piece of wood or other suitable material, B, either permanently or in such a manner as to be easily renewed. In the latter case the strip, B, may be hinged, as shown in fig. 2, and the screws, C, C, passed through the trip and screwed into the baseboard, A, or into plates, H, H, secured to the baseboard. The said strip, B, may be unhinged, if desirable, and simply secured by the screws, C, C, or other suitable means.

When the strip, B, is clamped by the screws, C, C, it will clamp the sheets, D and E, securely to the baseboard, A.

## INTRODUCTION TO THE ALMANAC OF 2000.

THERE is nothing to justify a retrospective review of work and progress at the end of a century more than at any odd time within it. As it is, however, a conventional usage of long standing and wide vogue, and in itself, apart from all question of the time of doing, a useful and an agreeable one, we avail ourselves of the custom, and, in place of running back, as usual, simply the length of the past year, propose, in offering to our numerous friends the Year-Book of 2000, indicating more broadly some of the points of advance of the last 100 years. These are so many in number, and so marked in character, that not only would it be out of the question within the compass of one article to describe them all, but the field offers, in addition, such a revolutionary variety, running throughout the whole domain of photography, that it proves equally difficult to present them in anything of a detailed and rational order. To the better gaining of some measure of definiteness, it is therefore proposed to note only the chief advances, and to do so whilst roughly describing the procedure in taking a photograph by the departed worthies and pioneers of 100 years ago.

At that time, as most of our readers who take anything of historical interest in the art will know, a camera was necessary to the taking of a photograph, the camera being in essentials merely a light-tight box, although modified in several ingenious ways to save weight and bulk, and having about it many mechanical accessories in the shape of screws, racks, and so on, for greater convenience in using under varied conditions. In the front of this camera a lens was fitted, the rear end having a ground-glass screen, upon which the image formed by the lens was thrown for the purpose of focussing and detailed examination. When a picture—a "negative"—it was called in those days, the simple method of reversal discovered by Simpson Howard in 1827, by which the positive is directly produced, not being, of course, known—had to be taken, the ground-glass screen referred to was swung to one side, and a chemically coated glass or celluloid plate, ingeniously protected from light in a slide,

introduced into the place and plane occupied by it. A withdrawal of the protecting front of the slide, and an uncapping of the lens, resulted in an impression upon the film on the face of the plate of what it was desired to take. This was, however, not a visible, even negative, impression, but what was termed a "latent image"—most authorities of weight being now agreed that the term was thus applied to an, as yet, invisible picture, rather than in the alternative way sometimes suggested as applying to the image as one hidden or "latent," except in the so-called "dark room," and until after certain operations therein subsequently conducted had made it practicable to expose it to ordinary light. What these operations were, as well as the construction and arrangement of the dark room itself, we, fortunately, are able pretty clearly to get at through various copies of old books of instruction by bygone writers, notably one written by a Captain Abney, affording incidental proof by the way, in the title of the author, that the Government even of that day had begun to acknowledge the importance of photography as a help in warlike operations.

We would particularly recommend our younger readers, a little too prone to grumble at the very slight trouble necessary nowadays in taking a photograph, to consult one or other of these old-fashioned books, that they may to their added pleasure realise the lengths of discomfort and pains their earlier predecessors in the practice of the art had to go to. Coated plates being sensitive in an extreme degree to any light other than a non-actinic one (and even in a measure to that if it were in any way powerful), all operations had to be carried out in a room—the dark room—into which ruby-coloured light only was very sparingly admitted; and slides had to be filled, or the camera, in the event of it taking an alternative form of a magazine one, loaded, by this glow-worm style of illumination. After exposures had been made, the plates were again carried into this dismal holy of holies, and there "developed," that is, solutions of various kinds, made up mainly from empiric formulæ, were dashed over them, until the "latent" image, by chemical reactions in the film, was made visible. Yet, before door or window shutter could be opened, a further process of "fixing," or making the image permanent, had to be gone through by soaking in other solutions. Finally, well washed and dried, from the resulting monochrome negative, positive prints upon paper were produced by a crude process of contact printing, the prints themselves again undergoing in turn, before completion, processes of development, toning, fixing, and washing, as tedious and complicated as those of the mother plates.

How different is the procedure nowadays when all needed is a simple lens sliding upon a walking-stick, with a block, or book, of papers fixed in a catch at its one end. What would the old-time photographer, if privileged to revisit the scenes of his earthly labour, think of the simplicity of the process that in merely filling a hollow lens with a prepared liquid, and correspondingly preparing the paper, would admit of the possibility of instantaneously impressing upon it, at the moment of sharp focussing, a positive picture in natural colours! And this in the full eye of day, by simply sliding a lens along a rod base! Yet this has long been a commonplace; ever since the adaptation in the early forties of the classical discoveries of Professor Leslie, of Glasgow, upon the full ratios of conjugate foci.

Or what would he think, further, of the practicability of ordinary indoor work, and of photography by night? Not by his crude flashlight with its sudden and disconcerting tongue of flame—there is a good example of this flash lamp, we may add for the benefit of the curious, in Section D, Room E of the South Kensington Museum—but by the soft glow of the mica-encased actino-electric light. It is only when one remembers that, although the electric light in a rough, tentative way was being gradually introduced, yet that the light generally used at that date was gained by burning coal gas conveyed into dwelling-houses in leaden pipes, and that this gas was in turn set fire to by the still cruder expedient of scraping a phosphorus-tipped stick against a piece of sand paper to catch a spark, that the extent of our progress can to a degree be realised. The idea of dividing out white light into its component parts, and using each in a concentrated form for the particular purpose it was best suited for, did not take any commercial practical form until forty years back. We are naturally and excusably proud of the progress made in this domain of light, of such first importance to us as photographers; yet it would be premature to indulge in too deep congratulation at having reached a highest point, particularly in view of the startling, though as yet incomplete, statements that have reached us of the experiments of Goldwin Smith upon phosphorescence in the physical research laboratory of the Toronto University.

But to return to our more immediate field of photography, and what has been actually accomplished in it. One of the leading discoveries of the century, without doubt, is that of distant photography, due to the investigations by Professor Schlichter, of Heidelberg, of Hertzian rays, and their bearing upon telegraphy and tele-photography. Very hard it must have proved in older days for parents saying good-bye to sons and daughters, intent upon the freer life and lessened strain of competition in the colonies, to be denied all communication with them except through the then only reasonably practicable one of a letter a month; equally hard for the wanderers to be so completely out off from the beloved home life. Nowadays, not only can the distant Canadian or Australian farmer son or daughter communicate as readily with parents



and friends as though they were still at home, but, at the added cost of apparatus costing but a few shillings, be able to have continuous pictures at either end upon the tele-photoscopic screen of what is going on at the other. This is advance not merely to be coldly proud of as a scientific accomplishment, but to be genuinely and warmly grateful for, as reaching to the deeper realm of sentiment lying so much nearer the heart.

An advance equally marked, and with which we must conclude—reluctantly so, the subject being so pleasingly engrossing a one—is that of the marvellous development of the Röntgen rays. It was little thought, we would naturally presume, that the simple “radiographs,” or partial shadows, of the bones of the hand, first brought into the notice of a wondering world by Professor Röntgen at the close of the last century, would have developed out into so important a matter as it has. The first point to be gained was the possibility of using a lens to form a true and proportionate image; the second, a shortening of the time of exposure. The use of a material, or mixture of materials, other than glass, that would act upon the Röntgen rays as glass does upon those of ordinary light, accomplished the former object, and an isolation and concentration of the true rays the latter. What the result, combined with a further cinematographic amplification, has been, can be seen in very many directions, but more particularly as an aid to the doctor. It seems hardly credible that so short a time back as thirty years, the chief guide of the doctor in diagnosing disease in such main organs as the heart and lungs was a wooden tube with a bell-shaped expansion at each end, one of which was pressed upon the region to be examined, and the ear applied to the other to catch the sound of pulsation and movement—very much like guessing, as it were, of the life in a house by listening with the ear against a closed front door! The stethoscope has, of course, long gone out of use, and it would be a very poor consulting-room that did not possess the necessary apparatus for taking actual pictures for any desired length of time of the action of any one, or the whole, of the organs going to the making up of one's internal economy. What a bearing this has had upon remedial medicine may be gauged by a hundred different facts, not the least significant being possibly the present easy curability of consumption and angina pectoris, and the lowering of the general death rate during the last twenty years by 15·8 per cent., as shown by the last official returns.

As there is, however, no gain humanly possible without a something *per contra* to be paid, the possibility of so easily photographing private life from the streets through the house walls must be regarded as such a one in this case. Our forefathers saw great humour in the remark of Sam Weller, when he said at the trial that he “could hardly be expected to see Mrs. Bardell in Mr. Pickwick's arms through a flight of stairs and a deal door;” to us the humour is in a great measure lost in its being so easy to see through far more material obstructions. Still any such violating of private life we must very much deprecate, and it is a source of considerable satisfaction to us, and those who think with us, that an anti-Röntgen paint has been recently put upon the market, at a price well within the reach of all, a thin coating of which has, so far, proved an impenetrative protection to all within a single coating of it. This, however, is a minor side issue, suffice it that the general gain infinitely outweighs any particular loss.

The foregoing is felt to be only too brief and inadequate a reference to the mighty progress made by photography in the term of years taken into consideration; but, if it serve to direct attention to the more marked lines of progress, and thus stimulate more particular inquiry, to result in yet further advance, it will not have been penned in vain. JOHN REES.

#### PHOTOGRAPHIC PAPER.

THE action of MESSRS. Blanchet Frères, makers of the celebrated Rives paper, and MESSRS. Steinbach, manufacturers of the equally celebrated Saxe paper, in forming a coalition, and doubling the price of their respective papers, has drawn the attention of the photographic world to the mistake of leaving such an important photographic article as paper practically in the hands of these two firms, as, although Messrs. Ernest Colby, of Zwickau, have not joined them, the latter firm are hardly able to cope with the increased demand necessary to shut out the other two, which up to now have done the bulk of the trade.

In the days when albumen held almost supreme sway, these papers took the lead by reason of the composition of their sizing exercising a peculiar and most generally admired effect in the subsequent print, thus displacing many English papers which were very much used years ago; but, now that emulsion papers have come so largely to the front, the necessity of studying the sizing of the papers has gone, for these classes of papers at least, as the raw paper is enamelled with an emulsion of sulphate of baryta in a solution of gelatine; consequently the sizing of the paper cannot affect the tone and colour of the print, and there is not the slightest reason why English papers should not be used, so long as they are chemically pure. Fortunately we have a number of English papers which are quite pure, and we have also a number of firms who make a special business of enamelling paper, so there should not be the slightest difficulty in placing an English-made and enamelled paper upon the market. The necessity of enamelling the paper first is

accounted for by the fact that, were the emulsions to be poured directly on to the raw paper, they would sink right in and all definition and surface would be lost.

For albumenised paper, all that would be required is to study the sizing of the paper and make it similar to that upon the Rives and Saxe papers, which are starch-sized, where most of the English papers are sized with gelatine.

At the present time the Rives paper is made at the town of that name in France, then sent to Germany to be enamelled, and, as a large quantity of it is afterwards sent to England, the waste of time and money in travelling, &c., needs no comment.

Hardwich, in his *Photographic Chemistry*, mentions the following English papers as being pure, and suitable for printing out purposes, viz., Hollingworth's thin, Towgood's, and Evans's, of Nash Mills, Hemel Hempstead. These mills are still in existence (the latter now belonging to Messrs. J. Dickinson & Co.), and presumably could supply the paper. More recently Woodbury, in his *Gelatino-chloride of Silver Printing*, advocates Arnold's special unbleached, Whatman's thin, and Pirie's. Whatman's has been used lately, to a certain extent, for bromide work.

The paper should be composed of rags preferably, although the better kinds of esparto grass might possibly answer, wood pulp, by reason of its tendency to yellowness, being inadmissible.

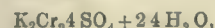
The principal impurities likely to be met with in paper are: chlorine, from the chloride of lime used in bleaching the raw material, hyposulphite of soda, which is used as an antichlor, and metallic particles. Papers containing the two former are useless for photographic purposes; the latter are met with in all papers to a greater or lesser extent, even in Rives and Saxe, their presence being indicated by black spots when the paper is sensitised, causing a large amount of waste. For this reason metal rollers ought not to be used in the manufacture or enamelling of the paper, their place being taken by hardened paper-pulp rollers.

The German baryta paper is supplied in glossy, and matt (as it is called) or rough surfaces, in rolls, either by weight or measure, the usual size being 1000 metres long, or 100 kilogrammes in weight, and must be twenty-six and thirty-five inches wide, the former being the most generally used width; the length is immaterial, but the width must be strictly adhered to, as the sizes of the finished paper and likewise the machinery by which they are coated, &c., are based upon this width. The paper is also supplied with mauve, pink, and white surfaces, the colour being obtained by dyeing the baryta emulsions to the required shade, with a fast and direct (as it is known in the colour trade) dye, before enamelling the paper.

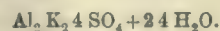
It is, of course, necessary that the paper should be turned out with the enamel as nearly uniform as possible, for this is one of the great defects in the present German papers, and, unless the enamelled paper is uniform, it is practically impossible to make the sensitised paper so.

It is also absolutely necessary that the baryta enamel should be chemically pure as well as the paper, as it is upon this that the emulsion depends, to a large extent, for permanency. Some experiments which were tried with collodio-chloride upon British enamelled paper show the necessity for a perfectly pure enamel; in one case the sensitised paper turned blue in less than twelve hours in the dark; still, these papers are of very good quality and surface, and all that seems necessary is that, for photographic emulsion work, all the ingredients of paper and enamel shall be perfectly pure, and, instead of being calendered with hot metal rollers, paper-pulp ones shall be used, and the polishing be done with rapidly revolving brushes.

The enamel for collodio-chloride and gelatino-chloride varies slightly, the gelatine substratum for the latter process requiring to be hardened somewhat to prevent the warm emulsion from sinking into it, which, of course, is not necessary with collodio-chloride, as ether-alcohol does not affect gelatine in the dry state. The hardening is accomplished by adding to the baryta emulsion either common alum, chrome alum, or formaldehyde, commonly sold as formalin, the latter being the best, as chrome alum gives a somewhat greenish tinge to the emulsion, and contains a large amount of sulphur, which is a very undesirable item, the respective formulae of chrome alum reading:—



and common or potash alum,



A section of the German press has lately made accusations of yellowing and fading against collodio-chloride, but, as was recently mentioned in THE BRITISH JOURNAL OF PHOTOGRAPHY, this has not been found to be the case in England, for the general experience has been that it is practically permanent, even under unfavourable conditions. The afore-mentioned article lays the blame upon the baryta paper, probably due to impure materials, the writer of the article trying three baryta papers enamelled by a like number of different firms, with three dissimilar results. Still, it is a fact known to chemists that baryta, under some conditions, is liable to turn yellowish-brown by the action of ether-alcohol. This might account for the yellowing, but not for the fading, and suggests the employment of some other substance, such as kaolin, instead of baryta, for the enamel, though, on the other hand, it is said by some chemists that baryta, although imperfect, is the best known substratum for



these papers. The fading mentioned is almost sure to be due to some impurity in the baryta emulsion.

Photography has become considerably more than a mere amusement or scientific recreation, and is a necessary adjunct of business life, playing, as it does, an important part in many trades and professions, where copies of machinery, houses, &c., are required, and there is always a constant demand for the paper, the business done in enamelled paper alone in England running into many thousands of pounds annually for photography only, besides large quantities being used for collotype and the better class of printing; so there is no question of there not being a demand for it, and any English maker placing such a paper upon the market need not be afraid of being unable to find customers, even at the same price as the German enamelled papers, as at the present time it takes from three to six weeks to obtain them from Germany, and sometimes even this period is exceeded, so that, should English manufacturers of emulsion papers experience an exceptional demand, and their supply of enamelled paper from some unforeseen reason give out, their predicament may be more easily imagined than described. I may mention that such circumstances have arisen more than once, so that I have no hesitation in saying that English photographic-paper manufacturers would gladly welcome an English-manufactured and enamelled paper, even if it meant no saving of money upon the paper, for the convenience and security of being able to obtain it when wanted.

The drawback possibly experienced by English firms who would, perhaps, manufacture the paper may be accounted for by the fact that they are unable to get reliable information as to the requirements of the trade; that is a difficulty easily got over, for what is possible in Germany should be, and could be, possible in England. It is a very strange thing that the paper support for collodio chloride, and gelatino chloride (both of which are English inventions) should have been allowed to be entirely produced, if not invented, by Germans; but, unfortunately it is an acknowledged fact that English manufacturers are very often slow to recognise requirements which are perhaps a little outside the usual run of their business, and even the albumenising has been largely allowed to fall into German hands; but, should English paper-manufacturers read the English photographic trade journals, as no doubt many of them do, they should be able to see by the articles which have recently appeared in these papers, and notably those in *THE BRITISH JOURNAL OF PHOTOGRAPHY*, that there is a large and lucrative business to be done by them in photographic paper, as this coalition has upset, not only England, but Germany and other parts of the Continent as well. Messrs. Schoeller & Schering have grappled with the subject in Germany already, and it is to be hoped, for the sake of English photography and English commerce, that some English firm will take the matter up, keeping money and employment in the country, and relieving photography of a monopoly which has badly abused it. Even evils sometimes have their good side, and, should this very desirable consummation become an accomplished fact, the German-French "corner" will not have been formed in vain.

C. T. SUTTON.

#### GOLD TONING WITH SULPHOCYANIDE FOR AMATEURS.

Among the many arithmetical puzzles with which the photographer is confronted there is hardly a more difficult one than that of realising the real meaning of the chaotic formulæ given by different makers for the simple process of toning.

I have studied the directions sent out with different brands of paper, and have endeavoured to arrange hints for the preparation of the bath in comprehensible terms.

#### SOLUTIONS.

**Gold.**—Break a tube of gold chloride (1 gramme) into 100 c. c. of water.—Result, a 1 per cent. stock solution. Take 1 part stock and 9 parts water, obtaining a 1 per 1000 mixture for use. 100 c. c. in a small bottle is a convenient quantity to prepare at once.

**Sulphocyanide.**—Place 10 grammes of sulphocyanide in a foreign medicinal water bottle, and 1 litre (1000 c. c.) of water for 1 per cent. stock. In a similar bottle dilute 100 c. c. of stock with 900 c. c. of water, thus obtaining a 1 per 1000 solution.

For each quarter-plate print take the quantities named in the table opposite the selected colour, and for other sizes and quantities of paper in like proportion.

Colour.	Gold chloride, 1 per 1000	Sulphocyanide, 1 per 1000.
	c. c.	c. c.
Red .....	·7	7
Reddish brown .....	1·0	10
Brown .....	1·5	15
Warm purple brown .....	2·0	20
Cold purple brown .....	2·5	25
Cold purple black .....	5·0	50

Add as much water as is necessary for easy manipulation.

Until experience is gained it is best to make a bath of sufficient materials to tone a single print in one dish, and exhaust the gold with it. Personally, I do not find that any saving in time is effected by operating on more than one print at a time.

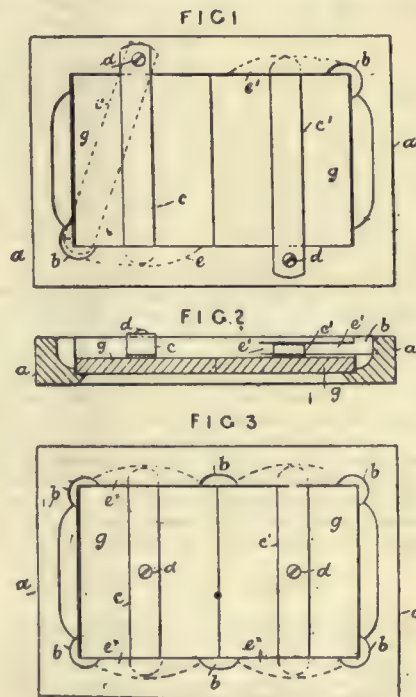
For fixing, use one part saturated solution of hypo and two parts water.

Weighing hypo is a needless refinement. For plates use one part each of saturated solution of hypo and water.

C. L. HETT.

#### WILKINSON'S PRINTING FRAME.

MESSRS. WILKINSON say: In a photographic printing frame as *a*, we form semicircular recesses, *b*, preferably at opposite corners, as shown in fig. 1. We secure one end of each of the pressure springs, *c*, and *c*<sup>1</sup>, to one of the sides of the frame by means of a stud, *d*, so that said springs may swivel, the free end of each spring being retained in a groove, *e* or *e*<sup>1</sup>, formed in the interior edge of the opposite side of the frame. In order to insert the free ends of the aforesaid pressure springs into the grooves, *e* or *e*<sup>1</sup>, said free ends are pressed down the semicircular recesses, *b*, and



passed into the grooves, *e* or *e*<sup>1</sup>, respectively. When the ends of the springs are required to be withdrawn from the aforesaid grooves, *e* or *e*<sup>1</sup>, they are pressed round until they come to the semicircular recesses, *b*, as indicated by dotted lines in fig. 1, when they will rise and release the flap, *g*. In a modification of our invention, shown in fig. 3, the compression springs, *c* and *c*<sup>1</sup>, are pivoted in the centre, and semicircular recesses, *b*, are cut in each corner and at or near the centre of the inner side of the frame, each of the ends of said springs being retained in the grooves, *e*<sup>x</sup>, and can be removed in the manner before described.

#### THE MEASUREMENT OF ATMOSPHERIC ACTINISM.

[Abstract Translation from *Chemiker Zeitung*.]

THE importance of the systematic registration of the actinic value of daylight under the varying conditions of climate is a question upon which most photographers will be agreed. The abstract of a paper on this subject, read before the Chemical Association of Christiania by Professor John Sebelien, appeared in the issue of the *Chemiker Zeitung* for November 2, and is worth more than passing attention. The author criticises the various types of actinometer which have been proposed for measuring the actinic intensity of daylight, from the hydrogen and chlorine actinometer of Draper, introduced in 1843, down to instruments of more recent date. Draper's instrument, even when greatly improved by Bünsen and Roscoe, had the defect of the glass tube (in which the gases were contained) absorbing some of the ultra-violet rays, whilst the exothermic character of the reaction was an additional source of error. Far simpler in use, and just as accurate in results, was the use of chloride of silver paper, prepared according to the standard directions of Bunsen. After describing Wiesner's method, which was a simplification of the methods involving the use of a pendulum photometer, the author stated that, in conjunction with P. Solleid, he had been studying photo-chemical



variations in Norway, using a method due to the combined researches of Eder and Wiesner, which gave a number of isolated tests of the actinic energy. In order to obtain an estimate of the total action throughout a long period, such as a day or year, the figures bounded by the curves obtained were drawn on stiff, homogeneous paper, cut out, and the paper weighed. This gave results which were sufficiently accurate. For making estimation of photo-chemical intensity over a considerable period the scale photometer of Vogel would be suitable were it not liable to errors which, in the opinion of the author, are not easily avoided; the result obtained by exposure to a whole day's radiation does not agree with that obtained if the exposure were divided into hourly, two-hourly, or even half-daily intervals. It was preferable to use for these purposes solutions which underwent chemical change on exposure to light. The photo-decomposition of chlorine water into hydrochloric acid and oxygen (discovered by Berthollet over 100 years ago) had been used by Saussure for actinometric measurement, but, like the photo-decomposition of solution of potassium iodide, had not been used nearly so widely as the alteration in light of oxalic acid solution or oxalate in some form or other. Duclaux had used a vingti-normal solution of oxalic acid for taking actinometric observations in various parts of France and Africa, but the author's experience of the method was that it was not very sensitive. In some recent experiments he had made he found that the strength of 50 c.c. of N 20 oxalic acid solution, when exposed in glass flasks, 10 cm. in depth, for one or two days, scarcely altered, whilst under the same circumstances Wiesner's and Eder's methods gave a high photo-chemical intensity. Marchand's method of using the oxalic acid in the form of iron salt, was open to the objection that the effect of temperature and gradual concentration is not known, whilst the colour of the solution alters during the progress of the reaction. Since the commencement of the present year the author has used Eder's solution of ammonium oxalate and mercuric chloride for daily estimations of chemical intensity at the Agricultural High School of Aas, near Christiania.

The solution decomposes in a similar manner to oxalic acid, but with separation of the mercury, as mercurous chloride. The precipitate which separates in the course of a given exposure was collected on a dried filter and weighed. By means of Eder's tables, corrections for the temperature and change of concentration can be applied. By changing the flasks from hour to hour, the daily periods of intensity can be estimated by Eder's solution; and from these figures the author shows that the photo-chemical intensity bears no direct relation to the duration of sunshine or the clearness of the sky, nor in general to the usual meteorological factors. It was remarkable—and the fact is of great interest to the landscape photographer—that this recorded intensity reached a maximum in March, on a day when the sky was clouded and snow and rain fell, whilst some days previously, in far clearer weather and with bright sunshine, the photo-chemical intensity was much smaller.

### GRAINING BLOCKS FOR PHOTO-MECHANICAL PRINTING.

Mr. PITMAN's invention relates to an improved method of and means for producing "originals" for use in preparing blocks suitable for printing.

In ordinary "block" printing it has hitherto been difficult to produce "half-tone" effects. The object of the present invention is to render such effects easy of attainment, and in an economical manner.

In the production of an "original" according to my improved method, says Mr. Pitman, I prepare a mould having an inner face composed of a number of minute pyramids, same being produced by means of V-shaped parallel grooves arranged in two series, the one crossing the other at right angles, or thereabouts. With the aid of this mould I form a plate composed of a black substance, such as a mixture of wax with black lead; the surface of the plate consisting of a number of minute pyramids corresponding with the inner surface of the mould. The serrated surface of the plate is then served with a coating of a white substance, such as plaster of Paris, the thickness of the coating being sufficient to entirely fill the V-shaped grooves.

The serrated surface may also be produced by scoring the face of the plate, or by means of pressure, or with the aid of rolls having serrated surfaces.

Upon the coating becoming set, the plate is ready for the reception of the design, which may be etched or otherwise depicted thereon in pencil or other material.

By scraping, dissolving, or otherwise reducing the coating to a greater or less depth, according to the nature of the design, the apices of the pyramids become apparent, and impart to the surface so reduced a minutely speckled appearance, amounting to a "half-tone" effect. If the reducing process be continued, more of the black substance and less of the white coating becomes visible as the pyramids become more blunted, the result being a deeper "tone."

It will be readily perceived that the design is produced in a series of minute black spots or specks on a white ground, these specks varying in size and in distance apart according to the severity of the reduction process, half-tone and deep shadow effects being thus obtained.

The plate with serrated surface may be formed of the white substance, and the coating may be composed of the black substance, in which case

the scraping or reduction process would bring into view the high lights, instead of the shadows.

Having obtained the original as above described, the printing block may be prepared therefrom by means of photography according to any of the methods usually practised.

## Our Editorial Table.

THE CADETT "SAFE LIGHT."

Cadett & Neall, Ashted, Surrey.

We have received from Messrs. Cadett & Neall one of their safe lights, the use of which, it is pointed out, is a *sine-quâ-non* with the Spectrum plates, unless the latter are manipulated in total darkness. We gather that the demand for the Spectrum plates is largely on the increase, and it is anticipated that that demand will be further augmented by the introduction of these safe lights. Each safe light, which, visually, is a very deep red, produced by a mixture of differently coloured glasses, is spectroscopically tested before it is sent out from Messrs. Cadett's works. It is certainly a step forward in the niceties of practical working when the makers of colour correct plates indicate with precision the light in which those plates may be manipulated.

THE CADETT P.O.P.

Cadett & Neall, Ashted, Surrey.

A NEW gelatino-chloride printing-out paper, made in three tints, mauve, pink, and white, has just been put on the market by Messrs. Cadett & Neall. We hope to have an early opportunity of striking some prints on this paper, the latest production of the energetic Ashted house. In the meanwhile, an examination of the samples submitted to us show the paper to have been well and carefully prepared. We append the working instructions for it:—

Print a shade darker than is required in the finished print.

Before toning, wash well for ten minutes in running water; be careful to put the prints separately into the water.

If necessary, in hot weather, the prints may be soaked for a few minutes in a five per cent. solution of alum, after which they should be again washed in running water for ten minutes.

Toning Bath.—Stock solution of gold: Break a 15 grain tube of gold chloride in a stoppered bottle; add 15 drachms of distilled or boiled water. Take of

Ammonium sulphocyanide .....	35 grains.
Water, distilled or boiled .....	20 ounces.
Stock solution of gold .....	2½ drachms.

After toning, wash for a few minutes, and fix in bath of hypo containing 4 ounces of hypo to 20 ounces of water; leave the prints for about ten minutes in the fixing bath.

After fixing, wash well in running water for about an hour. On no account leave the prints in still water.

### LE DÉVELOPPEMENT DE L'IMAGE LATENTE EN PHOTOGRAPHIE.

A. SEYEWETZ: Gautier-Villars, Quai des Grands-Augustins, 55, Paris.

THE work of M. Seyewetz will be of much use to the photographic student who wishes to become acquainted with the chemical aspect of the problem of development. It treats of the old and the modern developers and discusses their merits and defects. Amidst the confusion of ideas concerning the advantages of many recent introductions, the following quotation is worthy of note: "Pyrogallie acid in presence of acetone and sulphite of soda, diamidophenol, diamidoresorcin, and paramidophenol are types of developers difficult to surpass, according to our opinion, and they possess substantial advantages in comparison with others. The only new developers that are likely to supplant the old, are those that might supplement in a certain measure the action of light and, thus facilitate the development of an under-exposed plate. Unfortunately, there seems to be no prospect of attaining this result at present, as we have shown that, however energetic the reducing power of the developer, they all produce rigorously the same amount of detail if the exposures are identical."

### LEHRBUCH DER PHOTOGRAPHISCHEN CHEMIE UND PHOTOCHEMIE.

By ALEXANDER LAINER.

R. Lechner. K. & K. Hof und Universitäts-Buchhandlung, Vienna.

This work forms Volume VI. of Lechner's Photographic Library, and deals with the methane derivatives. It has been compiled with considerable care, and will, doubtless, become a standard work of reference. The uses of the various compounds in photography are very completely described.

PERHAPS the most favourable thing we can say of the *Photographer's Pocket Diary* for 1899 is that we intend making daily use throughout the year of the copy that has been sent us for review. The diary is, as



hitherto, compiled by Mr. E. J. Wall, who has condensed a great deal of valuable information into the little book, which contains the usual diary spaces, blanks for recording exposures, and so forth. It is published by Messrs. Charles Letts & Co., 22, and 24, Tabernacle-street, E.C.

THE *Entrevue Annual* for 1899, edited by Mr. W. H. Combes, and published at 6, Catherine-street, Strand, is full of clever caricatures by Mr. Alfred Bryan and stories and verses by well-known writers. The *Annual* appeals to everybody interested in stage and music-hall matters—a very large public.

#### RECENTLY ELECTED OFFICERS OF SOCIETIES.

(Received too late for the ALMANAC.)

**AUCKLAND PHOTOGRAPHIC CLUB.**—Established 1885. Meetings held at the Club Rooms, Grey-street. *President:* Dr. J. Logan Campbell. *Vice-Presidents:* Messrs. J. R. Hanna, J. Martin, and E. A. Payton. *Treasurer:* Mr. W. Gatenby. *Secretary:* Mr. H. R. Arthur, c/o Auckland Gas Company, Limited, Wyndham-street.

**CAPE TOWN PHOTOGRAPHIC CLUB.**—*Hon. President:* Dr. Gill, C.B., F.R.S. *Vice-President:* Dr. Muir. *Committee:* Messrs. T. H. Watson, A. Gracie, G. Ainslie, J. Denham, E. J. Steer, A. McLeod, A. J. Fuller, and J. P. Edwards. *Hon. Secretary and Treasurer:* Mr. H. Bishop.

**DOVER PHOTOGRAPHIC SOCIETY.**—*President:* Rev. Turberville Evans. *Committee:* Captain Gordon McDakin, Messrs. Mowbray Gray, H. Peake, and J. J. Goulden. *Treasurer:* Mr. R. M. Ewell. *Hon. Secretary:* Lieut.-Colonel Cockburn Curtis, 21, Leyburn-terrace.

**DUNEDIN PHOTOGRAPHIC SOCIETY.**—Established 1870. Meetings are held at the Rooms, Liverpool-street, Dunedin. *President:* Mr. C. W. Kerr. *Vice-Presidents:* Messrs. A. Hamilton and R. A. Ewing. *Committee:* Mr. W. Williams, J. C. Thomson, A. J. Barth, F. J. Monnon, G. Crichton, and P. Laine. *Secretary and Treasurer:* Mr. J. Skottowe Webb, c/o National Insurance Company, Dunedin, New Zealand. *Recording Secretary:* Mr. W. Livingstone.

**GLASGOW PHOTOGRAPHIC ASSOCIATION.**—Established 1862. Meetings held in the Philosophical Society's Rooms, 207, Bath-street, Glasgow. *President:* Mr. John Stuart. *Vice-Presidents:* Messrs. William Lang, F.C.S., and J. Craig Annan. *Council:* Messrs. Robert Dodd, J. E. Hanbidge, George Mason, A. Lindsay Miller, J. C. Oliver, and Archibald Watson. *Treasurer:* Mr. George Bell. *Secretary:* Mr. Charles Macdonald, 100, West Regent-street, Glasgow.

**HAND-CAMERA POSTAL CLUB.**—Established 1898. The object of the Club is to encourage the use of the hand camera as an instrument of pictorial work. *Hon. Secretary:* Mr. P. E. Bradshaw, 12, Victoria-parade, Ramsgate.

**HAWKES BAY CAMERA CLUB.**—Established 1895. Meetings are held at the Club Room, Regent-street, Napier. *President:* Dr. A. Milne-Thomson. *Vice-President:* Mr. F. Nelson. *Committee:* Messrs. T. B. Bear, S. E. Cooper, H. W. Harrington, A. A. Kennedy, J. K. Newton, and F. J. Shanly. *Treasurer:* Mr. G. Nelson Pierce. *Secretary:* Mr. W. Beswick, C.P.O.

**ISLE OF THANET PHOTOGRAPHIC SOCIETY.**—Affiliated to the Royal Photographic Society of Great Britain. *President:* Rev. Canon H. Bartram, M.A. *Vice-Presidents:* Rev. C. E. Eastgate, M.A., Rev. W. E. Allen, M.A., Messrs. G. Dowker, F.G.S., and J. H. Forwalk, F.R.H.S. *Committee:* Messrs. E. Deacon, A. D. Sackett, J. Savage, C. J. Scott, P. Solly, and A. Vizar. *Hon. Lanternist:* Mr. J. H. Forwalk. *Assistant Lanternist:* Mr. E. Deacon. *Hon. Librarian:* Mr. B. Barnett. *Delegate to the Royal Photographic Society:* Mr. J. C. Goldsack. *Hon. Secretary and Treasurer:* Mr. J. C. Goldsack, Llanberis, Grove-road, Ramsgate.

**NORTHERN TASMANIA CAMERA CLUB.**—Established 1889. Meetings held at the Club Room, Albert Hall, Launceston, Tasmania. *President:* Mr. William Gibson. *Vice-Presidents:* Messrs. F. C. Birchall, R. C. Kermode, and W. H. Twelveteens. *Committee:* Messrs. H. B. Brownrigg, R. Lewis Parker, and John Sparrow. *Secretary and Treasurer:* Mr. F. Styant-Browne, 112, Brisbane-street, Launceston, Tasmania.

**N.S.W. RAILWAY AND TRAMWAY CAMERA CLUB.**—Established 1894. Meetings held at the Railway Institute, Sydney, N.S.W. *President:* Mr. H. McLachlan. *Vice-President:* Mr. H. Carruthers. *Committee:* Messrs. F. Peterson, T. Marsh, C. S. Robins, and A. J. Leslie. *Treasurer:* Mr. J. Paterson. *Secretary:* Mr. J. Scouler, Railway Institute, Sydney, N.S.W.

**OLDHAM PHOTOGRAPHIC SOCIETY.**—Established 1887. *President:* Mr. W. A. Nash. *Vice-President:* Mr. R. T. Taylor. *Committee:* Messrs. S. Ashton, J. Brooks, J. Chadwick, J. W. Cooper, J. S. Dronfield, J.P., and J. T. Whitehead. *Librarian:* Mr. J. Fullalove. *Treasurer:* Mr. James Whitehead. *Hon. Secretary:* Mr. T. Widdop. *Assistant Secretary:* Mr. J. A. Newton.

**PHOTOGRAPHIC CLUB.**—Established 1879. *Trustees:* Messrs. Frank Haes and F. A. Bridge. *Committee:* Messrs. A. Bridgman, F. Dowell, A. Mackie, H. Müller, J. Nesbit, Hutton P. Smith, H. Snowden Ward, and J. R. Williams. *Librarian and Curator:* Mr. Charles Wallis. *Hon. Secretary and Treasurer:* Mr. W. R. Stretton, 4, Queen-street-place, London, E.C.

**PHOTOGRAPHIC CLUB OF BALTIMORE CITY.**—Organized 1891. Meetings held at 709, Madison-avenue. *President:* Dr. Frank Slothower. *Vice-President:* Mr. Percy M. Reese. *Directors:* Dr. Frank Slothower, Messrs. Percy M. Reese, L. T. Norris, E. M. Barker, F. W. McAllister, Jordan Stabler, and J. Plumer Bigham. *Treasurer:* Mr. E. M. Barker. *Secretary:* Mr. J. Plumer Bigham, 609, North-avenue West, Baltimore, Maryland.

**QUEENSLAND AMATEUR PHOTOGRAPHIC SOCIETY.**—Established 1883. Meetings held at the Courier Building, Brisbane. *President:* Dr. John Thomson,

*Vice-Presidents:* Dr. Wheeler, Messrs. C. J. Pound and H. W. Mobaby. *Committee:* Messrs. D. McTaggart, F. Nicholls, F. E. Davies, and Dr. Love. *Treasurer:* Mr. J. L. Kinloch. *Secretary:* Mr. W. C. Voller, 88a Queen-street, Brisbane.

**SACRAMENTO CAMERA CLUB.**—Established 1895. Meetings held at the Club Rooms, 504, J-street. *President:* Mr. Ferdinand Kohler. *Vice-President:* Mr. S. B. Nourse. *Directors:* Messrs. Ferdinand Kohler, S. B. Nourse, W. G. Woods, R. P. Burr, R. B. Prideaux, W. E. Cogswell, and J. J. Gormley. *Treasurer:* Mr. R. P. Burr. *Secretary:* Mr. W. G. Woods, 420, J-street, Sacramento, California.

**SOUTH AUSTRALIAN PHOTOGRAPHIC SOCIETY.**—Established 1885. Meetings held at the Chamber of Manufactures, North-terrace, Adelaide. *President:* Mr. C. L. Whitlam. *Vice-Presidents:* Messrs. R. F. Griffiths and Andrew Scott, B.A. *Committee:* The Executive Officers, and Messrs. A. W. Marshall, A. H. Kingsborough, and R. B. Adamson. *Treasurer:* Mr. S. P. Bond. *Secretary:* Mr. J. Gazard, Mutual Chambers, 111, King William-street, Adelaide. *Librarian and Assistant Secretary:* Mr. J. D. Dixon.

**SOUTH SHIELDS PHOTOGRAPHIC SOCIETY.**—Established 1894, Reorganized 1898. Meetings held in the Y.M.C.A. Rooms, South Shields. *President:* Mr. J. Davenport. *Vice-Presidents:* Messrs. W. Parry, A. E. Cowling, W. Hoare, A. J. Hunter, and J. G. Finlayson. *Committee:* Messrs. W. J. Brock, N. Blackburn, M. H. Sadler, A. Hoare, W. Beck, and H. Clark. *Steward:* Mr. T. E. Taber. *Hon. Treasurer:* Mr. W. Short. *Hon. Secretary:* Mr. J. Kyle, 16, Pier-terrace, South Shields.

**WAKEFIELD PHOTOGRAPHIC SOCIETY.**—*President:* Mr. H. M. Briggs. *Vice-Presidents:* Messrs. C. Miles and W. Holmes. *Committee:* Messrs. Norwood, Stanfield, Shaw, Chaplain, Cass, and Grainger. *Treasurer:* Mr. A. H. Roberts. *Hon. Secretary:* Mr. R. Robson, Dunelm-terrace, Sandal, Wakefield.

**WELLINGTON CAMERA CLUB.**—Established 1892. Meetings held at the Club Room, Exchange Buildings, Lambton Quay. *Patron:* His Excellency Earl of Kanfurly. *President:* Mr. A. de Bathe Brandon. *Vice-Presidents:* Messrs. J. McLellan and A. C. Gifford. *Committee:* Messrs. R. L. Mestayer, T. Pringle, B. Joyce, G. W. Bartrop, S. G. Watson, and J. Polson. *Auditor:* Mr. C. W. Stevens. *Judge:* Mr. Malcolm Ross. *Treasurer:* Mr. T. M. Hardy. *Secretary:* Mr. J. A. Heginbotham, Kilbirnie, Wellington, New Zealand.

**WORKING MEN'S COLLEGE PHOTOGRAPHIC CLUB.**—Meetings are held in the Lecture Hall at the College and in the Club's Dark Rooms, Latrobe-street, Melbourne. *President:* Professor Kernot, M.A., C.E. *Vice-Presidents:* Messrs. F. A. Campbell, C.E., T. C. Camm, and A. J. Campbell. *Committee:* Messrs. H. P. Bennett, T. J. Eastham, W. Stutterd, H. Vanheems, and F. Gray. *Hon. Instructor:* Mr. L. Hart, F.R.M.S.—*Lantern Engineer:* Mr. A. B. Sturtevant. *Librarian:* Mr. J. Glover. *Hon. Treasurer:* Mr. E. C. Moore. *Hon. Secretary:* Mr. Arthur J. Relf, Government Printing Office, Melbourne, or 33, Palermo-street, South Yarra. *Assistant Secretary and Press Correspondent:* Mr. J. P. Campbell.

## News and Notes.

**PHOTOGRAPHIC CLUB.**—Wednesday evening, January 11. Members' Open Night.

A new work by Dr. Hermann Vogel, who died recently, is announced by Messrs. Kegan Paul under the title, *Experimental Physics*.

MR. G. SCOTT, of Cimiez, asks: "Can you, or any of your readers, inform me if Dr. Wallich is still alive, and who possesses the negatives taken by him some years ago?"

**ROYAL PHOTOGRAPHIC SOCIETY.**—Ordinary Meeting, January 10, at eight p.m. "Some Remarks on Recent Papers concerning the Latent Photographic Image and its Development," by C. H. Bothamley, F.I.C., F.C.S.

**LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.**—On Thursday next, at eight o'clock, Mr. Howard Farmer will read a paper, "Abolishing the Dark Room." The Hon. Secretary will be pleased to see any one interested in the subject at the White Swan, Tudor-street, Whitefriars.

**ERRATUM.**—Messrs. J. J. Griffin & Sons write: "In converting the formula for Velox into grammes the figures as printed in your ALMANAC, page 1044, are incorrect. The amount of metal should be 1.6 grammes, instead of 16 grammes, as printed. As this is a serious mistake, and might lead to inconvenience, we are taking the liberty of calling your attention to the matter, so that you may correct it in future editions."

**DURHAM CITY CAMERA CLUB.**—At the Royal County Hotel, Durham, on Thursday, December 29, a complimentary dinner was given and presentation made to Mr. Robert Hauxwell by the members of the above Club. The presentation comprised a very handsomely furnished polished mahogany writing table and desk, with brass handles, made by Mr. George Peacock, of Elvet Bridge, from a special design. A silver plate bore the following inscription: "Presented to Robert Hauxwell, Esq., Honorary Secretary, by the members of the Durham City Camera Club. December, 1898."

THE last issue of the Vienna weekly, *Die Wage*, contains a conversation with M. Jan Szczepanik, a Polish inventor, regarding a new discovery which is claimed to be of considerable military value. From this it appears that M. Szczepanik has constructed an apparatus which is set in action simply by light. Starting from this novel principle for the liberation of energy, M. Szczepanik has made a bomb which contains this apparatus in its internal mechanism, so arranged that it causes the bomb to explode immediately a stream of light is thrown upon it by a second apparatus designed for the purpose.—*Reuter*.



**WATER LACQUERS.**—The group of the water lacquers embraces only a few little-used lacquers. Below are some receipts. 1. *Shellac Water Lacquer.*—Boil 28·5 grammes of shellac and 42·75 grammes of borax in 0·564 litre of water until the shellac has dissolved. If bleached shellac is used, a white colour is obtained, with orange shellac a light brown one. This varnish gives a good binding agent for water colours, and is also a useful paper varnish. It dries with a handsome lustre and hard surface which is waterproof. By the addition of aniline colours soluble in water, the lacquer can be tinted as desired. 2. *Enamel Lacquer.*—Mix 0·564 litre of albumen with 0·564 litre of water. For preservation, add a little carbolic acid or salicylic acid. Instead of the albumen, dried albumen may be employed, of which 28·5 grammes are dissolved in 0·564 litre of water, but the colour is less clear. This varnish dries with good gloss. By drying in hot air it becomes more resistive to water. 3. *Blue Lacquer.*—Dissolve 1 pound of good pale glue in 9 litres of water, the colour being entirely dependent on the quality of the glue. Good white gelatine gives a white colour, while brown glue yields a yellow one. Solution accomplished, add (but only directly before use) 28·5 grammes of potassium bichromate, which renders the surface water-tight. As said, the potassium should only be added closely before use, else the solution will be converted into a gelatinous, stiff mass. This mixture constitutes the basis of many leather varnishes. For preservation, the addition of a little thymol or borax is commendable. 4. *Crystal Water Lacquer.*—Dissolve 450 grammes of good white gum arabic and 450 grammes of glucose in 1629 litres of water. This solution dries hard and glossy.—*Färben Zeitung.*

Re HENRY TAYLOR, photographer, Watton, Norfolk.—The public examination of the above-named debtor took place at the last sitting of the Norwich Bankruptcy Court, when a statement of affairs was filed showing liabilities amounting to 264*l.* 5*s.* 7*d.*, and a deficiency of 137*l.* 0*s.* 11*d.* The debtor, in reply to questions, said he was formerly in a large way of business in Soham, Cambs but, being sold up, he, in 1892, removed to Watton, where he lived with his wife, who had a private income, as a private resident. He commenced business at Watton at Michaelmas, 1893. He had not been successful however, and, his wife dying, his expenditure exceeded his income, and he was compelled to file his petition in bankruptcy. He admitted that he had done a little in the way of betting. He did not think that any part of his misfortunes had been caused through betting. During the past three years he had never had a bet to any considerable extent. The last bet he had was in October last, but it was only for a small sum. The Official Receiver: I put it to you that the money did not come out of your pocket, but out of the pocket of your creditors? Debtor: Yes, but it was for a very small sum. The Official Receiver: Did you consider yourself justified in speculating with your creditors' money in this manner, within a month of your bankruptcy? Debtor: I did not anticipate bankruptcy, or I should not have done it. The Official Receiver: I see you attribute as one of the causes of your present position your having been waylaid and robbed. Debtor: Yes. The Official Receiver: You say that at London Bridge Station you were set upon by seven or eight men and robbed of 38*l.* Debtor: Yes. The Official Receiver: Did not you make any complaint to the police? Debtor: I did not complain to any one. I was nearly killed, and got out of it as soon as I could.—The debtor was eventually allowed to pass.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
9	Bradford Photo. Society	In Wordsworth's Country: The Poet Interpreted by the Photographer. Percy Lund.
9	Camera Club	Our Cruise to the Golden Horn. Rev. N. R. Fitzpatrick, M.A.
9	Kingston-on-Thames	Composition and Selection of Subjects in Pictorial Photography. A. Horsley Hinton.
9	Oxford Camera Club	Various Printing Processes. J. B. Wilson.
10	Hackney	Holations: Suggestions for its Prevention. C. H. Oaklen.
10	Iale of Thanet	Architectural Photography. John A. Avery.
10	Lewisham	Lantern Evening.
10	Royal Photographic Society	Some Remarks on Recent Papers concerning the Latent Photographic Image and its Development. C. H. Bothamley, F.I.C., F.O.S.
10	Shropshire	Demonstration: The Development of the Photographic Negative. Wallace Heath.
11	Croydon Camera Club	A Practical Comparison of Flash Light. Messrs. J. Smith, Noakes, and Kough.
11	Leeds Camera Club	With Cycle and Camera in Lakeland. G. Thistlewaite.
11	Photographic Club	Members' Open Night.
12	Ashton-under-Lyne	Class for Beginners: Negative-making.
12	Camera Club	Deep-sea Fishing. Dr. C. S. Patterson.
12	Darwen	Smoking Concert.—Irish Slides.
12	Gospel Oak	The Chemistry of Photography. J. B. Davidson, M.P.S.
12	Liverpool Amateur	Demonstration. Dr. Charles A. Kohn.
12	London and Provincial	Abolishing the Dark Room. Howard E. Farmer.
12	Oldham	Lantern Lectures: Prize Slides.
12	Southport	Southport Society of Natural Science and S.P.C. Joint Soiree.
12	Woolwich Photo. Society	Slides contributed by Affiliated Societies, Set B.
13	Croydon Microscopical	On Lantern Slide Making. A. P. Hoole.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 29, 1898.—Mr. E. W. Parfitt in the chair.

Mr. PHILIP EVERITT brought forward what he thought were some curiosities in exposures. The subject of the photograph—a violin—was really an orthochromatic subject, but an ordinary (Castle) plate was used. The colour of the instrument was of a red and yellow nature, such a one as to give rise to some doubt as to the correct exposure. He stated that guesses which had been made ranged from three seconds to as many minutes. The instrument he placed about three feet from a window, in a side light of a fairly good quality for the present time of year, the lens being stopped down to *f*-10. The two prints he passed round were full of the detail of the texture of the wood, and the exposure given was twenty-five minutes on second trial. No colour filter of any kind was employed, but the rendering was an excellent one.

Mr. H. C. RAPSON said that, working under the same conditions very recently, with a light of a similar quality, upon an extremely yellow oil painting, he got a good rendering with fifteen minutes' exposure. The picture was twice the distance from the window named by Mr. Everitt, and an orthochromatic plate with a deep yellow screen (Ilford, No. 2) was used, aperture *f*-8.

Mr. Lewis Medland entertained the meeting with many new zoological studies, shown by the limelight, other slides being contributed by Mr. Welford (seascapes and Thames scenery) and by Mr. J. S. Teape, who refreshed the memories of those who saw the Shrewsbury Convention with some pictures of the neighbouring country, which are some of the best that have come before the Association during the past year.

### PHOTOGRAPHIC CLUB.

DECEMBER 28, 1898.—Mr. Frank Haes in the chair.

Mr. I. ABRAHAMS delivered a lecture upon

#### JERUSALEM AND THE HOLY LAND.

accompanying his descriptive remarks with maps, plans, and photographs of the country, cities, and innumerable objects of genuine and doubtful authenticity of Biblical interest, which form the chief attraction to the tourist in these parts. From what Mr. Abrahams said as to the sanitary state alone of the places he visited in the course of his tour, it would appear that this Biblical interest need be very strong to induce a second visit; but, nevertheless, seen in London far from their originals, the pictures engaged the wrapt attention of an appreciative audience. Strange and rare were the two pictures of Jerusalem under snow, which concluded the display.

### FORTHCOMING EXHIBITIONS.

1899.	
January 25-31	Perthshire Society of Natural Science. C. F. S. Burrows, Hon. Secretary, 16, Princes-street, Perth.
" 30, 31	Southsea Amateur. F. J. Mortimer, Cornwall House, Ordnance-row, Portsea.
February 4-25	Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, 2, George-street, Edinburgh.
" 13-18	Photographic Society of Ireland. Hon. Secretary, 35, Dawson-street, Dublin.
" 21-24	Hastings and St. Leonards. Exhibition Secretary, A. Brooker, 21a, Wellington-place, Hastings.
March 4-11	South London. Hon. Secretary, A. E. Allen, 27, Princess-square, Kennington Cross, S.E.

## Correspondence.

\* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\*\* We do not undertake responsibility for the opinions expressed by our correspondents.

### THE ROYAL PHOTOGRAPHIC SOCIETY'S COUNCIL ELECTION.

#### To the EDITORS.

GENTLEMEN,—Your remarks *ex cathedra*, on the impending election of the Royal Photographic Society's Council are very suggestive reading to a meditative mind, more especially where they criticise the attitude of the professional man towards the Society.

When you suggest "an unofficial and unaggressive (*sic*) combination" of professional photographers to see "that their interests in the Society are not neglected," one has an uneasy impression that you have studied Machiavelli, "not wisely but too well." Looking over the names of those gentlemen constituting the Royal Photographic Society's Council for the year that has just elapsed, it does not seem to me that the professional man is very conspicuous by his absence. The Council as it stands seems a fairly catholic collection, for one finds the journalistic,



manufacturing, theoretical, portrait, and amateur phases all represented. Indeed, turning to the Council list for some ten years ago, one still finds it bearing a goodly number of professional names. The proceedings of the Society for the last two or three years contain papers on almost every branch of photography, and the photo-mechanical meetings most certainly seem specially designed to lure the professional worker to Hanover-square.

So far there seems no reason why the professional should combine even in the "unofficial and unaggressive way" you suggest. But what does "the typical professional photographer" expect of the Royal Photographic Society? Not long ago I was talking to one, and congratulated him on being an F.R.P.S., as duly set forth on all his mounts and show frames; he replied, very unenthusiastically, that it was so, but that it seemed to him a waste of money, as it didn't bring any more business to his studio! "Ab uno disce omnes!" This without doubt represents the frame of mind of the typical professional photographer towards the Royal Photographic Society, and to all such your advice to "combine in an unofficial and unaggressive way" is excellent; but, having done so, let them form a Worshipful Company of Photographers, who shall look after their financial and trade interests, because, as I understand the object of the Royal Photographic Society, the consideration of any commercial element would be wholly alien to its *raison-d'être*. For the life of me I can't see that the professional photographer should have any interests in the Royal Photographic Society apart from or beyond those of other members. I take it that, if a professional photographer is sufficiently interested in any paper read to join in the discussion, or has a paper sufficiently original to warrant its being brought before the Society, he has opportunities afforded him in common with other members of doing so. What more can he want?

His plaint of being unable to reach a seat on the Council is about as valid as his other complaints you mention. How can a man who neglects to associate himself with the best interests of a Society reasonably expect to share in the government of it? A seat on the Council of the Royal Photographic Society is, or should be, the reward it has to offer for interest and service shown in its well-being and advancement. The Photographic Society was not founded by professional men alone for professional men only, or to keep watch and ward over trade interests; indeed, at the anniversary meeting of the Society in February 1854, a motion was made to disqualify professional photographers from serving on the Council. The Society was, undoubtedly, formed for the advancement of photographic science, and its meetings for the discussion of photographic subjects; and, if the "typical professional photographer" finds that the Society's meetings "have no attraction for him," whose is the fault?—I am, yours, &c.

Tufnell Park, N.

G. T. HARRIS.

## TELE-PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—*Apropos* of your interesting paragraph on photo-telescopes with either concave or convex magnifiers (I used myself a combination of convex lenses, with a Newtonian reflector, some thirty years ago, to photograph a transit of Mercury, in, I think, November 1868), I would wish to remark on the special advantage which a combination of convex lenses may possess in correcting that *eccentric* dispersion of either primary or secondary spectrum (according as we use single or achromatic lenses), which might easily produce coloured margins, sensible to the eye on the focussing screen, upon the outer portions of an image produced by an ordinary tele-photo lens; for, though with the usual concave magnifiers this error is initially less than with convex lenses, yet with the latter it is perfectly corrigible by their due separation, whereas concave lenses can only be perfectly corrected by such a combination of Jena glasses as entirely to destroy any secondary spectrum by destroying irrationality. I think one of your correspondents complained lately of colour in the image of a tele-photo lens.

Requiring last summer a tele-photo combination of quite unusual power for some inaccessible architectural detail, I constructed one by combining two plano-convex achromatic lenses, apparently parts of portrait lenses, which I had by me, and with them magnifying the image produced by a large Ross portrait lens of about twenty-nine inches focus. The extemporised camera, with lenses, as I constructed it, varied in length from six to seven and a half feet, having equivalent foci of from sixteen to twenty-three feet. I send you a print from the first trial negative, exposed for three minutes, the equivalent focal length being then a little over seventeen feet, with a stop of one inch.

I am inclined to think the subject will bear description and investigation. Mr. Dallmeyer's lens was constructed for general requirements, and with a special view to compactness and speed, to which something must needs be sacrificed. Where, however, neither are of primary importance, immediate convenience and cheapness may sometimes be more easily combined with power and efficiency by a different construction. I contemplate several improvements, mainly for covering large plates, when I can find time. Meanwhile it may be worth while to note that, as in tele-photo combinations, only the central parts of the original image are employed; any good old lenses, of fine central definition though

small covering power, may be economically and very effectively utilised for this purpose.—I am, yours, &c.,  
W. H. WHEELER.  
106, High-street, Oxford.

## TRADE ENLARGERS.

To the Editors.

GENTLEMEN,—In last week's issue of the JOURNAL "Free Lance" devotes a paragraph to photographic enlargers' methods. May I be allowed to mention a case of mine by contrast?

In September last I received several negatives for enlargement to 18×16 inches. These were put in hand at once. As, however, the photographer was unknown to me, in accordance with my usual custom, a polite letter was sent with invoice, intimating that remittance would oblige, upon receipt of which the enlargement would be forwarded. To this I received no acknowledgment, and, although this gentleman has been written to several times, no reply has been vouchsafed, and, as I could hardly be expected to send goods indiscriminately to perfect strangers, both negatives and enlargements have lain on the shelf ever since.

Will "Free Lance" kindly make a suggestion in this case?—I am, yours, &c.,  
A PROVINCIAL ENLARGER.

To the Editors.

GENTLEMEN,—"Free Lance" is rather rough on poor trade enlargers. There are, no doubt, black sheep in every flock, and every enlarger may at times be compelled to keep his customer waiting a reasonable time.

I believe any one who knows about things will admit, if it were not for the trade enlargers, enlargements would not be where they are now.

With regard to free portraits, newspapers, &c., no one, I am certain, regrets those things more than the good and *bonâ-fide* enlargers, and any firm doing those should be found out, and left in the cold by professional photographers—"Boycotted."—I am, yours, &c.,  
R. W. HOWES.

Dereham, Norfolk, December 30, 1898.

## ALLEGED PORTRAIT OF CHRIST.

To the Editors.

GENTLEMEN,—As a pendant to your note on the alleged portrait of the Saviour, the enclosed description of "the best of men that e'er wore earth about him, the first true gentleman that ever breathed," may be of interest. It is copied from an original letter of Publius Lentulus, President of Judea, addressed to the Roman Senate, in the days of Tiberius Cæsar:—

"There appeared in these our days a man of great virtue, named Jesus Christ, who is yet living amongst us, and of the Gentiles is accepted for a Prophet of Truth, but His own disciples call Him the Son of God. He raiseth the dead and cureth all manner of diseases. A man of stature somewhat tall and comely, with a very reverend countenance, such as the beholder may both love and fear; His hair of the colour of a chestnut full ripe, plain to the ears, whence downward it is more orient and curling, and wavering about the shoulders. In the midst of His head is a seam or partition in His hair, after the manner of the Nazarites. His forehead plain and very delicate; His face without spot or wrinkle, beautified with a lovely red, His nose and mouth so formed that nothing can be reprehended; His beard thickish, in colour like His hair, not very long, but forked; His look innocent and mature; His eyes grey, clear, and quick. In reproving He is terrible; in admonishing, courteous and fair-spoken; pleasant in conversation, mixed with gravity. It cannot be remembered that any have seen Him laugh, but many have seen Him weep. In proportion of body most excellent, His hands and arms most delicate to behold; in speaking, very temperate, modest, and wise. A man, for his singular beauty, surpassing the children of men."

—I am, yours, &c.,

THOMAS R. BEAUFORT.

10, Victoria Tower-gardens, Millbank-street, Westminster.

## Patent News.

The following applications for Patents were made between December 19 and December 24, 1898:—

PHOTOGRAPH-HOLDER.—No. 26,837. "A New or Improved Device for Holding and Exhibiting Photos and suchlike." H. PRIMROSE.

CINEMATOPHONS.—No. 27,076. "Improvements in Winding Apparatus for use in Cinematographs or for other purposes where Films, Ribbons, or Strips have to be Unwound repeatedly in the same direction." H. EDMUNDS.

PHOTOGRAPHIC SIGNALLING.—No. 27,115. "A Lighting Material for Photographic Signalling and kindred purposes." Complete specification. Y. SCHWARTZ.

REPRODUCTION PROCESS.—No. 27,193. "An Improved Process of Reproducing Pictures, Photographs, Drawings, and the like." H. BIERENZ.



## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* Communications relating to Advertisements and general business affairs should be addressed to MESSRS. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

RECEIVED.—E. M. S.; R. D. SMITH; A. EDGAR; W. B.; W. A. G.; W. WALKER. These and others in our next.

TADROUS HANNA.—In our next.

DISGUSTED.—Yes; from what we hear, we should say that the Cape offers a better field than Australia.

F. W. BEDFORD.—The *Stereoscopic Manual*, by Chadwick, price 1s., obtainable of any dealer, should answer your purpose. Messrs. Percy Lund & Co., Bradford, also publish a little book on the subject, price 6d.

Y. Z.—Better send us an example of the different kinds of pictures referred to, the coloured and the uncoloured. We shall then be better able to tell you how they were made, as all are not made in the same way.

BROMIDE PRINT.—S. Z. The Christmas card sent is not a platinotype, but an ordinary bromide print on matt paper. If you paid for platinotypes, you have been defrauded. There is no other term to use in such a case as this.

NOVITAS STRIPPING FILM.—M. J. JOHNSON says: "Would you please inform me where I can obtain the Novitas stripping film P.O.P., as described in THE BRITISH JOURNAL OF PHOTOGRAPHY for December 23?"—Of Mr. Otto Schozig, 31, Binfield-road, Clapham, S.W.

CARBON PRINTING.—BEDFORD. We know of no carbon tissue made on rough drawing paper. The carbon prints you have seen were made on the ordinary tissue of commerce, but transferred to the rough paper for development. There would be no advantage gained in making the tissue itself on the rough paper.

COPYRIGHT.—T. BIDGOOD. If the photograph is made copyright in England, there is no occasion to make it copyright in Germany. It is copyright there if it is made copyright here, in the same way that a photograph which is copyright in Germany is also copyright here, without registration being necessary in this country.

LANTERN.—T. BELL. The addition of camphor to the paraffin oil is said by some to improve the light and also avoid smell. With regard to the smell, there need be none without the camphor with a good lamp and well-trimmed wicks, provided the outside of the lamp and its fittings are kept scrupulously clean; that is essential.

FERROUS OXALATE.—H. B. Ferrous oxalate in crystal is an article of commerce, and may be had from such houses as Hopkins & Williams, Cross-street, Hatton-garden. It is a very inexpensive salt—about eighteen pence a pound, we think. We should advise you to purchase it instead of troubling to make it, and it is some trouble to make.

PLATINOTYPE.—ARCH. STUART asks: "Would you kindly tell me in your JOURNAL if there is any residue to be obtained from the hydro. acid after the platinotypes have been fixed in it; and, if so, would you tell me what is best to use to throw it down?"—There is no platinum in the acid that would be worth even the slightest trouble of collecting.

COLLODIO-CHLORIDE.—S. COLEMAN. Some of the surfaced papers, as used for lithographic purposes, will answer for coating with collodio-chloride of silver; but it is far better to employ paper specially prepared for the purpose—baryta paper. This may be obtained from Otto Koenig & Co., Cross-street, E.C.; but whether they supply it in small quantities or not we are unable to say.

PATENT.—INVENTOR. You can certainly patent the apparatus, as you can anything else in this country, but we may tell you the patent would not be valid. Similar apparatus, if not identical, has frequently been described in the JOURNAL when photography was comparatively young. However, patents for old inventions are often made profitable, if they are not contested, such is our patent law.

BROKEN NEGATIVE.—C. A. B. It is, as you say, vexing to have a negative broken when it is sent to be printed from, but accidents do happen, you know. We do not expect you will get heavy damages, or any damages at all. As a rule, printers and enlargers notify on their lists that they will not be responsible for negatives sent to them. Nor could they be, as in most cases of breakage in printing it is the fault of the glass.

PICTURES IN SPACE.—SPIRIT asks: "What apparatus is required for projecting pictures in space without screens, and to bring objects near audience in hall, such as I have seen at Egyptian Hall? Are there books on above subjects?"—We cannot profess to explain how the conjuring is done at the Egyptian Hall. An apparatus, however, for projecting images in space was shown at one of the Royal Photographic Society's exhibitions two or three years ago. It consisted of a broad white bath, pivoted in the centre, which is made to revolve so rapidly that it seems invisible. On this the image is projected by the lantern, when it appears as if in space.

HYDROQUINONE DEVELOPER.—A. U. ENDACOTT asks: "Will you kindly give me a recipe for a hydroquinone one-solution developer? I have looked through the ALMANAC, but am unable to find anything but the metol and hydroquinone; but a brother in the profession has it, but will not give me the formula. If you could favour me with same, you would greatly oblige."—Simply omit the metol and double the proportion of hydroquinone. Other proportions of the hydroquinone may be used.

STAINED PRINTS.—WINDSOR asks: "Can you tell me what is the cause of the yellow marks on the enclosed prints?"—We cannot say definitely, except that they are due to faulty manipulation, and of that there is no doubt. By merely looking at a few prints, with no data to form an opinion upon, it is impossible to say the precise cause. Insufficient fixing, too weak a bath, prints allowed to stick together while in it, air bubbles adhering to the prints while in the solution, &c., will cause stains and spots similar to those on the prints sent. Had we seen the prints produced, we should know the cause.

CINEMATOGRAF ENTERTAINMENTS.—SHOWMAN writes: "The new regulations issued by the County Council are putting my business quite out of my hands. Can you kindly give me any tip by which I can get round them, as it is getting a serious matter with me?"—We certainly cannot, for the regulations, as made by the Council and the insurance companies, must be complied with; and the proprietors of places licensed by them will, in their own interests, see that they are abided by. The regulations, as issued, are irksome to many; but the numerous weekly accidents, in incompetent hands, tend to show that there is good reason for them.

PENCIL STAINS ON PRINTS.—J. E. HUNT asks: "Could you inform me if it is possible to remove copying-ink pencil marks on silver prints? I had a number of prints to mount, and each print was numbered and marked with copying ink on back, and the impression from the back now appears on the front. Is there a method of removing the stains? If so, I should feel greatly indebted for same."—We do not expect that the stains can be removed; but, as we do not know the composition of the copying pencil, we cannot say for certain. In all probability, if the stains could be taken out, the remedy would be worse than the disease, as the print itself would suffer by the treatment.

STAINED CLOTHES.—J. COWLEY writes: "I would feel much obliged if you could give me your opinion in Answers to Correspondents of the following: Some days ago I was unfortunate enough to spill a bottle of hydrochloric acid on my trousers, which, of course, immediately became red, and, as red and black pants do not alter their come up to my idea of taste, I should like to know if the stain can be removed, or if they can be dyed, which I greatly doubt. Thanking you in anticipation."—Unless treatment of the stains with ammonia will remove them, the only suggestion we can make is to put the garment in the hands of the dyer, unless, indeed, the fabric itself is damaged. Had ammonia been applied at the time, it is probable that no injury would have resulted.

OPALINES.—PLUSH says: "I should feel obliged if you would answer the following questions in your next issue: 1. What kind of printing paper is the best to use for mounting on glass in opaline form? 2. How is the mounting done? If gelatine be used, should it be any special kind? I have used Ilford P.O.P., but sometimes this does not adhere well at the edges, and when dry it sometimes peels off. Can you give me a remedy to prevent this? 3. Can you give me the address of any actual manufacturers of plush mounts and boxes? I am told that German firms turn these out the cheapest. Your opinion will be much esteemed."—1. Either albumenised or gelatine-chloride. 2. See page 927 of the ALMANAC. The gelatine should be free from acid and colourless. Nelson's No. 2 solution is a very suitable kind for the work. 3. We do not know of any German manufacturers of the mounts. The mounts are supplied by Marion & Co., and similar firms.

GUM BICHROMATE.—GAMMA writes: "I have been reading the interesting article in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1899 on the gum bichromate process, and, as there are two points which are not quite clear to my mind, I shall be glad if you will kindly reply to the following: 1. After sensitising and drying the papers, must the coating with pigment and subsequent drying be done in yellow light, or could the coating be done in daylight? 2. When exposing the paper, please explain more fully the purpose of employing and mode of using a strip of the actual paper you are printing upon as an indicating medium? 3. Would this paper be suitable for first experiments?"—In reply: 1. Yes, in the dark. 2. Simply expose the strip of paper in the actinometer, as directed, until it gets to the tint desired—three, four, or more tints, according to the density of the negative. It is a guide to exposure only. 3. Certainly.

COLLODIO-CHLORIDE.—GOLD AND PLATINUM says: "I should be much obliged if you would give me your valuable opinion with respect to the enclosed collodio-chloride P.O.P. combined toning gold and platinum: 1. I have had the paper some time. I should like to know if it is in good condition yet. Enclosed is a sample unprinted, and one printed (untoned). 2. As I did not receive a formula with the paper, I used the one on page 891 of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, with the enclosed result. I have other formulae, in which the gold baths are almost identical in each case, but in the platinum formulae there is a difference ranging from one ounce to fifteen minims phosphoric per grain chloride of platinum. If you could give me any hints, I should feel obliged."—The paper has become quite spoilt by the long keeping. It is yellow and spotty, and the spots are very pronounced where the paper is looked through. It would be useless to try to get good prints on the paper, whatever bath be used. The toning bath referred to in the ALMANAC of last year is by Dr. Lamer, and is quite right.



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## EX CATHEDRÂ.

WHAT may reasonably be regarded as a small revolution in photographic printing methods appears to us to be in course of progress amongst professional as well as amateur photographers just now. This is being effected by means of the process of printing known as Velox. Some two and a half or three years ago, when this highly convenient method of printing was being brought to the notice of our American brethren by the Nepera Company, of New York, we perceived that its advantages in practice were so great, and the qualities of the results that were then shown were so distinctively fine, that we were sure British photographers would not be slow to avail themselves of the manifest convenience of the process when opportunity offered; and the result shows that we did not err in our confidence. Velox has deservedly taken its place, in a short space of time, amongst recognised modern photographic printing processes.

We are not penning these lines for the express purpose of advantaging, in the estimation of our readers, the Velox process *per se*—the excellence of the results produced on the

various Velox papers is too well known to need insistence upon here—but rather of drawing attention to the valuable principles upon which, in practice, that process relies. Eighteen or twenty years ago, when paper, coated with a washed gelatin-bromide emulsion, was being introduced, such were the then prevalent ideas on the subject that the practicability of a paper having the same characteristics as Velox would, no doubt, have been generally scouted. The high sensitiveness of gelatine emulsions was only then beginning to appeal to the imaginations of most photographers, and to tell them, in those days, that it would have been quite easy to prepare an emulsion paper which could be safely handled in gaslight or diffused natural light, exposed in contact with a negative for a minute or two, and that an unfogged, rich, velvety-black image could be fully developed up in half a dozen seconds by means of a brush charged with alkaline developer, would surely have elicited expressions of scepticism and incredulity. Yet such a process is before photographers at the present moment.

\* \* \*

FROM personal trial of this plan of printing we can speak in praise of its simplicity and qualitative attractions. We observe that many professional photographers—a class notoriously slow to exchange old ideas for new ones—are adopting it. We shall be surprised if the process does not secure a great run. Note that we are indebted for its introduction to our American friend, but we put it to the leading British sensitive-paper makers that there is a vast field open for a surface of this kind—a slow emulsion, manipulatable in actinic light, requiring a comparatively short exposure, developing very rapidly, non-fogging, and yielding rich and varied results. Such a process, it seems to us, creates a place for itself between the ordinary print-out methods and the very rapid bromide development processes. We commend the hint here given to the home manufacturers.

\* \* \*

THE author of the sensation story at present appearing in the *Daily Mail* falls back upon the device, not by any means for the first time utilised, of selecting his characters from living persons, whom he introduces by their own names. He also places photography under tribute, not, however, with the most conspicuously happy results. Here is an extract from a recent chapter: "The advantage that would accrue from some secret



means of photographing instantaneously documents not possible to carry away set him thinking, with the result that he produced a curious and ingenious camera. It was just an ordinary top hat. In the centre of the crown was a small hole, apparently a ventilator, but in reality the small right-angle lens of an instantaneous camera, every wheel and screw of which he made with his own hands. It was devised upon the most ingenious plan. The shutter of the camera could be operated from the brim of the hat. The interior of the *chapeau* was heavily decorated, after the manner of French hats, much pleated and puckered, so as to create, as it were, a false crown, in which he concealed the small metal camera. This had a roll film, and the shutter, once adjusted, could be liberated by pressing a spring connected with a wire to a flat cardboard button, let into the hat brim so artfully as only to be discernible upon the closest scrutiny. This button was located in the front of the brim, just where the thumb might come when taking the hat from the head."

\* \* \*

If we remember aright, Messrs. Adams & Co., of Charing Cross-road, W.C., introduced some years ago a hat camera, but we do not think it was claimed to contain a "right-angle lens of an instantaneous camera," with "wheels" as well as screws. The author, like most novelists who make use of photography, has done so somewhat weakly, it is true, but he has the satisfaction of knowing that he has made his photographic readers smile. It is not every modern novelist who is so successful in that respect. This particular writer lets his character take instantaneous pictures of documents in rooms, &c., but candidly owns that there were fifty per cent. of failures. The liberality of the percentage leaves us not altogether hopeless that the author will one day write learnedly of photography.

\* \* \*

MESSRS. WELLINGTON & WARD, of Elstree, inform us that the continued growth of their business necessitates a further addition to their manufacturing and office premises. They have in hand the preparation of a new flexible support for sensitive emulsions, which will probably be placed on the market in the course of the present year. From the description given us of the manner in which the support will require manipulation, it appears to possess the elements of both novelty and simplicity. We congratulate Messrs. Wellington & Ward on their progress and enterprise, due in large measure, of course, to the fine artistic appreciation and great technical knowledge of which Mr. Wellington is so widely known to be the possessor. Readers of our advertisement pages will have noticed the strikingly effective designs of Messrs. Wellington & Ward's announcements. It will be seen that, at present, their artist has laid a bold hand upon the signs of the zodiac, Capricornus (the Goat) being shown as keenly interested in the science of contact printing from the negative. Aries, Taurus, Gemini, and the remainder of the series will appear in the course of the year. There is wide scope for the introduction of effective designs into commercial announcements, and such departures as that of Messrs. Wellington & Ward deserve encouragement.

\* \* \*

A SPECIAL general meeting of the Pharmaceutical Society of Great Britain was summoned for Wednesday last, to consider a proposal that certain recommendations, framed by the Society

so long ago as 1871, with the view of securing greater safety in regard to the storing, dispensing, and sale of poisons, should be now adopted as compulsory statutory regulations, in accordance with Section 1 of the Pharmacy Act of 1868. From and after the affirmation of the proposal nothing would be required but the formal sanction of the Privy Council to give the regulations the full force of law, with a maximum penalty of 5*l.* for the violation of any one of them. The proposed regulations provide for the securing, labelling, and marking of the special vessels in which poisons are kept, and that the vessel sold shall be distinguishable by touch as well as properly labelled.

\* \* \*

WE have already drawn attention to the fact that, in May next, the Società Fotografica Italiana will hold an International Photographic Exhibition in celebration of the tenth year of the Society's existence. There are to be ten classes for exhibits of historical, artistic, mechanical, photo-material, photo-mechanical, optical, scientific, and industrial interest. According to the prospectus the Exhibition is being planned on a large and comprehensive scale. The Exhibition, which is under the patronage of the Prince of Naples, will have the advantage of the assistance of the Municipality of Florence and a Committee of which the well-known experimentalist, Colonel Pizzighelli, is a member.

\* \* \*

A FEATURE of the Exhibition will be a special Invitation Section of British photography. In this it is desired to illustrate more particularly what has been achieved by the principal exponents of modern pictorial photography in Great Britain, and to that end special invitations to contribute examples of their work have been addressed to the most prominent exhibitors. We are informed that Italian photographers have yet to learn to what a pitch of artistic excellence modern pictorial photography has been brought by British photographers, and it is therefore to be hoped that a unanimous response will be given to the invitations that have been issued. It will be seen, from a letter in our Correspondence columns this week, that Mr. Henry E. Davis, of the Camera Club, has the work of the Invitation Section in hand, and to him inquiries may be addressed. We wish Mr. Davis the utmost success in his efforts to secure a thoroughly representative collection of British work for such an important Exhibition as that at Florence promises to be.

\* \* \*

It has been decided that the Yorkshire Photographic Exhibition at Bradford shall remain open till January 31. The attendance up to the 9th inst. reached the very fine total of 93,000. The number of pictures sold is fifty-five, of the value of £83. We congratulate all concerned in the organization of the Exhibition on the very great success it has met with.

\* \* \*

It is not often that men of science nowadays openly oppose the substitution of the metric system for English weights and measures, but Professor Sweet, in an American contemporary, is courageous enough to do so. In his opinion, allowing that all the advantages claimed for a universal system exist, it would be much easier for the nations now using the metric system to change to the better English one, as they will in time to the English language, because half of them already



have the English measures, using them still to a considerable extent, and the change, if worth while at all, would be easier. Why the nations who had no standard of their own adopted the metric system in place of the English was because it was settled by the men who use the pencil rather than those who do the weighing and measuring.

\* \* \*

He adds that, as evidence that the manufacturers in his country (America) do not favour it, letters of inquiry were sent out to about seventy of the leading manufacturers, and, of over forty replies received, only three favoured it, one or two allowed that they would adopt it when compelled, and the rest were utterly opposed to it and would not adopt it, and yet nearly all these manufacturers are doing a large foreign trade. "The cost affects all industries, from the few dollars of the farmer to the tens of thousands of the manufacturers; and what, he asks, will it save? A lot of figuring claimed by its advocates! While, as a matter of fact, for a time in many cases the figuring will be multiplied tenfold. All drawings will have to be made anew or refigured, all tables changed, the engineers' private notes translated, all the constants in formulae will be wrong, records for estimates will have to be corrected, and, worst of all, every book now printed in the English language, where reference is made to weights and measures, will need to be translated by posterity before they can get a realising sense of the magnitude of the thing mentioned."

\* \* \*

In striking contrast to this unfavourable opinion of the proposed change is the announcement recently published on behalf of the Decimal Association which has taken a leading part in educating public opinion, and in making known the advantages of the metric system in this country. It is pointed out that the strongest argument in favour of metric weights and measures is the fact that nearly all the leading civilised countries of the world, as well as nearly all our competitors in foreign trade, use them exclusively. From a table given in a pamphlet published by the Association it appears that the countries which have already adopted the metric weights and measures represent a population of over 448 millions. Our Consuls have almost unanimously reported in favour of the system; our chief Chambers of Commerce have passed resolutions in favour of it; in the new "British Pharmacopœia" the use of the system has been much extended, and numerous trade associations have given support to it, while in no single case has any body of wholesale or retail traders opposed its compulsory adoption. It is now especially urgent that an Act should be passed to make the change compulsory, and all who are interested in this important question are urged to become members of the Decimal Association, and to give it the benefit of their influence and co-operation. The Secretary is Mr. Edward Johnson, Botolph House, Eastcheap, London, E.C. Possibly Mr. Johnson may think fit to see that Professor Sweet has a copy of the pamphlet.

#### WINTER PHOTOGRAPHY.

LAST week we gave some practical hints as to how many of the inconveniences often experienced during a hard and prolonged winter might be avoided if a few simple precautions were taken beforehand. Up to the present, however, we have had no real winter, for the weather has been abnormally mild for

the season, although a long and hard one was predicted last autumn by some of the weather-wise. There is, however, plenty of time yet; for it is noteworthy that the "good old-fashioned winter" of 1895, which lasted six or seven weeks with great severity, did not set in till later than this, also that it was preceded by a long spell of exceptionally mild weather. Such may be the case this year—who knows?

Professional photographers must, necessarily, suffer some inconvenience from a long and severe winter; but they, at the same time, may often turn it to profitable account, and some have done so in the past, though their number is not large. In Canada, America, and in Russia, winter portraiture is made a profitable feature of. Outdoor backgrounds of snow-clad scenery, accessories, &c., are to be found in most of the studios there, but they are seldom seen in this country, perhaps for the reason that we seldom get a long winter, or, maybe, English portraitists are not so enterprising as their *confrères* across the herring pond; possibly also because portraits with winter surroundings might be thought out of place if we have no frost or snow. It by no means follows, however, that there should be a long period of snow to make winter portraiture profitable. A week of frost and snow will suffice, as many portraits may be required afterwards, as winter costumes are in vogue for months, and there are no more applicable backgrounds for fur-clad figures than those representing wintry aspects, instead of those one too frequently sees used, sunny summer ones. Heavily or fur-draped sitters, before a bright, sunny summer background, always strikes one as being not a little incongruous.

Portraits as Christmas and New-year's cards have become pretty general during the past year or two, but they would often be more in keeping if they were taken under seasonable aspects—winter costumes and wintry surroundings. Most of the pictorial chromo-lithographic cards are representative of winter, in some form or other; why, then, not photographic ones?

We have, before now, pointed out how easily any one, even unacquainted with drawing, can quickly convert any old disused scenic background into a suitable one for the present purpose, simply by emphasising the sunlit parts with white paint, distemper, or even with a piece of chalk, and any other points upon which snow might be supposed to settle; also how winter effects can be further represented in the studio by covering the tops of outside accessories with cotton-wool, which makes a capital representation of a thick coating of snow upon them. A few sheets of drapers' wadding spread upon the floor will convey the idea of a thick fall of snow, and thus complete the arrangement of a really congruous winter scene.

Falling snow in the picture is well imitated by slightly splashing or spraying the negative over with an opaque pigment. The tube water colours, diluted with thin gum water, is an excellent medium for the purpose. If the sitter be taken holding up an umbrella, whitened on the outside or covered with thin wadding, the "snow" may be wiped away from the face, and thus, while the features are clear, there will not be the incongruity always noticed in such pictures, where the snow is shown falling thickly everywhere except just before the face. If we have any real winter this year, the foregoing hint may be of service to many portraitists by reminding them that winter, with all its inconveniences, may be turned to account by bringing additional grist to the mill.

Turning from the professional to the amateur element of



winter photography. Up to the time of writing, the amateur has had, at least in the metropolitan districts, but little opportunity of obtaining winter pictures, but is he ready to take them as soon as an opportunity may occur? In the fickle climate of this country we may have a heavy fall of snow at an hour's notice, but, with a sudden change in the temperature, all trace of it may be gone in a few hours; therefore the opportunity, which may not occur for another year or more, should be seized at once. Although we may have no snow this winter, there is little doubt but that we shall have plenty of hoar frosts in the morning, even in the spring, and these make excellent food for the camera, particularly for lantern slides. The best hoar-frost effects do not last long—only for a very few minutes sometimes—for, if the sun puts in an appearance, they quickly disappear. But, while the sun is shining, the particles glisten like diamonds, and that is one of the greatest charms of hoar-frost pictures, especially in the lantern.

To get the best frost or snow effects, backed plates are imperative. Seeing that the best of this class of subject has generally to be taken at short notice, and frequently without time for special preparation to be made, we ask if all amateurs who desire to secure such subjects are fully ready to secure them immediately the opportunity occurs, and thereby obtain what they may not have the chance of doing again till perhaps next winter.

**A New Element—Powerful Emitter of Actinic Rays.**—Since Röntgen's wonderful discovery various investigators have been at work studying the properties of radiatives of somewhat similar properties from various unelectrified bodies. M. Le Bon's "dark light" and M. Becquerel's experiments with uranium and its salts are cases in point. Recently we gave an account of the discovery of a new element, extracted from native oxide of uranium (pitchblende), to which the name of polonium was given, which possessed a radiating power far greater than uranium. Mons. and Madame Curie, the discoverers of polonium, have, in conjunction with M. E. G. Bémont, been making further investigations on the same lines, and have succeeded in extracting what they believe to be another new element, the chlorine salt of which possesses a radioactive power of extraordinary activity, 900 times that of uranium. But, even at this point, the experimenters named believe that their newly discovered element, which they term radium, is only extracted in a very impure state, and that, if they can succeed in isolating it, its activity will be enormous. Its physical properties very closely resemble those of barium, as does its behaviour in the spectroscope, with the exception that radium shows one unknown and unnamed line. As to the specific action of the rays, they will render potassium platino-cyanide fluorescent through a thin sheet of aluminium, and in half a minute will have as much action on a dry plate as uranium will in several hours. The authors conclude their paper by saying, "We thus realise a source of light, very faint, it is true, but functioning without a source of energy. In other words, this is very like a case of "perpetual motion."

**Röntgen Rays in Therapeutics.**—The action of the rays in producing dermatitis, an acute inflammation of the skin, became known at an early stage of the experimenting they were subjected to, but for a while their properties in this direction were not investigated. At present, however, they promise to be as useful in medicine as in surgery in connexion with the photographic plate. So far as regards the injurious action on the skin, Dr. Schiff, in a communication to the Vienna Medical Society, points out that no harm accrues if the radiation be not too strong, or if, when strong, it be not permitted to act for too long a time, till hyperæmia or excessive determination of blood to the skin. He narrates his experience in the case of the most intractable disease, lupus, one form of which

he had been able to cure; and, indeed, he brought his patient to the meeting of the Society, and showed that, after two months, there had been no return of the malady.

**Ten Million Diameters' Enlargement.**—Dr. Elmer Gates, of Washington, invented a new form of microscope, and published a description of it some eighteen months ago, by means of which he claims to be able to obtain photo-micrographs with objectives of comparatively low-power enlargements on a scale hitherto undreamt of. When his discovery was first published, it was treated with derision, but he appears to have been steadily working in the same direction, and has formed a syndicate to produce the new microscope, which, he states, performs the marvellous feat of amplifying the image to the extent of 10,000,000 diameters. He terms his instrument the double microscope, and in a recent number of the *American Journal of Microscopy*, has a long descriptive article of his invention, which, at the outset, seems simple enough. It is, in fact, simply an arrangement of two microscopes, placed one behind the other. A comparatively low power is employed with the instrument nearest the object to be photographed, and, its eyepiece being removed, a second instrument is employed to magnify the image, the objective of the second microscope being placed in the focal plane of the first, taking the place, in fact, of an eyepiece. Taking a one-sixth of an inch objective for the first, and a two-thirds of an inch for the second, Professor Gates claims to have obtained a magnification greater than would have been obtained with a one-sixteenth of an inch as ordinarily employed, with details beyond what a one-twenty-fourth would give. He claims to have demonstrated that his principle of magnifying the image gives far better results than obtaining the same degree of magnification by the use of high-power objectives. Naturally an immense amount of light has to be employed when the area of the image is so great compared with the minute aperture the available light has in the first instance to pass through. Professor Gates has one method of obviating this difficulty, which consists in using a powerful electric light, but allowing only the more refrangible rays to pass through the objective, and so avoid burning up the object or the objective. The microscope he is now engaged in constructing is built with his special monochromatic illumination as the leading idea. His experiments, so far, have been with a twelve-inch heliostat, the rays from which are condensed to less than one-hundredth of their diameter, then rendered parallel and passed through the microscope after being filtered from the heating portion of the spectrum. It would be premature to criticise the instrument in its present stage; we can only say we await developments.

**Eclipse Observations.**—The interest taken in the solar eclipse of last January is well shown by the facts published by the Meteorological Department of the Government of India, that no less than 158 observers took part in the observations which are being tabulated and reduced, and which, it is expected, will be printed during the course of the year.

## DEVELOPMENT, INTENSIFICATION AND FIXING, IN ONE OPERATION.

### II.

So far, the best results have undoubtedly been obtained with pyro-ammonia, possibly because more attention has been given to this method than to any other, though hydroquinone and soda, and ortol ammonia seem to promise well. One element in favour of pyro-ammonia is the almost unlimited power it gives of modifying the reducing action, a power which can be pushed or utilised to a far greater extent in physical than in merely chemical development. In fact, it would seem that the full value of the Wellington method of development or intensification can only be secured when the alkali is used in the caustic state or in a very concentrated form. When carbonate of soda is employed, there is comparatively little opportunity of varying the reducing power of the solution, and it is for that reason that ortol ammonia has been used for gelatine plates.



instead of ortol with carbonate of soda or potash, in order to secure the advantages of physical intensification with the minimum of pyro stain.

The reducing solution consists of the ordinary ten per cent. pyro, with a similar proportion of metabisulphite of potash, or 1 ounce each of pyro and metabisulphite made up to 9 ounces of stock solution. This can either be used from a dropping bottle, or may be diluted with 15 volumes of water for actual use, 1 drachm being made up to 2 ounces of developer. It is more convenient, however, to use the whole of the solution by means of dropping tubes, as they are then equally ready for either gelatine or collodion. Another formula which works well, and contains sulphite of soda in place of the metabisulphite, consists of pyro 1 ounce, sulphite 4 ounces, with 60 grains of citric acid, the whole made up to 9 ounces as before. The citric acid is intended to slow development in order that it may be arrested at the proper moment, when a long exposure has been given to the production of warm tones.

The other developing solutions consist of the usual ten per cent. bromide and liquid ammonia—one in eight—the latter strength being chosen as the most convenient for collodion plates while equally applicable to gelatine if desired; in fact, I use the same solution indiscriminately for both gelatine and collodion, the formula being practically the old "ten per cent. solution."

But the most important item in the combination is the intensifying solution, for which I use substantially Mr. Wellington's formula, but in a more concentrated condition and with the proportions a little varied. I have given several months' attention to the working of this with a view of discovering the functions of the various ingredients, with the result that it now works with a degree of certainty and satisfaction that I had not hitherto met with.

Briefly, the principle upon which the solution works appears to be this, that the solution of silver should be in a state of what has been called "unstable equilibrium," ready on the slightest inducement to throw down some of its metal in one form or other. The silver solution itself should be in such a state of concentration that, when added to water in the proportions in which it is used in the developer, it will *barely* retain its contents without precipitation. It may indeed be of such strength that added in this manner a precipitate is caused, but this, though not otherwise objectionable, gives rise to a muddy solution during intensification. When in this delicately balanced state and under the influence of the reducing agent, the silver is deposited with great rapidity, and at the same time with perfect regularity, and, as I shall show, the progress of the operation can be modified to almost any desired extent.

The precise composition of the silver solution does not matter except so far as it affects convenience. Almost any combination of silver with hypo, sulphocyanides or cyanides, sulphites or other solvents, can be used for intensifying, though it is only when the conditions laid down above are observed that a practically useful solution is obtained. Mr. Howard Farmer's original solution of bromide of silver in hypo was objectionable for these reasons, namely, that owing to the strong solvent action of the hypo it was absolutely necessary to use it fully saturated with silver, and in that condition, in the presence of the reducing agent, the precipitation took place too rapidly; there was no regularity or certainty that intensification took place at all, though an unnecessarily large quantity of silver was thrown down somewhere, principally on the sides of the dish.

The introduction of sulphocyanide of ammonium by Mr. Wellington changed the state of affairs completely; and I think it will be found that the very quality that unfits sulphocyanide for fixing purposes makes it useful for this. It differs from hypo and cyanide in its solvent powers in this, that it dissolves an increasingly larger proportion of silver salts as its own strength is increased, whereas with the other two the stronger the solution the smaller the relative proportion of silver taken up. The immediate result of this is, that whereas, on diluting a saturated solution of silver in sulphocyanide of ammonia, no matter to what extent, a *precipitate of silver salt* will take place; but, under the same circumstances, hypo solution, when diluted, will *take up more* of the silver salt. Hence, if a saturated solution of hypo be prepared for use, the very act of adding

it to the developer, by dilution restores some of its fixing power, and consequently it attacks the film of bromide of silver. Incidentally, it may be mentioned, too, that this explains why a negative that is slow in fixing may be hastened by taking it from the fixing bath and washing it. The pores of the gelatine being full up of saturated hypo, the fixing is stopped; but, when the hypo is diluted by washing, its fixing action reasserts itself.

Although the solution may be formed by dissolving bromide or chloride of silver, for the purpose of securing the greatest amount of control it is preferable to use nitrate of silver, as the sulphocyanide of silver then formed is more soluble than the haloids, and, further than this, is convertible into the haloid condition in the solution, which gives a further power of modifying the action. For instance, the addition of a drop or two of bromide solution, by converting a portion of the sulphocyanide of silver into the less soluble bromide, brings the silver into a more precipitable state, and thus hastens the action. Theoretically a soluble chloride should act still more energetically, since chloride of silver is less soluble in sulphocyanide than the bromide; but here the contrary, or greater soluble power of the hypo, comes in to neutralise it. Iodide of potassium, or other soluble iodide, exercises the strongest action in this direction.

W. B. BOLTON.

#### THE PACKING OF PLATES.

How well I remember my first box of dry plates, somewhere back in the "seventies," and how they were packed in a thin wooden box, with nailed lid. The variety in methods of putting up dry plates at the present day is wide, and, as in my speed-testing work I have to open boxes of every brand sold in England, I am tempted to give my impressions on this minor question, in the hope that it may lead to reform in one or two directions. If I write in a fault-finding strain, let me offer one consolation to our plate-making friends, who have lately turned out such good wares, that there is little room for a grumble at the quality of the films, and one can only criticise such points as packing, designation, and speed-marking.

First of all, oh, ye of the Paget Company, why are the *x's* on the labels of your boxes so ingeniously located that they cover the end of the box which has to be opened, and are always torn off in consequence? An unfortunate possessor of one opened box each of xxx and xxxxx is a lost man if he did not remember to pencil these brew-house symbols on the boxes when he opened them. It is true that there is a slight difference between the colour of the labels, but can a weak mortal be expected to remember that so many *x's* belong to a blue-grey, and so many to a grey blue?

A few years ago a number of makers put their plates in perfectly plain boxes, the name and other information being on an outside wrapper, which had to be torn off to get at the plates. Any identification was therefore destroyed when the box was opened. The Warwick Company, who are now almost alone in this plan, have brought it still further to perfection, so that, when you have torn off the wrapper, you have a perfectly plain black box on which you cannot even write the magic word "Warwick" with a black lead.

The Paget Company also adopt a nameless box with outer wrapper for their Phoenix plates.

What a difference to the methods of the Ilford people, who put the label bearing the name of the plate on the lid of the box as well as on the outer wrapper, and, as a further precaution (in case of lids getting changed), put the plate name on the bottom of the box.

The Barnet firm also indicate the different brands by initials on the bottom of the box, but I do not remember any one else adopting this plan. The four firms who mark each package with their Hurter & Driffield speed numbers do so on the outer wrapper only, and, as this has to be torn away to get at the plates, the information is lost unless one remembers to pencil it on the box-lid. Surely there is room for improvement here.

In the case of the Gem Company, the distinguishing name of the brand is also sacrificed when the outer wrapper is torn off, and the different speeds "Universal" or "Meteor" are only distinguished on the boxes by different coloured labels.

One is not likely to forget the opening of a box of the dear old Wratten plates; first a string has to be cut to take off the lid, within is a sealed package which again requires the aid of a penknife, then



wrapper after wrapper of different kinds of paper, there being five in all, before the plates are reached. Contrast this with the simple wrapping of four plates in one piece of paper only as adopted by most makers now. I have never found the simpler plan endanger the plates.

I doubt if the plan of wrapping up plates in "waxed" (paraffin) paper has any real value.

Such paper is not really waterproof. It is true that damp air can be kept out by this means for a few hours, but not for days.

The methods of packing the plates inside the box are of interest. The strips of paper put between the ends to keep the plates apart often cause markings, although not of a serious nature, being close to the edge. I have not noticed that the use of corrugated paper (B. J. Edwards) leads to markings, but with this plan, there being no wrapper of paper on the plates, a double lid has to be provided for the box.

For convenience of use, four plates in a wrapper simply laid in a box with flat lid is hard to beat.

Personally I do not like the boxes with slide in lids, where the plates are drawn out at end of box, it being difficult to replace one of the parcels when opened to take out one of the plates.

The plan (invented, I think, by Mr. Cowan) of folding plates face to face, being left joined by an unbroken hinge of film, seems to answer its purpose; I must, however, record the fact that, in the case of Thomas's lantern plates packed on this plan, I have spoilt many plates by treating two extra thin ones adhering together as if they were one, and this even when I was doing my best to avoid such an error.

The colour of the label on a box is of importance for use in a dark room, and the name of the plate should also be in large, plain letters, or it will be impossible to read.

Messrs. Fitch put up their excellent films in blue envelopes. Every dark-room light is especially designed to cut off all blue light, and consequently the Fitch packages reflect no light in the dark room, and are absolutely black. The printing on these blue wrappers is therefore invisible in the dark-room light.

And why, Messrs. Fitch, when you list your films as Ordinary, Rapid, and Special Extra Rapid, should you not also print these names on the packages? The labels only tell us of sensitometer 20, or 25, or 30, as the case may be, and, as these numbers are not mentioned in your list, you set us a puzzle each time we pick up a package of your films.

Probably either yellow, or orange, or white is the best colour for labels to read in the dark room, and it is a mistake to attempt to distinguish between different brands of plates by the colour of the label only, as dark-room light upsets this.

A variation in colour for each different brand of one maker's plates is a useful distinction, especially on a dealer's shelf, but in my opinion it is far more important to print the distinguishing name in large letters on the label pasted on the top of the box.

Another bone to pick; this time with the Ilford Company. Their plan of wrapping up cut sizes of P.O.P. in shaped paper with flaps to fold over is excellent for that purpose. But it is a mistake to apply it to the package of films; there are minute pinholes at the corners of the packages through which the light can come, and, after the outer envelope is opened, the package is unsafe.

There is one immense improvement in connexion with the marking of packages which will probably not be adopted until users of plates insist upon their interests being considered before that of the dealers. I allude to the importance of marking each box of rapid plates or films with the date of manufacture.

It is a well-known fact, acknowledged by the best makers, that fast plates do not, as a rule, keep well, and cannot be relied upon to give clear, vigorous negatives after six or nine months from date of manufacture. It is not to the user's advantage to have plates more than six months old, but it is not to the dealer's advantage to declare the age of plates, in case he should be left with an unsaleable stock on hand. It is here that the difficulty lies, and I feel sure that makers would willingly mark each box with the date of manufacture if dealers did not strongly object to such a course. In the mean time knowing photographers do not go to dealers for fast plates, but go direct to the makers, in the case of films the Eastman Company have boldly "taken the bull by the horns," and mark each package with the intimation that it must be used up before a named date, the date being some eight months or so after manufacture. It is some satisfaction to me, and a proof that calling attention to these matters is not without result, that the Eastman Company, in making this change some years ago, quoted my published opinion that even the best of films will not keep good for long. The Blair Company have also adopted the same plan.

If makers would unite together to mark date on boxes of plates, the difficulty would be solved.

In my speed-testing work I find it absolutely necessary to mark each box with date of purchase, as the nearest approximation to the desired information.

ALFRED WATKINS.

### THE KROMSKOP.

It was pleasant to hear the genial New-year's greetings of the members of the Camera Club when they met together once more, on Thursday, the 5th instant, after the usual Christmas recess. It seemed as if many of them had come to the Club for this especial purpose, for there was a very full attendance; but in reality there was a great attraction in the subject which was down for demonstration and discussion, for Mr. Saville Kent had promised a paper on "An Amateur's Essays in Three-colour Photography," illustrated by kromskop lantern pictures.

Mr. Saville Kent is well known to the Camera Club, and to others, as an ardent naturalist and a skilled photographer. His lecture upon his lizard pets is well remembered, and no one is likely to forget the splendid series of pictures which he exhibited at the Crystal Palace not long ago, to say nothing of the books which bear his name; so that Mr. Saville Kent came before the Club once more with that zest of all guarantees, the kindly good-will of an appreciative audience.

The lecturer may fairly lay claim to being the first amateur to go thoroughly in for three-colour work, and that he has done so was soon evidenced by the remarkably fine pictures which were thrown on the screen by Mr. Ives's kromskop lantern arrangement. This instrument, it will be remembered, possesses three lenses, with only one luminant, and by it three-coloured discs can be shown separately, or superimposed by the touch of a lever. In the instrument used on the present occasion the registration was very perfect, but the light was poor, and unfortunately the effect of the pictures was to some extent spoilt by scattered light. We were not surprised to learn that the examples shown were far more effective when seen in the table form of kromskop.

Mr. Kent opened his discourse with a few remarks as to the great advantage of being able to secure coloured representations of natural-history objects without the help of fallible hand or brush work. The pictures which he had to show were about fifty in number, and represented the pick of 400 negatives which he had taken with the Ives apparatus. All the pictures had been taken during the last four months, and they were not intended to demonstrate the scientific aspect of colour photography, but to show the use of the process in the hands of a naturalist like himself. He was shortly going again to warmer climes, and he hoped, by help of the three-colour apparatus, to photograph the organisms of the tropical seas, coral reefs, &c., and thus reproduce the colours of some of these gorgeous products of Nature's laboratory in a manner which would be quite impossible with pigment and pencil. He was convinced that much could be done with the kromskop in this way, and he trusted that his own humble efforts in this direction would constitute a mite towards the realisation of the project.

The first examples shown were a series of beautiful orchids from the collection of Mr. Smee, of Carshalton, who had kindly given the lecturer every facility to photograph them in his greenhouses. Some of these flowers were of the most gorgeous description, and Mr. Kent had added to their effect by introducing moths, butterflies, and humming-birds into the various pictures for the purpose of colour contrast. These were not put in in a haphazard way, but with a keen eye to composition and artistic effect. Thus a yellow-toned orchid would have near it a blue butterfly, the two colours enhancing the brilliancy of one another. Yellow, by the way, seemed to be the most difficult colour to represent in this manner, and the greens also lacked the richness of nature. The reds and blues, on the other hand, left little to be desired. The orchids, beyond their beauty, are chiefly remarkable for their long names; but one, at least, had a little romance attached to it, for it could not be obtained until a certain man-eating tiger in Nepal—where the plant alone is found—had been dispatched.

The pictures next shown brought us nearer home, for they were taken in that paradise of botanists, Kew Gardens, some in the open air, and some (as, for example, the gigantic *Victoria Regia* lily) under cover. Once more at the Antipodes, we were shown a beautiful assemblage of moths on a tree trunk, photographed, of course, from dried specimens, some corals, and a tiny baby lizard, which, on the first day of its life, we were told, ate some beef steak, cut up small. Some more lizards followed, and these pictures illustrated in a remarkable manner how well neutral and metallic tints are shown in the kromskop. A made-up picture of gold and silver carp, apparently swimming in their natural element, brought the Exhibition to a conclusion with a remark from the lecturer that snap-shooting with coloured screens was at present in its infancy.

Mr. Stroh, who occupied the chair, congratulated the lecturer upon the success of his work, and remarked that the pictures were the best of their kind which he had yet seen, and he invited members to discuss the matter, which was one of supreme interest to photographers.

Mr. Ward, who had for a long time been associated with Mr. Ives in exploiting the kromskop, told how he had watched the dawn of the in-



vention years ago at Philadelphia. The Americans did not see the value of the thing. One said Ives had got colour photography on the brain, another remarked that it was a pity he did not turn his talents to something more useful, and so on *ad libitum*. Mr. Ward advised Ives to come to England, where he would have the opportunity of consulting Abney and others who were interested in the question of colour photography. Many of the pictures shown by Mr. Saville Kent he considered quite as good as those produced by Mr. Ives himself. He believed that the kromoskop method of showing coloured pictures put every other system into the shade, and, now that they had a camera and multiple back for taking these pictures with comparative ease, few could tell what a wide future was before it.

The Rev. F. C. Lambert offered the lecturer his congratulations for the magnificent results which he had achieved. He would point out that the dry-as-dust scientist had once more turned up "trumps." The photographer is now beginning to see that the scientist, working quietly and unostentatiously in his laboratory, is in reality laying the foundation for all good practical work. It was that great man, Clerk-Maxwell, who might truly be said to be a century in advance of his time, who worked out the colour curves in his Cambridge laboratory, upon which all succeeding experimenters have had to base their work. We are too apt to despise the scientist, as Captain Abney had reminded us over and over again; but, as photographers, we owe these men a deep debt of gratitude, and should bear this in mind as we come in at the finish and take all the cream off the bowl. We do not do half enough in this country to promote scientific research, a string upon which the late Professor Tyndall was always harping. He looked forward to the time when scientific men, freed from all cares and worries, would be able to work out these natural problems, which were so important to mankind at large.

Mr. Sanger Shepherd gave an interesting *résumé* of the three-colour process from Clerk Maxwell's work in 1861, when imperfect results were shown at the Royal Institution—imperfect, because there was then no sensitive plate which would give the whole range of the spectrum, and no means of making colour-screens, the aniline dyes not being then available to the purpose. He reviewed the work of Ives, and showed how the introduction of the Spectrum plate was of enormous value to the process.

The Chairman then invited Mr. Saville Kent to give his hearers some sketch of his manner of working out the three-colour process: in response to which hint, Mr. Saville Kent said that he would be only too happy to give any information in his power.

The first difficulty to contend with was the English climate, which made the question of exposure so uncertain. In ordinary photography waste glass soon began to accumulate; but since he had taken up the triple method he had started a greenhouse. At first he used nothing but Lumière's plates; but more recently he had employed Cadett's Spectrum plate. He developed his plates with metol, by Ives's formula, with consequent ruination to his finger nails. The exposures were very long, averaging fifteen to twenty minutes for the red screen, eight for the green; and a short time for the blue, the stop used being *f*-22. He developed in almost complete darkness; but those whose fingers were sensitive enough to distinguish the right side of a plate would find little difficulty in that direction, the great difficulty was the constant variation of the light, due to our inconstant climate. The proceedings closed with the usual vote of thanks, and many went home meditating the addition of a multiple back and coloured screens to their ordinary equipment.

#### THE MAKING OF A PICTURE.

THERE was a good attendance of the Leeds Photographic Society on Thursday evening, 5th instant, to hear Mr. W. E. Tindall, R.B.A., lecture upon "The Making up of a Picture." In introducing the subject Mr. Tindall said that "Hints to the Picture-makers" would be a more appropriate title, and any hints, such as they are intended for the benefit of those who wish to take with the camera, something which to them shall be more than a mere portrait of a given place.

In looking at pictures you should ask yourselves, "What is the principal intention?" and, having satisfied yourself, endeavour to put yourself in his position and see if the artist has carried it out properly, or as you would have done; and, if not as you would have done, Why?

"Although the plate will give you the drawing you require, I think that a knowledge of drawing to the photographer is of the highest importance; it strengthens many of our faculties, such as memory and observation, and these play a very important part in picture-making. We can achieve little without them; it is impossible to paint an effect while it is there, the best we can do is to make a few rapid notes to assist our memory, and of course the subject will supply the detail and form. This applies with equal force to photographers. Another study most useful to the art worker is perspective. Perspective to the picture-maker is what grammar is to the writer—both necessary adjuncts to production. You would often find it difficult to express your thoughts clearly, but a knowledge of the primary rules of perspective will help you immensely. It is most important that you should understand the principle of perspective, particularly for portraiture, in that you ought to

make the spectator feel that the head is completely round, that it has a back as well as a face. You hear some one complaining that the portrait is simply a mask and sticks to the background; the fault is in aerial perspective."

Referring to colour, the lecturer said it was almost as necessary to the black-and-white man as to the painter. There are several kinds of black and several kinds of white; "the black you want should be a rich, juicy, succulent black, a black with power in it and yet tenderness, a black that will suggest space and not give you the impression of a grey piece of paper."

"The white you should use is not white at all. Did you ever see white in nature? If the sun is shining, and you stand up so that your back is to the sun, you will see your form outlined on the ground. This is called a shadow, simply because you have shaded or prevented the sun shining on the place. This shadow has not added anything on to the ground, it has taken something off—sunlight, or, in other words, light. Thus I think you will see, if you wish to represent "light," you must have warmth, and white is not warm, it is cold."

#### THE THREE-COLOUR PROCESS IN GERMANY.

To the pages of the *Photographic Times Almanac* (New York), Herr Otto Gantzer sends the following instructive account as to the position of the three-colour process in Germany:—I presume that the reader is perfectly *au fait* in regard to the process itself, and therefore confine my remarks simply to the impression one gets from studying the many three colour prints one sees in this country daily, and to such points of interest which I have gleaned in conversing with practical men—engravers as well as printers—whom it has been my fortune to meet here.

"Of the more prominent 'Kunst Anstalten' in this country there is only a baker's dozen, and hardly that many, whose work comes up to a fair average, and of these again are only three or four who will furnish work of a really meritorious character. Among these, strange to say, two of the largest and best-known firms are missing, Meisenbach, Riffarth & Co., Munich, and Anerer & Gössel, Vienna, who do not favour the three colours, but still employ the old process of chromotypy in five and more colours. The Vienna firm's objections are mainly of a theoretical nature, as they contend that many grey, blue, and green tones cannot be reproduced by this process, and that the complexity of this process with the repeated copying and transferring, and the loss of detail occasioned by this, makes the process unsuitable for real art work. To my mind, these reasons do not stand, or the firm mentioned has had no occasion to see the reproductions of later years, which by actual comparison with the original drawings prove to be facsimiles of so high a merit, that it is impossible to believe another colour more would improve the work in any degree. What the addition of another or more colours would undoubtedly bring about is the loss of the artist's technique, a blurry indistinctness of the whole picture—two points which it is the good fortune of a correct three-colour print to entirely eliminate from the possibilities of this process. Of course, there are colours which cannot be reproduced at the present condition of this process, as cobalt blue and its components, all the electric greens, &c. But this is not the fault of the process, but of the colours and inks as manufactured."

"The process of making the plates is practically the same here as with us. The main difficulty lies in the intelligence and carefulness of the photographer. Correct negatives properly toned down ensure good results and materially lessen the labour necessary for correcting the printing plates. This labour, here in Germany, of etching, re-etching, hand-tooling, and retouching amounts to a great deal, in fact it seems to be the whole secret of the process, since the necessary negatives are generally made in three or four days, while the printing and finishing of the plates takes as many weeks. Orthochromatic dry plates are used for the first exposure, wet plates for the screen negatives, a hard negative generally gives the best results. I found the Carbutt colour filter mainly in use, and in only one or two instances came I across dry collodion filters which were not factory-made. Aniline colours in alcohol are used here for these filters, which, however, change easily, no matter how carefully kept, so that the spectroscope is constantly employed to determine their condition. Where a spectroscope is not available, trial exposures should be made from the three colours, which, in the form of printing inks, are rubbed on to paper. Then it will be seen if the filter shuts out the corresponding colours. Filters are carefully kept in a steady temperature of 75° F., and are used behind the lens and close to it. Lenses are to be carefully selected, such without a chemical focus; they are apt to throw pictures in different sizes for each different colour. The anastigmats of German make give good satisfaction. The Levy screen—175–150 lines—is exclusively used here; it should be turned exactly 30° for each colour to escape the so called *moire*."

"In this whole process everything, of course, depends on the proper adjustment of the three negatives to each other. The red plate is considered the worst one of the lot and gives the most trouble. Up to date there is no such thing as a faultless red negative, which could be used without retouching; the main difficulty, however, lies in the copying, and printing, and etching from these negatives, in the work of putting the three printing plates in proper accord to each other. At this



point mention must be made of the work of Dr. Selle, who invented the art of putting three coloured gelatine films over each other and thereby produces a diapositive from nature. The greatest merit by far of his work, however, is, that his negatives and positives do not require any retouching, and, as I happen to know, are not retouched in any manner. Dr. Selle is an amateur, and furnishes the negatives to gelatine printers, who get excellent results by treating the gelatine plates in the ordinary manner. His exposures with dry plates and daylight are timed by seconds, while other workers in daylight use 2-5 minutes for one exposure, and with electric light as much as an hour. The time of three exposures is in the proportion of 1 to 4 to 12 according to the colours. Among the publications of recent date, two especially have drawn the attention of the interested public. One, a set of twenty tables, representing flowers and plants, made by Husnik & Haeusler, Prag; the other a set of some dozen animals, from the works of George Buxenstein & Comp, Berlin, are the *ne plus ultra* of three-colour prints ever published on this or any other continent.

"Comparing these with the original drawings, it is evident that no artist lithographer could reproduce them more true in colour and tone or show the technique of the artist to better advantage. As a rule the German printer, who cultivates this class of printing, submits his prints or proofs to the artist, who drew the original, and follows the suggestions of this critic in every way. That the result thus obtained is a highly creditable one goes without saying for him who knows the highly developed state which the art of painting and drawing has reached in this country. The fact, that all the best-known and most celebrated professors and teachers of painting of this country have expressed their satisfaction with the results which may be obtained by this process speaks certainly worlds in favour of it.

"And now a word about the printing from such plates. The best press here in use for this class of work is a stop cylinder, built by König & Bauer, with improvements suggested by the foremost practical printer of this country, Mr. George W. Buxenstein. It is a stop cylinder, with perfect ink works and a special arrangement to ensure absolute register, runs at a speed of about 1000 per hour, and permits to keep the loss from bad register and other sources down below six per cent. Printing editions of more than 10 000 the loss falls still below that figure. Each colour must be allowed to perfectly dry before running the second colour; absolute evenness of temperature is necessary to keep the paper from stretching or shrinking; and cleanliness and a careful handling throughout are required.

"The Germans have, no doubt, succeeded to make this process useful for many purposes, as it is applied to publications of art and science where, in many instances, the limited art of the lithographer has failed to do full justice to the work. The Germans also have succeeded to reduce the cost of such work to a point that it may well compare with work done in eight colours from stone and be infinitely more meritorious from an artistic standpoint, which leaves no doubt to my mind that, in this country at least, the three-colour process has a future in store and will in time revolutionise all colour processes in existence at present."

#### VARNISH A CAUSE OF SPOTS ON NEGATIVES.

In the December number of *Photographic Scraps* appears the following note on a hitherto unsuspected cause of spots on negatives. A correspondent writes to the Britannia Works Company: "I am sending a negative for your inspection. Will you kindly examine same and state the cause of the spots? My negatives are well washed, and I allow at least fifteen minutes for fixation, with hypo of the regular strength. I have found spots on several other negatives that did not show when first printed from, but, after storing, spots appeared. It has been most trying to me, as these spots have appeared almost always on the most valuable negatives from which I wanted reprints. In most cases the spots have not been noticed until some time had elapsed, but in this case they appeared within a few days. I am sorry about this, as it is the only fault I can find with your plates, and I feel satisfied that the fault is not yours, but is due to something in the working. I say this because of my past experience of many years. I have used many thousands of your plates.

The Company remark: "The above letter was accompanied by a first-grade studio portrait negative, literally covered with minute bright reddish-brown spots, so close together that the film was practically one mass of colour, and useless for printing from. The negative had been varnished, and when we removed the varnish, as a preliminary towards an investigation, the spots were found to be on the film. They were of such a nature that no previous experience of ours could explain their cause. We therefore asked for more negatives and for more information, putting special questions about the varnish used, and how and when it had been employed. These inquiries elicited the facts: (1) that the spots only arose in the case of negatives that were varnished; (2) that they had only appeared since the last lot of varnish bought had been in use; (3) that when first this varnish had been used the spots were infrequent and not serious; (4) that the trouble had been getting gradually

worse, more general, and earlier in appearing after the negative was made. The source of the trouble was clear: the varnish was impure, and, by keeping, its impurity increased. The bottle was thrown away, and a new supply obtained, with the result that no more spots were seen."

#### THE OPTICAL LANTERN FOR SCHOOLS.

THAT the magic lantern is increasing its sphere of usefulness is undeniable, here, there, and everywhere, it is found assisting in all classes of work. At the Perth School Board last week a proposal was brought up from the Works Committee to have one of the class-rooms in the Southern District School fitted up for magic-lantern displays. This, of course, immediately put the economists (?) on the defensive. Mr. Masterton moved disapproval of the proposal. As an argument against the lantern he instanced the big schemes already in hand by the Board; the lantern scheme would cost not less than 100*l.*, and he thought could be well delayed. Mr. Bridges seconded, he was unable to see any use of a lantern at all. Mr. Ramsay moved approval of the proposal. It was now almost impossible to teach geography to large classes without representations on screens; the cost would not be over 25*l.* expenses.

Baillie Love was against the proposal, it was all a fad; Mr. Ramsay, he thought, was amusing in the extreme; how had their forefathers and the present generation learned geography without magic lanterns? It was folly to encourage a teacher in nostrums of this kind. The Chairman (Mr. F. Norie Miller) supported the proposal, remarking that the Edinburgh School Board, who were possibly almost as enlightened as the Perth Board, had gone in for lantern teaching. In reply to the discussion, Mr. Masterton said they were up to the neck in debt, hence he was against this expenditure. On a vote being taken, four voted for the lantern and three against it; the lantern will therefore be one of the educational agents under the Perth School Board. Probably this action has been instigated by some of the energetic members of the local Photographic Society.

#### WEIGHTS AND MEASURES.

THE question of weights and measures is unfortunately one which is always proving harassing to photographers, and probably always will till the metric system drives out our own bad British systemless "system." Confusion is often caused by the use of the term "per cent." or the symbol "%," in several different ways.

Suppose we have a solution of, say, potassium carbonate in water, and we wish to express the relative proportion of water to solvent, we naturally select some standard which we can also apply to other solutions. That is the object of the percentage system, whether units of volume or weight are used. It is in the careless use of these units that confusion is introduced, for we can make use of either (or both) weight or volume. We can say that 100 parts by weight of the solution (100 grammes, let us suppose) contain 50 parts by weight (50 grammes) of potassium carbonate. This is what most technical and purely scientific text-books would call a fifty per cent. solution. The units both of solvent and solute are those of weight.

Now, the specific gravity of this particular strength of potassium carbonate solution is 1.544. Hence 100 grammes will occupy a volume

$$= \frac{100}{1.544} = 64.8 \text{ c. c.}$$

Since weight = volume and density.

This means that 64.8 c. c. of the solution contain 50 grammes or (by simple calculation) 100 c. c. contain 77.2 grammes.

The difference between the two modes of expressing the same thing will be apparent if we place the results side by side.

#### POTASSIUM CARBONATE SOLUTION.

Sp. gr.	Grammes per 100 grammes.	Grammes per 100 c. c.
1.544	50.0 grammes.	77.2 c. c.

Photographers will always prefer measuring solutions to weighing them, and therefore the second mode of expression is that which they will wish to adopt.

Unfortunately, the photographic formularist has got to call this second solution a "percentage" solution. Etymologically, it is, but as a matter of fact the units of weight are generally understood to be used in an expression of strength in "percentage."

We have treated this point at some length because we wish to allude to some suggestions which have been published in a German contem-



porary\* with regard to the adoption of a symbol which shall point out what mode of expression is being used.

Dr. O. Everhard suggests—

$p/00$  for percentage by weight.  
 $v/00$  " " " volume.

Thus, a potassium carbonate solution of sp. gr. 1.544 would be written as "50  $p/00$ ," whilst a photographer's so-called "ten per cent. ammonia" would be dilute "ammonia ('880)," 10  $v/00$ .

We still require, however, a symbol for the mixed relation of weight per volume (or of volume per weight), and for this we would suggest that Dr. Everhard's symbols be amplified as follows:—

Percentage weight per weight .....	$p/p00$ .
Percentage volume per volume .....	$v/v00$ .
Percentage weight per volume .....	$p/v00$ .
Percentage volume per weight .....	$v/p00$ .

Thus, to revert once more to our potash carbonate solution, it might be written either as "50  $p/p00$ ," or as "77.2  $p/v00$ ," and in each case the reader would be under no doubt as to what was meant.

This system of nomenclature is, of course, applicable to any system of weights and measures having a simple relation between its units of weight and volume.

G. E. BROWN.

### HILL'S REFLECTING CAMERA.

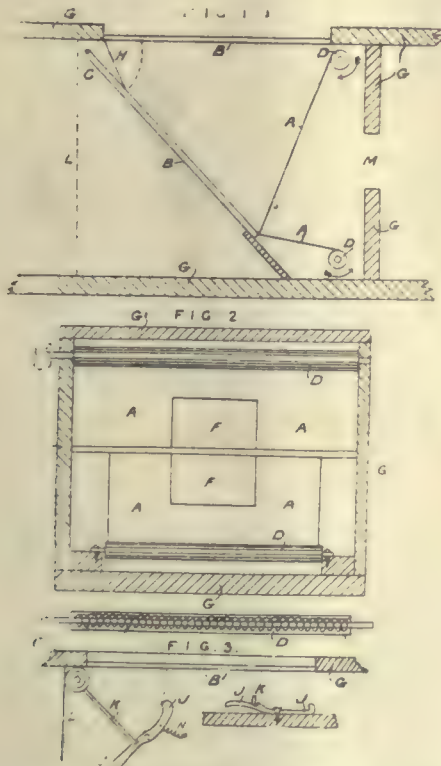
THE improvement consists in attaching a blind shutter of peculiar construction, marked A in the drawings, to a reflector, so that a full-size image may be seen up to the moment of exposure on the focussing screen, B<sup>1</sup>, which is on the top of the camera and of the box form.

The reflector is hinged or pivoted at one end, and free to move from a position parallel to the focus screen to an angle of 45°.

At the top and bottom of the camera, and in a plane with the back of the lens, spring rollers are fixed (marked D in drawings), each pulling in contrary directions.

The top roller will have means whereby an increased tension may be given by winding.

A blind, marked A in drawings, is attached to these rollers, which is



pierced by an opening, marked F, and the free end of the pivoted reflector, B, is attached to the blind, so that one-half the blind is above the reflector and one-half below.

Drawing No. 2 shows the shutter when at about an angle of 30°, and the construction preferred of roller and blind, but it is obvious that two separate blinds with apertures, affixed at edge of reflector, would answer equally well.

\* Chemiker Zeitung, 1898, pp. 28, 93.

To obviate any chance of light penetrating the top aperture, a small blind of opaque fabric may be hung from edge of focus screen, marked H.

The camera is set for exposure by drawing down the reflector by means of a pin piercing a slot in the side, and affixed to the mirror, or preferably the pivot would pierce the side of the camera at point C, and be attached to a lever working outside the camera, which is held and released by some such simple catch as shown in drawing 3. This catch, J (fig. 3), is a bent lever pierced by a screw, which acts as a fulcrum, and is notched so as to hold the lever, K, when at an angle of 45°. When the lever, J, is pressed on the lower end, towards the body of the camera, the exposure is effected by the lever, K, being released.

When, however, the lower end of the lever, J, is pushed towards the front of the camera, the lever, K, is also released, but in this case, the lever, J, being free to move on the screw, the upper end catches the lever, K, when at about an angle of 15°, checking the mirror when the lower aperture is opposite the lens, and continues its movement when the pressure is relieved, as it is drawn out of its path by a small spring, N.

To obviate vibration, the mirror may with advantage be of metal or other suitable material.

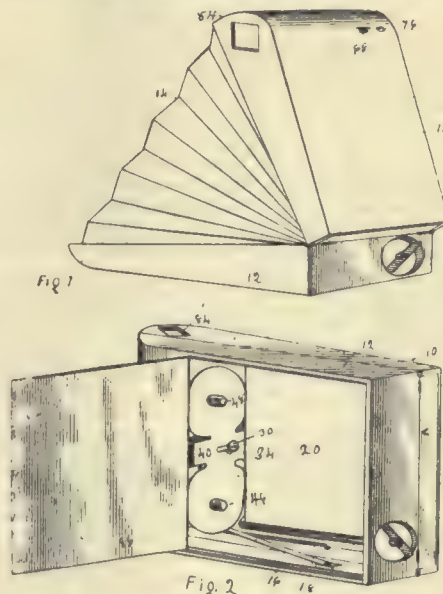
### DESCRIPTION OF DRAWINGS.

A, blind; B, reflector; C, pivot; D, rollers; F, aperture; G, body of camera; H, cut-off; J, catch; K, lever; L, focal plane; M, lens aperture; N, spring.

### THE KOZY POCKET CAMERA.

FIG. 1 is a perspective view, showing the camera opened. FIG. 2 is also a perspective view, showing the camera closed, the door through which the film rolls are introduced being opened. FIG. 3 is a side elevation of the camera opened, the outer casing, or framework, being indicated by dotted lines, the interior mechanism being shown in full lines. FIG. 4 is a similar view of the same parts with the camera closed, and containing an independent plate-holding device. FIG. 5 is a plan view of the film-supporting platen and connexions removed. FIG. 6 is a rear end elevation of fig. 5.

The camera box, or casing, is made in two parts, 10, 12. By a hinged connexion at the rear ends thereof said parts are held together, and movement thereof is permitted for swinging the free ends of said parts



one from the other in order to open the camera box for use, as shown in figs. 1, 3. Between said parts a folding bellows, 14, of light-excluding material, is arranged for excluding light in the usual manner. Said parts are supported in open position by a bar, 16. Said bar has one end in pivotal connexion with the part, 12, and has its other end in sliding connexion with a rod, 18, attached to the part, 10, this being in order to permit the movement required of said bar in folding the camera parts together, as shown in fig. 4.

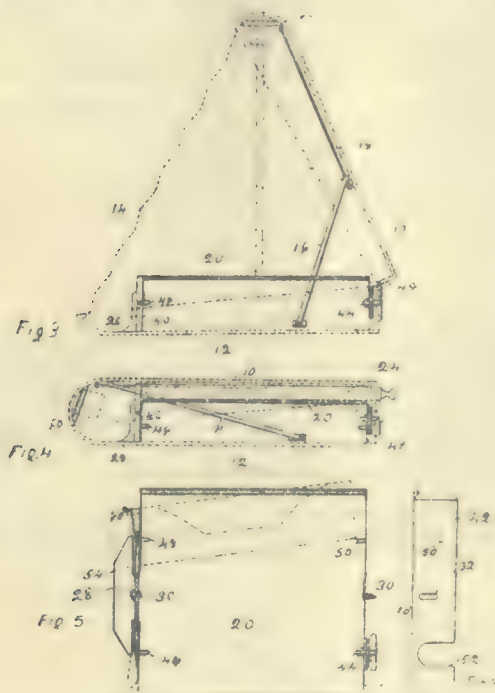
In the outer, or free end of part, 10, is located the lens and its shutter connexions. This arrangement is an important feature of this invention. By it the obliquely arranged lens is brought into focal position, perpendicular to the film-supporting platen, 20, by the simple operation of opening the camera, and it allows of the platen being securely and economically connected with the part, 12.

In carrying out the arrangement of platen, 20, within the chamber of



part, 12, the inventor has had in mind to arrange for the introduction of an independent plate-holding device, 24, (fig. 4.) To this end the platen-supporting connexions are made adjustable, whereby movement of the platen adjustably is allowed from the focal plane, as shown in fig. 3, to a plane there below, where upon the independent plate-holding device, 24, of usual construction for holding glass plates, may be introduced through a suitable opening at the back of the camera part, 10, and rest upon the platen, 20, all as shown in fig. 4.

The platen, 20, is form d of sheet metal with roller connexions, supported at the sides thereof in the usual manner. At the front and back ends of the platen and integral therewith are downwardly extending plate-projections, 40, 42, formed by overturning and projecting down-



wardly the platen metal. Said plates are made to bear in sliding connexion one with the inner face the back wall of part, 12, and the other against the face of supporting block, 28, and they are held in place by screws, 30. Said screws being located in oblong slot, 32, 34, have only to be loosened in order to permit the platen being moved to different planes of altitude below the focal plane.

Supported for movement rotatively in the rear end of part, 12, is the stud, 44, on which to support one end of a film-holding roll, and it has winding connexions to engage the spool at that end. On the plate, 40, is a stud, 46, whereby to support the other end of said winding spool. The spool from which the sensitised material is taken is supported on the studs, 48, 50, the film being made to pass over the platen, 20, is thereby supported in the focal plane. To permit the described adjustment of the platen, 20, plate 42, has an oblong recess, 52, allowing for the winding stud, 44. The plate, 40, is cut away from the platen, 20, except at the central part thereof, as shown in fig. 2, in order that the end portions thereof may be sprung outwardly as indicated by dotted lines, (fig. 5,) and thus permit introduction and removal of the film-holding spools. The normal tension of said parts in springing back to place operates against the end faces of said spools and gives a tension thereto for holding the film tightly drawn. For ordinary purposes this tension is sufficient, but a spring is provided in support with the part, 28, and bearing with its ends against the plate, 40, as shown in fig. 5. The supporting block, 28, will be understood as having a fixed connexion with the frame part, 12. The lens and shutter devices are supported by a block, 60 (fig. 4), whilst 76 (fig. 1) indicates a shutter-releasing push button, and 68 is a shutter-setting device.

#### KRUGENER'S IMPROVED ROLL-HOLDER.

This is an improved form of roll-holder, constructed in such a manner that it may either be made use of independently from or in connexion with the detective camera.

It forms an independent body, and no part of it is attached to the camera, the latter being thus fit for use without a roll-holder.

Fig. 1 represents the camera with the spool-holders and screens, viewed from above.

Fig. 1a gives a vertical view of the spool-holders and the manner in which they are mounted.

Figs. 2 and 3 show a modification in the method of attaching and screening the spool-holders.

In the first form the roll-holder is composed of two metal plates, *a* and *b* (fig. 1a), which are screwed or fastened together by two obliquely arranged partition walls, *c* and *d* (fig. 1), the whole thus forming a separate body, whilst the partition walls act as screens and prevent the light transmitted by the lens or objective from falling on the spool-holders and film thereupon.

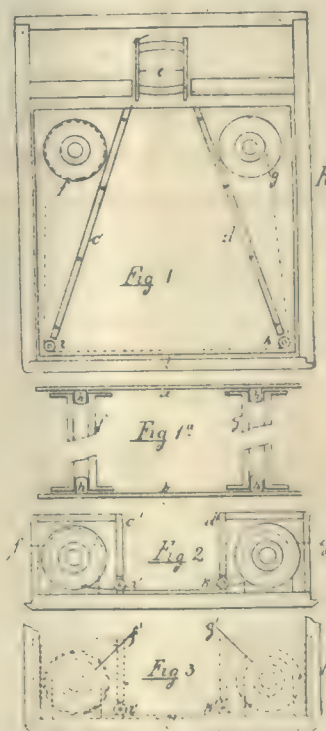
The improved roll-holder contains four rollers, two of which, *i* and *k*, are small and merely act as runners for guiding the film in its passage from one spool-holder to the other. The other two, *f* and *g*, are mounted on studs on pins, *h* (fig. 1a), which are attached to the two metal plates, *a* and *b*, mentioned above.

The film thus passes from the supply spool, *f*, over the runners, *i* and *k*, to the receiving spool, or "clamping reel," *g*. This latter is turned by a key and winds up the film, *m*, subsequent to the exposure.

When employed in a detective camera, the improved roll-holder, which, as already stated, forms a separate body, is placed in the camera, the key being then applied from the outside. Care is then taken that the position of the film coincides with the plan of the focussing screen, and, when this is accomplished, the back cover, *l*, of the camera is put on.

The improved roll-holder may also be made in the following modified form:—

The large rollers (spool-holders), *f*<sup>1</sup> and *g*<sup>1</sup>, hidden or screened by partition walls, *c*<sup>1</sup> and *d*<sup>1</sup>, are mounted on a wooden board, *l*<sup>1</sup> (figs. 2 and 3), forming the back cover of the camera. In this case also the film, *m*,



is kept in exact register by means of two runners, *i*<sup>1</sup> and *k*<sup>1</sup>, attached to the back cover, *l*<sup>1</sup>, in such a manner as to facilitate the winding of the film. The back cover, *l*<sup>1</sup>, at the same time acts as a table or backing for the stretched film, *m*.

When it is desired to use the camera without the improved roll-holder, the board, *l*<sup>1</sup>, is replaced by an ordinary back cover, *l* (fig. 1).

The main feature of the present invention being the provision of a separable or detachable roll-holder, no stress is laid upon the special construction of the spool-holders, which may be of any convenient form.

#### THE CAMERA CLUB.

The following notes, abstracted from the January number of the Camera Club Journal, relate to some very interesting subjects that are to be brought before the Club at its evening meetings during the present month. On January 16, Mr. Horace Brown, F.R.S., will deliver a lecture on "Prehistoric Remains in Greece." The Society of Photographic Etchers has shown, in the last members' Exhibition, what can be done with comparatively little practice. It is announced that, on January 19, Mr. E. Sanger Shepherd, who is well known both as a scientific and



practical worker, has consented to instruct the members in his "Modifications of Photographic Etching." Mr. C. J. S. Makin, an old photographer, will, on January 23, illustrate his "Recollections of Life and Scenery in many Lands"—principally on this occasion in Eastern lands—with a large number of descriptive slides. The next Club-house dinner will take place on Tuesday, January 24, at 7.30 p.m. Owing to the success of the meeting last year, it has been decided that this shall be a cyclist dinner. In connexion with this dinner, the Hon. Secretary intends to have, on January 24 and 25, a small exhibition of cycling novelties and accessories, particularly those connected with photography. On January 26 an account of the "Recent Soudan Campaign" will be given by Mr. W. T. Mand, the Special Correspondent of the *Graphic*, illustrated by slides made from his sketches. On January 30, an interesting series of slides of scenery and architecture in the British Isles will be shown and described by Mr. E. Duckree, who is well known for the excellence of his work and the charm of his pictures. Chief Justice Rayner, of Lagos, has come home on short leave, and has promised a description of life and scenery in that colony before he returns. Surgeons-Major Morgan and Eckersley have promised a lecture on "Campaigning in East Africa."

### PROPOSED UNION OF YORKSHIRE PHOTOGRAPHIC SOCIETIES.

MR. EZRA CLOUGH, Hon. Secretary (*pro tem.*), of 13, Chesham-street, Bradford, has addressed the following invitation to the Hon. Secretary of each photographic society in Yorkshire:—

"You are invited to attend a meeting of gentlemen, with a view to forming a Union of Photographers and Photographic Societies in Yorkshire, to be held at the Bradford Grammar School, on Friday, January 27, at 7.30 p.m.

"Among the probable advantages of such a Union may be mentioned: united action for the purposes of exhibitions, competitions, and matters of general importance; interchange of lecturers, lectures, prints, and slides.

"Please invite one or two of your members to accompany you."

We are asked to state that, if Mr. Clough's letter has failed to reach the Secretary of any Yorkshire society, the publication of this notice may be regarded as equivalent to an invitation to be present at this meeting.

### MID-CHESHIRE EXHIBITION.

THE opening of the Verdin Technical Schools, Northwich, the munificent gift to that town of Sir Thomas Verdin, offered an opportunity, which the public-spirited Committee were not slow to take advantage of, by arranging for an Industrial and Art Exhibition. An excellent and representative collection was brought together. The Photographic Section, which alone concerns us, was, without being noteworthy, a very promising show, especially so as it was the first of the kind in Northwich. The photographs were divided into nine classes, seven being for photographs of a general character, one for stereoscopic views, and another, divided into ten sub-sections, for lantern slides, no picture which had previously received an award being eligible for competition.

The Judges were Mr. George E. Thompson and Mr. G. Watmough Webster. Five bronze medals were awarded in the general classes, and one silver and one bronze medal for lantern slides. Of the five medals, one in the Enlargement Class was awarded for an enlargement, a view of *Lincoln Cathedral*, by Mr. A. H. Burgess, a technically perfect print. Dr. Marsh, who had a remarkably good collection of Röntgen-ray prints, among them being one, almost unique, embracing the whole of a human figure, from the occiput to the last metatarsal phalanx, was justly entitled to, and received, a medal.

A simply posed, well-lighted, small portrait study of a young girl in a blouse (so faded as to be almost invisible) had much merit and received a medal. The exhibitor also received a medal for a pretty landscape. Mr. J. Dean's *Cheshire Lane* was a pretty woodland scene that, with a little more care, might have been a striking picture: an inch cut away from the top of the print and a figure suitably introduced in the foreground would have wonderfully improved it. A silver print of a triumphal arch, with the flags garishly coloured by hand, should not have found its place in this collection, topical interest though it possessed. Two large views (not for competition) of Messrs. Brunner Mond's works, taken under most difficult circumstances from the summit of a large chimney, were very interesting, and gave an excellent idea of the vast industry connected with their name. *En passant* we may say that they seem to manage these things well in Northwich, for on our visit we were disappointed in seeing no buildings out of perpendicular, nor any gaping cavities in the high roads, as recent newspaper accounts led us to expect. But when a building goes wrong there they simply get screwjacks to work, and have it put square in a very brief space of time. We did not notice in the Exhibition a single representation of this remarkable state of affairs. Above all, we expected to see, but did not

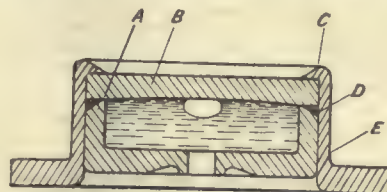
see these Northwich catastrophes represented in the Lantern slide Section. The silver medal, awarded to the President, was obtained by four beautiful slides, well printed, rich in tone, representing incidents of an athletic gathering; the exposures must have been very brief, for, whether tossing the caber or dancing a highland reel, the figures came out with remarkable sharpness, vivacity being the keynote of the set. Gymnastic exercises—a set of lantern slides by J. Lyon, and representing a number of performers in each of the various positions beloved of the gymnast: horizontal, vertical, heads up, feet up—were an equally good set of slides, but with less variety than those of the silver medalist, received a bronze medal. Altogether the small Exhibition must encourage the promoters, and lead them to hope for still better things in the future.

## Our Editorial Table.

### A NEW SPIRIT LEVEL.

Taylor, Taylor, & Hobson, Slate- and Steel Works, Leicester.

MESSRS. TAYLOR, TAYLOR, & HOBSON have been studying to make circular spirit levels more reliable and permanent, and they send us a sample, together with the following details, of its construction: The spirit chamber, is made in one close-grained homogeneous piece by squeezing from a flat aluminium sheet. It is pointed out that this white metal enhances the contrast between the colour of the bubble and that of the surrounding spirit. The connexion between this chamber and the glass, B, is now made of such a form that any expansion of the metal is compensated, and the joint is not opened. Leakage is further prevented by the elastic ring, D, which is compressed into the angular



space of the joint. The level is assembled by forcing the chamber, A, into the outer jacket, C, until it comes into contact with the glass at A. The rim of the jacket at C guards the glass from injury, and this outer jacket, being separated from the spirit chamber, may be strained or bent even considerably without causing the level to leak. The new level, which retails at the low price of one shilling, should find favour at the hands of those photographers who appreciate scientific accuracy in the construction of the instruments they employ.

We have received from Mr. W. H. Fletcher, background specialist, of Kepler Villa, Wombdon-road, Bridgwater, several photographs of his specialties in backgrounds, interiors and exteriors, and graduated and cloud effects. These evince great taste in design, and are evidently the work of a skilful artist in this branch of work.

## News and Notes.

We are sorry to learn of the death of Mr. Richard Keene, photographer, of Burton-on-Trent, who passed away on the 5th instant, in the forty-seventh year of his age.

ROYAL PHOTOGRAPHIC SOCIETY.—Photomechanical Meeting, Tuesday, January 17, at eight p.m. "On some New Half-tone Screens of English Manufacture," by J. E. Johnson.

A NEW book on *The Platinotype Process*, by Mr. W. J. Warren, will be published immediately by Messrs. Iliffe, Sons, & Sturmer, Limited, 3, St. Bride-street, Ludgate-circus, London, E.C.

THE gold medal offered by the editor of *Darlington's Handbooks* for the best photograph taken by travellers during 1898 has been gained by Mr. J. Kearney, Liverpool, and the second prize by Mr. R. Brookes, Norbiton, London.

ERRATUM.—Mr. Richard Penlake writes: "There is a small printers' error in my article on p. 3 of the *LANTERN SUPPLEMENT*: 13×8 cm., third line from finish, should read 13×18 cm. Please make a note of this, as it is a very important point."



LAST week we omitted to mention that we were indebted to an old contributor and friend of the JOURNAL, Mr. T. Stokes, of Clare, Suffolk, for the excellent little article, "A Convenient Arrangement for Copying." It was received too late for our ALMANAC.

**PHOTOGRAPHIC SOCIETY OF IRELAND'S EXHIBITION.**—The Hon. Secretary writes: "I shall be glad if you will kindly draw your readers' attention to the fact that the last day for receiving entries for our Annual Exhibition is Saturday, January 28. Particulars, labels, &c. can be had from me."

**SOUTH LONDON PHOTOGRAPHIC SOCIETY.**—Members and friends are reminded that the Annual Dinner of the Society takes place on Saturday, the 21st inst., at 6.30 p.m., at the Montpelier Tavern, Choumert-road, Peckham; tickets 3s. 6d. each. Intending diners, please advise the Hon. Secretary, Mr. A. E. Allen, 27, Princes-square, Kennington, S.E., this week at latest.

**MESSRS. MATTHEWS & CO.,** of Central Mills, Gough-street, Gray's Inn-road, W.C., inform us that they have opened an office in Manchester, at 49, New Bailey-street, Albert Bridge, for the sale of bullion and purchase of jewellers' and silversmiths' sweeps, and all residues containing gold, silver, and platinum. All sweeps and residues &c., forwarded to them will be prepared, sampled, and assayed, and full value returned as promptly as possible.

THE Scientific Press publishes this week a new text book on *Photomicrography*, by Mr. E. J. Spitta, who is already well known for his joint authorship of *An Atlas of Bacteriology*, and for his other photographic and scientific works. The book will be published in 4to form, with full-page plates and numerous illustrations, and will undoubtedly prove of the greatest interest to all those who are taking up the increasingly popular subject with which the book deals.

**REMOVING GREASE SPOTS.**—Mr. Pellechet writes: "I read in the last number of the JOURNAL (Friday, December 30, 1898, p. 835) a notice about doing away with grease spots. I can give you a very simple and trustworthy method, i.e., covering the spot, or the oiled place, with a powdered earth called *terre de Sommières*, which is sold in France by the ordinary druggists. (You must leave the earth on the spot twenty-four hours at least.) That earth is a very fine argile, the earth of which earthenware vessels and also porcelain are made. The earth drinks the oil, and, when you have repeated the application sever 1 times, if necessary, the oil or grease has disappeared from the paper (or the cloth, if a garment has been soiled)."

**POPULAR EVENING AT THE BRADFORD PHOTOGRAPHIC SOCIETY.**—A variety entertainment, especially for ladies and children, was arranged under the auspices of the above Society in the large hall of the Grammar School on Wednesday evening, January 3. Mr. Ezra Clough occupied the position of Chairman, or Master of Ceremonies, and about 140 people, including a large proportion of young folks, were present. The programme included numerous items by the gramophone, under the management of Miss Watson, songs by Miss Lily Ellison and Mr. R. O. Lawson, and a lantern entertainment by members of the club. Each child present received a toy or a game, a box of chocolates, an orange, and an apple. The affair was exceedingly successful, and reflected great credit on the sub-committee of the Bradford Photographic Society, which had the arrangements in hand.

**BIRMINGHAM PHOTOGRAPHIC SOCIETY.**—The Fourteenth Annual Exhibition will be held at the Royal Society of Artists, New-street, Birmingham, from February 27 to March 4, 1899. The Exhibition will be inaugurated on Saturday evening, February 25, by a private view and *conversazione*, and will remain open from 10 a.m. to 10 p.m. from Monday, February 27, to Saturday, March 4. The rooms are excellently lighted from the top (artificially by electricity), and admirably arranged for the display of artistic work to the best advantage. The Judges will be: Messrs. William Crooke, A. Horsley Hinton, and W. T. Wainwright, A.R.W.S. There will also be an exhibition of apparatus, cinematograph and lantern entertainment, vocal and instrumental music will be given each evening. The Hon. Secretary is Mr. C. J. Fowler, Court Mount, Erdington, near Birmingham, of whom all necessary particulars may be obtained.

**RICHMOND CAMERA CLUB.**—A popular lecture, entitled "The Camera and the Wheel," will be delivered in the Masonic Hall, Greyhound Hotel, on Monday, January 16, 1899, at 8.30 p.m., by Mr. F. O. Bynoe (B. & J. Beck, Limited). The following is the syllabus: 1. The Harmony of the two Pastimes. 2. How a Camera takes a Picture. 3. The choice of Apparatus and its required Scope of Work.—(a) The lens; how to know a good lens; what is meant by a single lens, a rectilinear lens, a fixed-focus lens (illustrated with limelight diagrams); the advantage of the fixed focus lens for snap-shot work. (b) Magnifiers (supplementary lenses), their use and theory (illustrated with mechanical slide). (c) The photographic shutter. (d) Something about films. (e) Magazines for hand or stand cameras. The Frena system (illustrated with mechanical slide). 4. Carrying the Camera on the Cycle, and the Cycle as a Tripod. 5. How to manipulate the Camera. How to hold the camera steady; result of jarring the camera when exposure is being made; the disappointing results frequently obtained when photographing subjects containing bright colours; how to obtain a correct idea of how a subject will appear in a photograph. 6. The Flashlight and how to use it. 7. Series of Lantern Slides showing Hand-camera Work in its various phases. Admission is free to the lecture.

**A CHARGE OF STEALING NEGATIVES DISMISSED.**—At the Thames Police Court, on the 7th instant, William Marshall, a photographer, of Devonshire-street, Hackney, was charged with stealing six photographic negatives, value 11. 16s., the property of Harry Randa, photographer, of Garden-street, Shadwell. The prosecutor, in the course of his evidence, stated that he had known the accused some time, and about five months ago witness missed the nega-

tives from 28, Jubilee-street. At that time Marshall constantly visited the premises. About a fortnight ago witness heard that some of the negatives were being exposed for sale in a shop in Whitechapel-road, where the accused had a studio, and he went and asked him how they came into his possession. Marshall replied that the negatives were given to him by William Read some years ago. Witness replied that that could not be, and that they were his property. He then said to accused, "If you return them at once, I won't press the charge; but, if you don't, I shall charge you." The magistrate: "In other words, you said you would compound a felony?" Witness further stated that, as accused did not return them, he gave him in charge. Replying to Mr. Phelps, who appeared for the defence, witness said he had seen the negatives, and those in the case were prints from them. On being pressed, however, witness admitted that he had not seen the negatives. One of the negatives was that of a barmaid he particularly wanted (laughter). Witness further admitted that in June last he gave prisoner two negatives, and he might have also given him mounts. He sold accused an engraving of the late Mr. Gladstone for 10s. 6d. On Friday last he sold prisoner's partner a pawn ticket for the lens. Mr. Dickinson, in discharging prisoner, advised him to give up the negatives he had in his possession.

THE firemen had a most difficult and dangerous task to contend with just before half-past one o'clock on Thursday morning, January 5, a fire breaking out in the premises of the London Stereoscopic and Photographic Company Limited, 54, Cheapside, E.C., two doors from Bow Church. The premises consist of a lofty warehouse of seven floors, extending about twenty yards in one direction, and running back about a third of that distance in another. The City Police constables patrolling the immediate neighbourhood discovered dense volumes of smoke pouring out of the basement, and it was soon apparent that a serious outbreak had originated in the stores, in this part of the warehouse, and was rapidly increasing in strength. Not a moment was lost in raising the alarm, and the firemen who were on night duty in Aldersgate-street, opposite the General Post Office, were apprised of the outbreak, information of the fire was also conveyed by a stranger to the brigade station in Watling-street, and in a very few minutes a number of ladders and steamers from Whitefriars, Clerkenwell, Whitecross-street, Bishopsgate-street, and Southwark-bridge-road, in addition to the Watling-street corps, were on the scene of the outbreak. The large body of firemen were under the direction of Commander Wells, R.N., the chief officer of the brigade. The smoke issuing from the basement was unusually dense, and was strongly impregnated with chemical fumes. These conditions, coupled with occasional explosions, prevented the firemen from getting at close quarters with the fire, and consequently their efforts for some time were unavailing, and considerable anxiety was caused to the various chiefs. Although the shop was well alight and full of smoke, it was found necessary to force an entrance into it, and cut away a large section of the flooring. Under the direction of Commander Wells, this operation was successfully performed, and by this means the origin of the fire was made accessible to the water. Five steamers were now in full working order, and at once set to work on the fire in the basement, which was glowing like a furnace, the result being that immense quantities of water were poured every minute through the apertures in the flooring. This system was eminently successful, and, after one hour's hard work, all cause for alarm was removed. The front part of the large basement was practically gutted, and its valuable contents destroyed. The back basement and the shop were badly damaged by fire, and the rest of the building suffered from the effects of heat, smoke, water, and breakage. For a considerable time after the flames were extinguished volumes of smoke curled up from the smouldering debris, and it was not until eight o'clock that Commander Wells felt justified in calling off his men. The damage wrought by the fire itself is not so extensive or costly as that done by the smoke, water, and breakage. A rough estimate places the damage at between 3000*l.* and 4000*l.*, which is covered by insurance in the Sun and North British and Mercantile Offices. The business of the firm is being carried on temporarily at the back of the building. The cause of the fire was at the time of writing unascertained. The following is the official report sent by Commander Wells to the London County Council: "Called at 1.37 a.m. at 54, Cheapside, City, E.C., to the premises of the London Stereoscopic and Photographic Company, Limited, and building of seven floors, about fifty feet by twenty feet; front basement, used as a store, and the contents nearly burnt out; back ditto, and the shop and contents damaged by fire; rest of the building and the contents damaged by heat, smoke, and breakage; 55, ditto, ditto. A. J. Jones, Limited, tobacconists, building and the contents slightly damaged by smoke, heat, and breakage. 1, Bow Church-yard, ditto, Mr. Gulliver, tailor, building and the contents damaged by smoke, and the doors broken open. 5, ditto, Copstake, Lindsay, Crampton, & Co., warehousemen, basement and the contents slightly damaged by water, and the rest of the building and contents by smoke."

## Patent News.

THE following applications for Patents were made between December 27 and December 31, 1898:—

**LANTERN SLIDES.**—No. 27,352. "Improvements in and relating to Magic-lantern Pictures." R. J. W. DOWN.

**ORTHOCHROMATICS.**—No. 27,373. "Improved Means Applicable for Use in Orthochromatic Photography." R. W. ARLETT.

**OPTICAL LANTERNS.**—No. 27,448. "Improvements in Optical Lanterns and other Apparatus for Displaying Advertisements and other similar purposes." H. PIERPOINT.



## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
16.....	Barnet and District .....	Lecture.
16.....	Bradford Photo. Society .....	Annual Meeting and Election of Officers.
16.....	Camera Club .....	Prehistoric Remains in Greece. Horace Brown, F.R.S., &c.
16.....	Kingston-on-Thames .....	Outlines of Photoculture. H. Wallich.
16.....	Richmond .....	The Camera and the Wheel. F.O. Bynoe.
16.....	South London .....	Excursions 1898. J. T. French.
17.....	Bootle .....	Exhibition of Slides from Negatives by J. H. Spencer. H. Wolff.—Presentation of Medals to Winners in Recent Competitions.
17.....	Croydon Microscopical .....	Annual Meeting.
17.....	Gospel Oak .....	Architectural Photography. C. Stone.
17.....	Hackney .....	Pictorial Photography. Jno. H. Gear.
17.....	Leeds Photo. Society .....	In Wordsworth Country. Percy Lund.
17.....	Royal Photographic Society .....	On some New Half-tone Screens of English Manufacture. J. E. Johnson.
18.....	Ashton-under-Lyne.....	A Rumble through the North of the Emerald Isle. Jos. Hutchinson.
18.....	Brentford .....	Carbon Printing. W. Taylor.
18.....	Croydon Camera Club .....	Thirty-eighth Public Lantern Show: Australian Natural-history Subjects. W. Saville-Kent.
18.....	Darwen .....	Prize Slides.
18.....	Leeds Camera Club.....	Platinotype Processes. Rev. J. Beauland, M.A.
18.....	Southsea .....	Photographic Optics. A. H. Summers, M.A.
18.....	Woodford .....	Mounting, Framing, and Kindred Matters. J. T. Ashby.
19.....	Bolton Mutual Photo. Society .....	Demonstration. Mr. Roscow.
19.....	Camera Club .....	Modifications of Photo-stiching. E. Sanger Shepherd.
19.....	Leigh .....	Competition: Negative with Print.
19.....	Liverpool Amateur .....	The Magic Carpet. E. Rimbault Dibdin.
19.....	London and Provincial .....	Development of P.O.P. T. E. H. Bullen.
19.....	Oldham .....	Velox Printing Papers. W. J. Belton.
20.....	Croydon Microscopical .....	Lecture: A Trip on the River Bure in Norfolk.
20.....	West London.....	Lantern Night: North country Life and Scenery. Edgar G. Lee.
21.....	South London .....	Annual Dinner.

### ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 10.—Ordinary Meeting, Captain W. de W. Abney, C.B., F.R.S., D.C.L., in the chair.

#### BUSINESS MATTERS.

A large number of candidates for membership were elected, and it was announced that nine members had been admitted as Fellows.

The CHAIRMAN stated that the following societies had been admitted to affiliation: Sefton Park Photographic Society, Hastings and St. Leonards Photographic Society, Yorkshire Philosophical Society (Photographic Section), Edinburgh Photographic Society.

#### ELECTION OF SCRUTINEERS.

The following members were elected to act as Scrutineers at the forthcoming election of Council and Officers: Messrs. J. Bulbeck, — Butt, E. Clifton, J. R. Gotz, W. B. Booker, E. Crofton, J. H. Agar Baugh, E. Sanger Shepherd, T. Sebastian Davis, R. Beckett, — Bennett, and H. C. Rapson.

#### THE LATENT IMAGE AND ITS DEVELOPMENT.

Mr. C. H. BOTHAMLEY, F.I.C., F.C.S., F.R.P.S., read "Some Remarks on Recent Papers concerning the Latent Image and its Development," in which he discussed in detail the recent paper of Messrs. Hurter & Driffield's latent image, Mr. Bothamley first expressed his surprise at their admission that the error of speed determination might be so large as thirty per cent. Alluding to their statement that their work indicated that, under certain circumstances, "the density ratios of the visible image cannot be said to be constant," he said that this clearly amounted to an admission that photographers had the power of altering the gradations by altering the mode of development, which was directly opposed to the original dictum, afterwards strongly emphasised, that the density ratios were unalterable. With regard to that part of the paper in which the thermo-chemistry of development was discussed, Mr. Bothamley called attention to the table showing the amounts of energy to be supplied in order to reduce halogen silver salts when certain alkalis were used, and said the conclusion arrived at, that on an average only three units of heat more were required when alkali carbonates were employed, than when caustic carbonates were used, was obviously incorrect. Caustic alkalis and alkali carbonates, when used in quantities proportional to their chemical equivalents, were equivalent only in their power of neutralising acids or displacing acid radicals from certain salts, and they were certainly not equivalent in reactions

of other kinds, including those occurring during development. Turning next to Messrs. Hurter & Driffield's main reasons for arriving at the conclusion that the action of light was not to produce a chemical decomposition of the silver bromide, but to bring it into a condition in which it was more amenable to the reducing action of the developer, the speaker criticised those reasons one by one in considerable detail, and endeavoured to show that there was nothing in the authors' observations which could be regarded as invalidating the ordinary chemical theory of the constitution and formation of the latent image, but that, on the contrary, they were in entire agreement with it. The chemical theory was defined as follows: The latent image consists of silver sub-bromide. When a plate is exposed to light, an extremely minute quantity of the silver bromide is converted into silver sub-bromide, the bromine which it loses combining with the gelatine that is in intimate association with the silver bromide in the emulsion; and it followed that the latent image was really a mixture of silver sub-bromide and bromised gelatine. In connexion with recent observations as to the possibility of developing an image on exposed plates from which all the silver bromide had apparently been removed by means of a fixing bath, Mr. Bothamley pointed out, after a full examination of the circumstances, that there was nothing in them to weaken the view which he held as to the chemical nature of the latent image, but that they actually strengthened that theory. He concluded a long and very exhaustive discourse by a consideration of Dr. Andersson's latest paper on the relation between the developing power of substances and their chemical constitution, criticising the validity of non-photographic methods of comparing the relative energies of different developers.

Mr. CHAPMAN JONES was rather in favour of the physical theory of the latent image, but at the same time there was no definite proof either way, and the facts might be as well explained on one hypothesis as the other.

Mr. W. E. DEBENHAM thought that the statement that the ratio of intensity could not be altered by development, which had been reiterated by many who were now convinced that it was a mistake, should be publicly withdrawn by them if they were convinced that it was erroneous.

Mr. J. CADETT favoured the physical theory of the action of light on the plate, and expressed himself as sceptical with regard to the existence of the sub-bromide of silver, which could not be produced by any ordinary chemical means.

The CHAIRMAN, owing to the lateness of the hour, closed the discussion with the remark that he would not enter into the question of the theory of the latent image, but that, if the physical theory were correct, there would be no need of sensitisers.

Mr. BOTHAMLEY then very briefly replied, and the proceedings were concluded by the passing of a hearty vote of thanks to him.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 5.—Mr. S. Herbert Fry in the chair.

Mr. PHILIP EVERITT repeated a number of questions put to him recently on optical matters: Whether it told against the working power of a lens in reducing as compared with copying same size? on roundness of field, depth of focus, &c.

The questions were such as to call forth the best debating powers of the members, and the matters at issue were fought out upon the blackboard with much earnest attention on the part of those possessing the necessary qualifications.

Mr. HADDON said that photographic lenses were not constructed in a manner to yield microscopic definition, and, when one came to reduce considerably with them beyond their defining power, the reproduction suffered. It was a question of the quality of the curves, but it was as well to know that one could not diminish as much as one liked and still get perfect definition.

Mr. PARFITT thought that, when working at a large size as compared with a small one, the advantage of a longer focus was obtained.

A question was asked by a member as to the solubility of ferric oxalate in water. One authority, he said, gave it as not soluble except with excess of oxalic acid, another worker said that it was very soluble, and a third gave it as soluble. The speaker now stated that it was one of the most soluble salts to be met with, and with this view Mr. HADDON concurred.

### PHOTOGRAPHIC CLUB.

JANUARY 4.—Mr. E. W. Parfitt in the chair.

A discussion took place on the advantages and disadvantages of toning chloride prints after fixing, as compared with the usual method, and as to the reason for the custom of toning prints before fixing.

The CHAIRMAN pointed out one obvious advantage of the less common method, namely, the fact that one need only tone to the depth which it was required that the print should possess when finished, seeing that there was no subsequent fixing action to interfere with the colour of the print.

Mr. W. R. STRETTON added that the tones, too, were more even in these prints toned after fixing. He made use of this variation of toning methods a great deal, and thought it curious that more people had not tried their hands upon it.

Mr. W. D. WELFORD said, however, that there was the disadvantage that it was much more difficult in practice than the universal method of toning prior to fixing.

Mr. A. MACKIE spoke of the platinum toning of chloride papers. Some papers did not lend themselves well to platinum alone, but he had got on such papers very pretty tones by treating them with a platinum toning bath for a time followed up by a gold bath.

Mr. WELFORD stated, in this connexion, that the Paget matt P.O.P. would tone to almost any colour within the platinum range with platinum alone. This was the only paper he knew of which he could say this.

Mr. FOXLEE, extending the scope of the question, said he preferred to stand



by albumen paper, and, failing that, collodio-chloride, rather than gelatine papers.

Mr. F. A. BRIDGER championed the cause of the albumen print. He thought that ideal prints on any paper, compared with a thoroughly good albumen print, would not approach the latter in excellence.

Mr. H. VIVIAN HYDE spoke of his experiences with persulphate of ammonia as a reducer. He had worked with it very successfully; it reduced the image in the high lights without affecting the shadow detail and half-tones, and was practically a local reducing agent. He and Mr. MACKIE spoke very favourably of this, the latest of MM. Lumière's production.

**Hackney Photographic Society.**—January 3, the President (Mr. E. Puttock) in the chair.—The meeting was occupied with a discussion on various subjects, in the course of which Mr. HENSLEY, referring to a recent recommendation to use amidol combined with pyro as a developer for under-exposures, said that he had recently tried it with great success. To 2 ounces of ordinary pyro-soda developer of half strength he had added about  $1\frac{1}{2}$  grains of amidol, plus a little sulphite of soda. This produced a very energetic developer, which seemed to get all possible detail out of a negative. The meeting closed with an exhibition of members' slides.

#### Leeds Camera Club.

##### EXPOSURE AND DEVELOPMENT

was the title of a lecture delivered on Wednesday, the 4th inst., by Mr. R. CHILD BAYLEY, editor of *Photography*. The lecturer drew attention at the outset to the need, which all science had, of a definite basis for accurate measurement if real progress were to be achieved. This held good in photography, as much as in astronomy or chemistry, and the want of some such basis had been early felt. After an historical sketch of the sensitometer and plate-speed measurement, a standard of sensitiveness being the point sought for, the lecturer described briefly the methods advocated by Claudet, Hunt, Vogel, Spurge, Warnerke, and others, and the researches in this direction of Captain Abney. The labours of Hurter & Driffield formed the principal feature of the lecture, an attempt being made to explain their definition of a perfect negative, and their method of speed determination and its results, without having recourse to mathematical language. Mr. Bayley showed, by means of sketches on the blackboard, how a certain subject produced different densities in the film of the negative, and how, if a correct representation of the subject on the resulting print was to be obtained, a correct exposure, as well as a correct development, was absolutely necessary, and, further, that it must be suitable to the printing process to be employed. A print should reflect to the eye an amount of light proportional to the amount reflected by the subject, and but one type of negative was capable of yielding a print which complied with that condition. In conclusion, Mr. Bayley said that, by using a standard light and a standard developer, a measured plate could be developed without being looked at to get a definite result, and for another batch of plates of a different factor of sensitiveness a proportional amount of exposure and development would yield practically identical results; and it was largely due to the researches of Messrs. Hurter & Driffield that these factors had been reduced to exact measurements. Photographers owed to them a debt in respect to the quality of the plates now obtainable that could never be over-appreciated.

**Sheffield Photographic Society.**—January 2, the President (Mr. Tomlinson) occupied the chair.—After the transaction of ordinary business and the election of a new member, a practical demonstration was given by Mr. W. J. BELTON on the new

#### VELOX PRINTING PAPER.

The lecturer commenced by explaining the various results obtainable by using papers varying both in surface and rapidity. A distinguished feature of the paper is that, whilst the half-tones are clearly rendered, there is no blocking up of the shadows; the image, being more on the surface, gives better definition, and is less mealy in appearance than other papers of a similar nature. One cause of failure, the lecturer explained, was not using the acid fixing bath, most amateurs using the plain hyposulphite of soda, which, after fixing a few prints, has a tendency to deteriorate those fixed subsequently. Any of the newer developers may be used, but a combination of metol and hydroquinone gives the best result, and must be three or four times the strength of that used for plates. Mr. Belton then proceeded to make prints from his own and from members' negatives, and, although the room was well lighted, all the manipulations were carried on in ordinary gaslight. The exposure is made to an ordinary gas burner, the time varying according to the colour and density of the negative. Development was effected by means of a brush, and so manipulated as to develop locally or otherwise, according to the result desired. Another prominent feature of Velox paper is that warm, cold, or red tones may be obtained by development or toning in the hot hypo or alum bath. Sample prints showing the various colours obtainable on the rough, glazed, and matt surface papers were shown, and handed round for inspection, and others exhibited on the walls called for general admiration. Some discussion ensued, after which a hearty vote of thanks was accorded Mr. Belton for his highly instructive and interesting demonstration.

#### FORTHCOMING EXHIBITIONS.

1899.

- January 25-31..... Perthshire Society of Natural Science. C. F. S. Burrows, Hon. Secretary, 16, Princes-street, Perth.  
 „ 30, 31..... Southsea Amateur. F. J. Mortimer, Cornwall House, Ordnance-row, Portsea.

- February 4-25..... Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, 2, George-street, Edinburgh.  
 „ 13-18..... Photographic Society of Ireland. Hon. Secretary, 35, Dawson-street, Dublin.  
 „ 21-24..... Hastings and St. Leonards. Exhibition Secretary, A. Brooker, 21A, Wellington-place, Hastings.  
 March 4-11 ..... South London. Hon. Secretary, A. E. Allen, 27, Princes-square, Kennington Cross, S.E.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### STEREOSCOPIC PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—Mr. Penlake's remarks are always sensible and interesting, and I thoroughly agree with him that  $6\frac{1}{2} \times 4\frac{1}{2}$  (double quarter-plate) is on all accounts the best possible size for stereo work. Its great advantages have often been pointed out. For instance, we may use two quarter-plates, and thus save the trouble of cutting the negatives, or we may use a full-size plate when we desire one large picture. The  $6\frac{1}{2} \times 4\frac{1}{2}$  plate size has not those advantages, and for all-round work we do not gain much by using this size in preference to double-quarter plate. If we use  $6\frac{1}{2} \times 3\frac{1}{2}$  there is a difficulty in getting suitable plates everywhere, and, besides, the negatives require cutting in two. For the all-round worker who desires to combine lantern quarter and half-plates there is nothing better than  $6\frac{1}{2} \times 4\frac{1}{2}$ ; it is the ideal size, not too large to be awkward, not too small to be limited in its capacity for all-round work.

There is one great difficulty in the way of would-be workers with  $6\frac{1}{2} \times 4\frac{1}{2}$  size, and that is there are practically no manufacturers enterprising enough to make this one of their usual sizes, and it is very difficult to get either cameras or dark slides when required, though, from my knowledge of amateur photographers, most of them would prefer it to the present half-plate size, chiefly because of the facility in using quarter-plates at will as well as double quarter.

When using single quarter-plates it is well to put them in the slide in sheaths, as with the ordinary type of book from dark slides they are somewhat apt to slip behind each other.

The solid form of slide is, even for ordinary use, much neater than the old book-form type, and it is easier to fill and empty.

I am quite persuaded that the future is with stereoscopic photography. It will yet be used for ordinary illustrations.

Business firms will illustrate their catalogues stereoscopically, giving the customers practically the advantage of seeing the goods before buying them; ordinary flat illustrations are far from clear.

What disgusts people with stereoscopic pictures are the rubbishy one shilling per dozen slides that are sold, some of those that I have lately examined are atrocious. On the other hand nothing is more beautiful than a good stereoscopic transparency, carbon or otherwise.—I am, yours, &c.,  
 W. J. FARMER.

### THE ROYAL PHOTOGRAPHIC SOCIETY'S COUNCIL ELECTION.

To the Editors,

GENTLEMEN,—The typical professional photographer will feel flattered in reading Mr. G. T. Harris's letter to the *Journal* last week, and also perhaps wonder what opportunities this gentleman has of ascertaining "the frame of mind of the typical professional photographer towards the Royal Society;" but, when he proceeds to state that the professional's estimate of the value of a F.R.P.S. is limited to its commercial aspect, surely a protest is necessary.

A gentleman who must claim an intimate knowledge of professionals in order to write in the *Journal* the sentence—"This, without doubt, represents the frame of mind of the typical professional photographer," &c., should do something more to justify the assertion than quote the remarks of an individual, and can have no reason for adding, *Ab uno disce omnes*! There are men in every sphere of life undeserving the outward symbols of honour they sometimes obtain—hypocrites in the church, thieves in the law, quacks in medicine; but who would venture to say of members of these professions, "From one you may judge of the whole!"

It seems to be the mood among a certain small section of photographers to represent the professional generally, and the portraitist in particular, as an individual of sordid motives, and even devoid of the elementary intelligence necessary to photograph, say, a mudbank, or expose a plate in the twilight! Is it not time this petty nonsense should cease, and the largest and best side of the profession—and not the un-



important and the worst—be encouraged to make its influence felt both in the press and in our exhibitions?

No one, who has an eye to see, can fail to note with regret that our exhibitions give the public a painfully inadequate impression of the present position of professional photography. And why is this? In traversing the leading fashionable thoroughfares of London, and the larger provincial towns, whose windows seem to attract the great crowd?—those of the leading professional photographers? How many of these are represented in our exhibitions, and why so few? One may imagine a reason is the rejection by the Judges of work upon which the greater public has often pronounced a favourable opinion. Professional men have sometimes seen in past exhibitions that eccentricities, and the more or less "accidental" effects in photography have been better received by the Judges than the carefully thought-out, well-balanced, well-lighted work of the studio, and what wonder if of recent years they have accepted the inevitable, and stayed away?

No one will gainsay the great value and artistic influence of a certain section of amateur contributors to the exhibitions; but surely it is apparent that there is room for studio photography as well as the monologue on *Misty Mornings* and *Dying Days*.

Portraits are more than ever a photographic "power in the land." It is their work which gains universal notice, if we except perhaps the limited areas occupied by the photographic exhibitions.

It would therefore seem to the public interest that the professional should receive greater encouragement at the Society exhibitions and increased opportunities for comparison and the raising of that spirit of emulation so essential to all high endeavours, and the portraitist considers his special work makes the greatest demand on the skill of a photographer.

It is one thing to be a lover of nature, possessed of illimitable leisure, independent of monetary cares, and another to be a hard-worked professional, face to face with a great and exacting public—a public which demands instant evidence of artistic taste and tact and posing, allows no preliminary reveries, and seldom provides the picturesque element *ready-made*.

Probably the conditions which make for success as a professional and success as an exhibitor (under prevailing conditions) are not quite the same; but, if the commercial test is greatly at variance with the verdict of Exhibition Judges, does it not imply that the public are interested in much photography which our present arbiters care little about? And we have seen by the business careers of several men of exhibition fame that it has been easier for them to attain distinction at the exhibitions than to take an important position in the ranks of the professional workers they have subsequently joined.

If this is so, does it not prove that the professional requires special abilities, that these abilities are recognised in a practical way by the public? and, if so, why not by the Exhibition Judges?

Perhaps the forthcoming election may help to decide this question more equitably towards those members of the Royal who are not only attached to the Society for itself, but because it so largely represents the professional backbone of the country, and should control their special professional interests in the matter of its Exhibition. I am, yours, &c.,

Studio, 8, Regent's-terrace, Hull.

T. C. TURNER.

#### BUTLER'S SINGLE OR STEREOSCOPIC COLOUR CAMERA.

To the Editors.

GENTLEMEN,—My attention has been drawn to an article in your edition of December 30, giving a description of an instrument which is called "Butler's single or stereoscopic colour camera." I should be obliged if you would allow me to state in your valuable columns that this is an infringement of one of Mr. F. E. Ives's patents.—I am, yours, &c.,

THE PHOTO-CHROMOSCOPE SYNDICATE, LIMITED.

WILLIAM A. J. HICKES, Secretary.

Holbein House, 121, Shaftesbury avenue, London, W.C.,  
January 5, 1899.

#### THE ITALIAN EXHIBITION.

To the Editors.

GENTLEMEN,—Referring to my letter of 9th ult., which you kindly inserted in your paper, in which I called attention to the forthcoming International Exhibition of the Società Fotografica Italiana, I am now empowered definitely to inform you that the Society has decided on organizing an Invitation Section for British pictorial photography.

Within a few days the invitations will be issued to those selected to receive them, who I sincerely hope will contribute examples of their work, in order that the collection may prove a typical exposition of the progress and position of the British School. It is extremely desirable this should be so, for, strange to say, in Italy, the Home of Art, but little progress has been made in the direction which we have here taken. Our Italian friends express a very keen desire to have an opportunity of seeing and profiting by a representative collection of British work, and will, I am sure, appreciate not only the work itself, but also the goodwill of assisting contributors. I have arranged that all pictures sent in response to the special invitations shall be received in London, packed,

forwarded to Florence, and returned to London, free of expense to exhibitors.

The Special Section does not interfere in any way with the desires of those who wish to send exhibits to any of the other sections, a general programme of which has been distributed in the usual way.—I am, yours, &c.,

HENRY E. DAVIS.

Camera Club, Charing Cross-road, W.C., January 7, 1899.

#### PURIFICATION OF ACETYLENE.

To the Editors.

GENTLEMEN,—I notice in your issue of the 6th inst. you report that Dr. A. Frank has obtained a German patent for a process of purifying acetylene by a chemical mixture. I think it only fair to point out that Messrs. Thorn & Hoddle patented an apparatus, also a purifying material, which has been on the market over nine months. It does everything that Dr. Frank claims for his material.—I am, yours, &c.,

169, Southampton-street, Camberwell, S.E.

WILLIAM F. SLATER.

#### THE PHOTOGRAPHIC CLUB'S ANNUAL CONCERT AND LADIES' NIGHT.

To the Editors.

GENTLEMEN,—I have to inform you that our Annual Concert and Ladies' Night will be held on the 18th inst., when the musical portion of the entertainment will be entirely by professionals, and the whole under the direction of Mr. E. A. Newell.

Tickets will be forwarded to every member, and any remaining will be sent to those requiring them in the order of application to—Yours, &c.,

W. R. STRETTON, Hon. Secretary.

4, Queen-street-place, London, E.C., January 9, 1899.

#### SOUTHSEA AMATEUR PHOTOGRAPHIC SOCIETY'S ELEVENTH ANNUAL EXHIBITION.

To the Editors.

GENTLEMEN,—I shall be much obliged if you will kindly note in the columns of your next issue that the latest date for receiving exhibits in the open classes for amateurs and professionals in our forthcoming Exhibition is January 26.—I am, yours, &c.,

10, Ordnance-row, Portsea, Portsmouth. F. J. MORTIMER, Hon. Sec.

### Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

#### PHOTOGRAPHS REGISTERED:—

F. Holmes, Longleat, Warminster, Wilts.—Photograph of Longleat Winter Garden, Longleat, Wilts.

J. Smith, 4, Lansdown, Stroud, Glos.—Photograph of interior of St. Lawrence Church, Stroud, without dark shadow on altar.

E. H. SPAIGHT.—Much obliged for the suggestion. At present, however, it is impracticable.

F. E. R.—Send our publishers three prints and 1s. 7d., and they will effect registration for you.

A. Y.—Send our publishers three copies of each photograph, and one-and-sevenpence for each registration.

C. A. WAITE.—The address is Henry Gower, Photographic Copyright Union, London Chamber of Commerce, Botoolph House, Eastcheap, E.C.

E.M.S.—We regret we cannot tell you. The only suggestion we can make is that you advertise for some one to give you instruction in wax-modelling, and then adapt that to your requirements.

COLLOTYPE.—W. WALKER. "Where can I obtain full practical instructions for producing colotype pictures? Any information would greatly oblige, as I am quite ignorant in the matter."—At the Process School, B.Lit-court, Fleet-street, or at the Polytechnic, Regent-street, W.

STAINED NEGATIVES.—W. B. says: "A gelatine varnished negative with a platinum print on it got wet and badly stained. It was wiped over with weak acid (varnish not removed) and revarnished; this made things better, but the stain shows still. Would removing varnish altogether, treating with weak acid, now mend things?"—The only chance of getting rid of the stain is to remove both coats of the varnish, and then treat the film with acid, though we are not sure that it will now remove the stain. That treatment should have been resorted to at first.



**NERNST'S NEW ELECTRIC LIGHT.**—Rd. Smith says: "Can you inform me if Professor Nernst's new electric light is suitable for an alternating current?"—In reply: We are unable to supply any further information than that given in the paragraph. Some reader may, however, be able to help in the matter.

**G. W. S.**—Messrs. Dawbarn & Ward, 6, Farringdon-avenue, E.C., publish a little book on lantern-slide making by Mr. Coulthurst, and Messrs. Hazell, Watson, & Viney, Creed-lane, E.C., also have one by Mr. Hodges. These books do not treat of colouring, which you will find dealt with in Mr. Hepworth's *Book of the Lantern*, also published by Messrs. Hazell, we believe.

**W. ANDREWS.**—1. Messrs. Dawbarn & Ward, 6, Farringdon-avenue, E.C., will obtain the volume for you, price, we think, 2s. 2. We do not give the addresses of contributors. Send us a stamped, addressed letter and we will forward it to him. 3. We cannot spare space just now. Years ago the subject, now practically out of date in this country, was dealt with over and over again in the *JOURNAL* and *ALMANAC*, to back volumes of which we must refer you.

**STUDIO TROUBLES.**—INTEREST says: "Am much taken with article by Mr. F. Whaley on 'Studio Troubles' in *ALMANAC* for 1899, p. 778, but he is too brief for my dull comprehension. You will oblige by answering the following re above subject: 1. Is paper hung from all roof sash bars where twenty-four inches apart? 2. What width paper? 3. Is one edge fastened and the other allowed to hang vertical whole length of bar?"—In reply: 1. We should presume so from the article; it would certainly seem advisable. 2. The width of the sheet. 3. Yes.

**FORMULA.**—A. C. COLLIS says: "In going through your welcome Annual, I find, in 'Practical Notes and Suggestions of the Year,' a developer, viz.: Water, 1000 parts; pyrogallie acid, 28 parts; sulphite of soda, 350 parts; strongest sulphuric acid, 6 drops. For use, take 80 c. c. of solution and 80 c. c. of water, to which 8 c. c. of acetone had been added. I am in a fix. Will you, with your usual kindness, enlighten the ignorant, and give the above in ounces and grains, so that I can understand it? Thanking you in anticipation."—If you turn to page 638 of the *ALMANAC*, you will see a table of the French fluid measures and their equivalent in English ounces and drachms.

**MASKS; ACETYLENE.**—ARTHUR EDGAR asks: "1. Could you tell me where it would be possible to obtain masks similar to the enclosed? The print forwarded is produced from an American photograph. 2. Also, could you give me any instruction as to portraiture by the acetylene light; or, failing this, could you tell me where I could get such information?"—1. No, we cannot; but such masks are easily made by taking a negative of the frame against a tolerably dark background, and using that as the mask. The negative may be made on a celluloid film, and thus save double-printing. 2. Better write to Messrs. Thorne & Hoddle, Totill-street, S.W. They make a speciality of acetylene light for photography.

**EMULSIONS.**—H. B. If you follow out Abney's instructions, you should not fail to get what you require; but it must be borne in mind that plates equal to those now on the market cannot be expected to be made with a few dozen experiments. Their perfection has been arrived at only after years of constant practice and research. To answer all the six queries, and some of them are still vexed points, so as to be of practical value, would take up much more space than we can afford in this column. As we have just said, Follow the instructions given in Abney's book, and with more experience you will, doubtless, produce good plates, but do not work on too small a scale. A great deal appeared on gelatine emulsions in the volumes of the *JOURNAL*, 1879-1885. Almost every number contained something on the subject.

**TRAVELLING.**—VOYAGER asks: "Will you kindly state whether duties are exacted upon cameras carried into Italy by tourists? If you carry a camera and several dozen British or American plates, will there be inspection (i.e., opening), and will duty be charged? If so, what is the rate? Going into Switzerland, Germany, or France, is there a duty upon them? Which cities of Switzerland and France are likely to have dealers with stocks of fresh 6½×8½ and 5×4 plates?"—No duty is charged in any of the countries named. The plates will not be examined if they are duly labelled as photographic plates, which must not be exposed to light, and a polite intimation to that effect given verbally at the Custom-houses. The plates are stocked in all large towns, though, unless of English make, possibly not the exact sizes named.

**LENS—DEVELOPMENT—PRINTS.**—TADROUS HANNA (Egypt) asks: "1. How long must be the distance between Dallmeyer's stigmatic lens, series II. (patent) and the person for producing the largest cabinet but without exaggerating the perspective? 2. How long must be the distance between Dallmeyer's No. 2 a *carte-de-visite* or portrait lens (patent) and the person for producing the largest *carte-de-visite* bust without exaggerating the perspective? 3. Which is the highest degree of heat allowed to pyro-soda solution without making fog on the plate during development in summer? 4. I am obliged during summer to mount P.O.P. after drying. Is there any way for making prints dry straight and not hard, as when got out from printing frame? I used glycerine, but without good results."—In reply: 1 and 2. The stigmatic lens does not exaggerate the perspective, but, in common with all lenses, the nearer it is approached to the subject the more violent, yet true, is the perspective. From 12 to 20 feet from the sitter gives the most pleasing results. 3. It will entirely depend upon the character of the plates. Some will bear a much higher temperature than others; indeed, this varies even with different batches of the same brand of plates. 4. The best plan is to squeeze them down on to ferrotype or glass plate, previously treated with French chalk, when taken from the washing water, and allow them to dry on that.

**LENS.**—GOLFER says: "1. I have a lens which was sold to me as a Voigtlander Portrait, with rack and pinion, 4¼-inch diameter front lens 4 inch back, marked and numbered as per facsimile sketch. Who is the maker? 2. It is 20½ inch focus; the diaphragm opening is 2½-inch diameter. What is the U.S. number? 3. Could it not be made to work with a larger apparatus, and thus be made quicker? 4. Could it be made a shorter-focus lens by any means?"—1. The lens is not by Voigtlander, but of French make, though for the moment we do not remember who. It is of ancient date. 2. Roughly, f/8. 3. Probably the lens will not bear a larger aperture, as makers, as a rule, sand out their lenses with the largest aperture they will give good definition with. You might, however, remove the fixed diaphragm and see the effect. 4. No, except by reworking the glasses.

**PLATINOTYPE.**—C. O. & D. write: "In the course of a year I turn out some thousands of platinotypes for my employers, but I am greatly troubled by the meanness of the prints when finished, and, after having given the matter due consideration myself, I thought you might be able to help me out of my difficulty if I briefly set forth my method of working. Commencing with a fresh tube of the Platinotype Company's cold-bath paper, I cut up my paper to size, dry my indiarubber pad (which I place next to the paper) and my other pads and also the negative. Having exposed my paper, I take from my stock solution of oxalate developer (made up of 54 ozs. of water to 1 lb. of oxalate of potash) whatever I require for the day's work. I use it at a strength of 1 part oxalate to 3 parts water. I then pass my prints through this solution in the usual way, but, in spite of the utmost care, I get meanness in the prints more or less. At first I thought my pads were not dry enough, and I paid special attention in this direction. I have tried all practicable ways of making up my developer. The meanness appears directly the prints have passed through the solution, which I have tested for acid, and it shows no trace of it. I use my developer for cold bath at a temperature of about eighty degrees. Having told you this, you may be able to tell me something to remedy this great drawback to producing really good prints."—The only suggestion we can make is that the paper has been allowed to absorb moisture before it is printed.

**PLATINOTYPE.**—PRINTER writes: "Would you kindly answer the following? Have been most grateful for your help at other times. We use the Platinotype Company's A A paper, and several times on receiving a fresh batch of paper, or starting a new tube, we have been greatly annoyed to find lines running through, such as seen in coarse note paper. They appear during the printing, and sometimes disappear whilst developing, but at other times (perhaps the next print developed) showing very much all through, rendering the finished print useless. We have written to the Company, but they only remark it is bad development; but I have called my fellow-workmen's attention to these lines before the print is more than half off the negative, so that it cannot be overprinting that does it, and I don't know how the developer is at fault long before the print is anywhere near it. It is not dampness, as it is only with very fresh paper this happens. The Company also say, if we send them two or three undeveloped prints with the lines showing, they will develop them, to prove the defect can be remedied, but they don't send any instructions to help us in doing away with the defect. Can you advise us what to do? The lines run only one way in the cabinets, as the paper is cut to stretch lengthways, in cabinets the lines running horizontally through them, and the *cartes* are cabinets cut in two and turned round so as to stretch in width, the lines running from top to bottom. It is a great worry to me, and I do sincerely hope you will help me. The enclosed print is by no means the worst example I have had to deal with."—As the Company can avoid the lines in the development, no doubt, on a polite request, they will tell you how to do it.

**RELIEF PHOTOGRAPHY.**—W. A. G. says: "As several articles have lately appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY on photographic reliefs produced by gelatine and bichromate, one in the issue of the current week, I should be greatly obliged if you could tell me whether the process is open to the profession or not. I had been experimenting, and had produced a modification of my own which would, I believe, serve to turn out relief work (busts) at a moderate cost, when, chancing to look over THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1896, I saw, on page 844, an account of a patent which put a stop to further experiments. My idea was to make a plaster intaglio, as described, and use this as a mould, taking a reversed carbon print, produced by the simple transfer, pressing this into the mould, filling up with paper pulp, and allowing to dry in posit on. This is the outline, omitting details. The results of my rather rough attempts were certainly encouraging. I wish to know if I may work this and other similar processes, and whether my own process can be and is worth protecting? The black-and-white process mentioned twice lately in the *JOURNAL* is, I believe, unworkable, as the lamp-black compound does not bring out the picture, but simply effaces what was already there. I have tried the process several times, drying the print, as directed, as also partially drying it, which latter produced something a little more like a picture. While writing, I should like to ask why the new *ALMANAC* cannot be obtained through the booksellers at published price? I have had no difficulty till this Christmas."—In reply: The process, in our opinion, is quite open to the profession, notwithstanding the existence of several "patents," the validity of which, as we have before remarked, we strongly doubt. We doubt whether your own process is sufficiently novel to be patentable, at any rate we do not think it worth protecting. Send our publishers the name of the booksellers referred to, and they will inquire into your complaint.

\*. Several answers to correspondents unavoidably held over.



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## EX CATHEDRÂ.

REFERRING to the correspondence at present appearing in our pages on the subject of the forthcoming election of the Royal Photographic Society's Council, we have been asked to give some indication, for the benefit of those residing at a distance from London, as to how a vote may be most advantageously cast. We do not think members can do better than vote for those of the old Council who stand for re-election. The outgoing executive is in thorough sympathy with the recently expressed desire of many to see the annual Exhibition conducted on broader lines than has recently been the case, and it would be wise of members to secure in this respect a continuity of policy, so that the desiderated improvement may assuredly take place.

\* \* \*

THESE remarks will serve to answer the esteemed correspondent who writes us: "I shall feel much obliged if you can let me know who are the men most likely to help the professional portraitist in the Exhibition question, because, after all, this is the keynote of interest among many members who are unable to attend the meetings. Last year's Exhibition

seemed to have gone to the dogs, it looked so painfully dreary; and it is really sad when one thinks and knows of the amount of good professional work which is being done all over the country. I believe there must be many members who, like myself, know next to nothing of the working of the Society, and who judge and value it only by results, without appreciating the inner causes. Can you not in some way indicate in THE BRITISH JOURNAL OF PHOTOGRAPHY (without giving offence) the lines upon which rival parties to office mean to run the Council. By some probable postal oversight or loss I have not yet received the *Journal* and ballot paper, or they may possibly enlighten me." The balloting paper is not yet issued.

\* \* \*

So far as we are aware, there are no "rival parties" seeking office. On the contrary, practical unanimity of feeling on most, if not all, points before the Society fortunately prevails. At the same time the remarks that have been made in our own pages and elsewhere with regard to the vital matter of the Society's Exhibition have, we believe, not been without a beneficial influence, and we quite expect to see next autumn that the "bread-and-butter" men will have a greater chance of showing their work than has lately been given them. Re-elect the old Council is our advice, failing the nomination of any persons obviously better fitted to conduct the Society's business. We hope our professional readers will avail themselves of their right of voting, and thus make their ideas felt in the matter.

\* \* \*

A MEETING of the Council of the Photographic Convention of the United Kingdom was held in London on Thursday, January 13. Mr. Martin J. Harding, whose labours on behalf of the Convention of the Shrewsbury meeting, of which he was local Hon. Secretary, will long be remembered with feelings of appreciation, was elected to fill a vacant seat on the Council. Dr. Hodges, representing the Gloucester Local Committee, was present at the meeting, before which a complete programme of the week's arrangements was laid. The principal excursions will be to Berkeley Castle on the Tuesday, Lord Fitzhardinge having very kindly granted members of the Convention exclusive privileges of photographing in the castle and grounds; on Thursday, a river trip on the Severn to Tewkesbury; and on Friday to Chepstow, Tintern, and Symond's Yat.



MEMBERS of the Convention will, we are sure, appreciate the alacrity with which Dr. Hodges and Mr. Dugdale (local Hon. Secretary) have got through the considerable preliminary labours incidental to the arrangement of the programme. The Mayor and Corporation have kindly consented to officially receive the Convention in the Guildhall, the large hall of which, capable of holding 700 persons, will be freely placed at the disposal of members during the week. The Bell Hotel will be headquarters. The Council appointed Mr. Sydney Keith to collect lantern slides for exhibition at the meetings, and Mr. Thomas Bedding was again deputed to secure papers for the evening meetings. The forward state of the arrangements justifies the expectation that the Gloucester meeting of the Convention will be very successful and enjoyable.

OUR contemporary, the *Daily Chronicle*, is responsible for the following remarkable story which, it adds, is agitating a section of society just now:—"A young lady of rank, who is engaged to be married to an officer serving in India, recently had her photograph taken by a leading London photographer before going out to India to be married. To her horror, when the photographs were sent home, there was plainly to be seen standing behind her, in a very menacing attitude, the phantom image of her *fiancé*! The young lady was photographed no less than three times, under apparently ordinary circumstances, but each time the same form is said to have appeared on the negative. The prospective bride has postponed her departure until inquiries can be made regarding this singular affair." We have read something not unlike this before. The supplementary figures, it is true, are usually alleged to be those of dead persons, but here the mysterious visitant is a living individual. In this respect, therefore, the story differs from the "usual thing" of the sort. It is noteworthy that these remarkable occurrences are seldom supported by such not altogether irrelevant details as dates, names of persons and places, and so forth.

MR. S. H. R. SALMON has sent to *Nature* a series of slides which, our contemporary says, are of great interest, since they appear to represent portions of lunar landscapes, and are astonishingly like the real photographs of them. "In fact, among all artificial methods of trying to produce lunar effects without the intervention of any hand work this is, as far as we know, the most successful. The process Mr. Salmon employs is very simple, and can be easily repeated by any one. It is only necessary to smear a little paste on to a glass slide, and gently warm it from below with a spirit lamp until it is dry. Observing it then with a microscope, we are confronted with this lunar-like appearance. The slides which we have before us represent many variations of lunar formations. In this one we see a small craterlet on the wall of a large crater, while in another we have rills widening now and again into craterlets. In a third slide we have a large crater, very like some on the moon, showing beautifully the gradation of tone on the surrounding wall. All the markings are, as Mr. Salmon states, perfectly accidental, and can be seen with the microscope."

MR. H. WALTER BARNETT, of 1, Park-side, Hyde Park Corner, S.W., writes us: "I send for your perusal the enclosed

wonderful composition, received by me to-day, and which, I think deserves a prominent notice in your widely read JOURNAL. I think you will agree that it is a highly humorous composition, and no doubt the author is delighted with his effort. The card from Paris came to hand a few days ago. It seems as though these would-be educators are inspired to do their deeds of glory by the evident success of the 'notorious M. Tanqueray' of free-portrait fame. In the interests of suffering British photography will you not raise your hand against these things?"

THE first of the curious productions to which Mr. Barnett refers comes from Bohemia, and is as follows:—"180 Splendid Attitudes. A photograph, should it produce an agreeable impression and please to all, must show the figure's posture unaffected and natural, suitable to the age and profession. Each photographer has not leisure and occasion to apply studies to this effect, and there are therefore photos which cannot pretend to be artistical. To meet this inconvenience, I have arranged from originals of renowned artists and from portraits of my own make a collection of 180 elegant attitudes, comprising pleasant motives and ingenious ideas. These 180 models are reproduced upon 20 tables, 9 upon each. They are most distinctly finished and sufficiently sized, so that photos made according to them have a surprising success. This collection contains charming attitudes of children, half and full-length portraits and groups, nudities and costumes being excluded. A complete collection of 20 tables (180 postures) is offered at the price of  $\frac{1}{2}$  £ only, and will be sent free if payment is effected in advance or against reimbursement. A specimen sent on demand free, if a five-pence stamp is enclosed."

The other, which comes from Paris, runs in the following terms:—"Art Studies. New ideas and effects in lighting, posing, and arrangement. Cabinets from the leading Parisian studios specially selected."

If any of our readers have received any of the specimens, we shall be glad to know their nature. The circulars are probably being distributed broadcast.

At a meeting of the Pharmaceutical Society, on Wednesday, January 11, the following were adopted as regulations for the keeping, dispensing, and selling of poisons within the meaning of the Pharmacy Act, 1868, in accordance with the provisions set forth in Section I. of the Pharmacy Act, 1868:—

1. That, in the keeping of poisons, each bottle, vessel, box, or package containing a poison be labelled with the name of the article, and also with some distinctive mark indicating that it contains poison.

2. Also that in the keeping of poisons each poison be kept on one or other of the following systems, viz.:—(a) in a bottle or vessel tied over, capped, locked, or otherwise secured in a manner different from that in which bottles or vessels containing ordinary articles are secured in the same warehouse, shop, or dispensary; or (b) in a bottle or vessel rendered distinguishable by touch from the bottles or vessels in which ordinary articles are kept in the same warehouse, shop, or dispensary; or (c) in a bottle, vessel, box, or package kept in a room or cupboard set apart for dangerous articles.



3. That, in the dispensing and selling of poisons, all liniments, embrocations, and lotions containing poisons be sent out in bottles rendered distinguishable by touch from ordinary medicine bottles, and that there also be affixed to each such bottle (in addition to the name of the article, and to any particular instructions for its use) a label giving notice that the contents of the bottle are not to be taken internally.

\* \* \*

FROM a communication that has reached us we are pleased to learn that our at-one-time excellent contemporary, the *American Journal of Photography*, which suspended publication at the beginning of the year, is to reappear forthwith. It will be conducted and published by Mr. Austin C. Leeds, of Philadelphia, while the editorial department will continue under the direction of Mr. John Bartlett. The management is independent of all controlling trade influence. It is announced that neither labour nor reasonable expense will be spared to secure whatever is of value—scientific, technic, mechanic, and artistic—to the expert or beginner. Recognising the importance of illustration, every effort will be made to render the *American Journal* pictorially interesting, and all the improved resources of photo-engraving and chromo-photography will be liberally made use of. It will be issued on the 15th of each month, and will contain forty-eight pages of articles. We wish our resuscitated contemporary success. There is great scope for independent photographic journalism in the States.

#### MODERN FALLACIES REGARDING ANCIENT METHODS AND PROCESSES.

PHOTOGRAPHY, this year, reaches the age of sixty, and the progress it has made during that period needs no comment whatever. The number of the old workers of the earlier processes and methods, unfortunately get fewer and fewer year by year; therefore, at the present ages, it is necessary that for the benefit of future generations the older methods of working should be correctly described when referred to, and not misrepresented, otherwise they will become misleading in the future.

Unfortunately, there is a propensity with some writers of the present day to commit themselves to print on subjects on which they are totally ignorant, and thus promulgate unwittingly fallacies that years hence may be quoted as facts. For example, we saw in a contemporary some time ago that a contributor described the Daguerreotype as an image on a silver plate "intensified with the bichloride of mercury." So far as we remember, this absurd description passed quite unchallenged, and thus at some future time may perhaps be quoted as a fact; who knows? If such things pass at the present time, what may not be expected in the next generation, if histories of photography are compiled, and such descriptions are utilised?

One very prominent fallacy amongst some at the present time is that the calotype and the waxed-paper processes are one and the same, for we frequently see written the "calotype or wax-paper process" when referring to paper negatives of the past, and we know that at one of the recent historical exhibitions some old calotype negatives were sent by their

present owners as being wax-paper ones. The error was, however, seen by the organizers, and the prints were shown under a right description. The calotype and the wax-paper processes are quite distinct from each other—quite as distinct in every way as are the wet and dry-collodion processes; in fact, the dissimilarity is really analogous. In the calotype process the paper is exposed wet, with the free nitrate of silver of the sensitiser upon it, and it has to be exposed within a short time of its preparation. In the waxed-paper process the free nitrate of silver was washed away, and the paper was dried before exposure, also paper could be kept for months after preparation. The former was a rapid process, while the latter was an exceedingly slow one; in fact, the conditions were quite analogous to those obtaining in the collodion processes, wet and dry. In the former of these the plates were exposed wet with the free nitrate of silver upon them, and were very sensitive. In the latter the free nitrate was washed off, and the plates could be kept for a long time, but they were then very slow. With this explanation it will be seen how fallacious it is to describe the calotype and the waxed-paper processes as if they were one and the same; also how misleading it may be to historians of the future.

Here is another fallacy that one sometimes sees in print, particularly since the "combined bath" has come into use for modern papers. In contemporary as well as in our own columns, though we have frequently pointed out the wide difference between the two, writers have assumed that the old sel-d'or and the old combined fixing and toning baths are one and the same. Only a fortnight ago, Mr. J. Pike, in suggestions to a correspondent for obtaining sepia tones on wet-collodion slides, says: "Of course, 'Colonial' has tried the usual toning solutions and the old sel-d'or combined toning and fixing bath." In saying this he was clearly unaware that there is just the same difference between the sel-d'or toning bath and the old combined toning and fixing bath as there is between the modern sulphocyanide toning bath and the modern combined bath method of toning and fixing. The sel-d'or, like the sulphocyanide, is simply a toning bath, and nothing more, the fixing being an after and separate operation.

Sel d'or—salt of gold—it may be explained, is a double salt of hyposulphite of gold and soda, containing one atom of the former salt to three of the latter, with four atoms of water of crystallisation. It forms needle-shaped crystals, and used to be sold in sealed tubes or bottles containing thirty or sixty grains each, as chloride of gold is now put up for sale. The favourite brand at that time was that of Fordos and Gelis, and it was first used for toning Daguerreotypes. The toning bath for paper prints—the ammonio-nitrate, or plain salted, it was not suited for albumenised—was made by dissolving the salt in the proportion of four grains to each eight ounces of water, and then slightly acidifying the solution with hydrochloric acid. The bath was then ready for use. After toning, the prints had, of course, to be fixed in a solution of hyposulphite of soda, and of the same strength as modern ones toned with the sulphocyanide bath have to be. Sometimes, instead of employing the commercial crystallised salt, an extemporary sel-d'or bath, made as follows, was used:—Chloride of gold, 1 grain; hyposulphite of soda, 3 grains; hydrochloric acid, 4 minims; water, 4 ounces; the fixing of the prints being the same, as a matter of course, as when the crystallised salt was used.



Why two old methods of working so widely different should ever have become confounded as being one and the same it is difficult to conceive. Possibly, however, it may have arisen, in the first instance, from the fallacy of a single writer, ignorant of his subject, and perpetrated by others since. Whatever be the reason, it, however, proves that fallacy promulgated at the present time may be accepted as facts in the future. So much the worse for the true history of photography in the future.

**Extra-fine Ground Glass.**—M. Beans suggests the following method of making extremely fine ground glass: A 4.5 per cent. solution of gelatine is prepared, to which from 3 to 6 per cent. of potassium fluoride is added, and, with this, coat the sheet of glass of the required size; allow to dry thoroughly, and then immerse for thirty seconds in a mixture of hydrochloric acid 1 part, water 30 parts, and then place in a flat position to dry. When thoroughly dry, strip off the gelatine, and the glass will be found to have an extremely fine matt surface.

**A Half-tone Process for Aluminium or Zinc Printing.**—Professor Aug. Albert suggests the following process in the *Photographische Correspondenz*. A rather finely grained collotype plate is rolled up with black ink with which is mixed some transfer ink, and as soon as a satisfactory result is obtained a pull is made, not on paper, but on a fine-grained aluminium or zinc plate, which takes the ink very well, especially if a little more pressure is put on the machine. By this transfer of the continuous tone image to the grained metal surface an image is obtained which can be used for ordinary printing, if the further treatment is the same as an ordinary transfer or chalk drawing of the lithographer, with the exception of the strengthening of the transfer by means of ink. Before etching, any of the ordinary litho processes, such as touching up with chalk, needle, &c., or another transfer of writing may be done, and the process may be used for colour printing, placards, &c.

**Röntgen Rays in Military Surgery.**—Major Battersby lectured on this subject before the last meeting of the Röntgen Society. He was selected for service in charge of the Röntgen ray apparatus in the Soudan, where the temperature varied from 100° to 122° F. in the shade; and his paper was based upon his experience in this campaign. After the battle of Omdurman 121 British wounded were conveyed to the surgical hospital at Abadieh. Of that number there were 21 cases in which the bullet could not be found or its absence proved by ordinary methods. In 20 out of these 21 cases an accurate diagnosis was arrived at with the help of the rays, the odd case, who was suffering from a severe bullet wound in the lung, being too ill for examination at the time. The senior medical officer in charge of the hospital said: "The Röntgen rays proved of invaluable assistance in localising the exact position of bullets, and in many cases rendered probing of wounds unnecessary. . . . In many cases the X rays prevented much suffering to the patient, which would have been caused by probing, the use of the finger, or enlarging the wound in the ordinary search for the bullets, as the skiagraph at once indicated the exact position of the bullet. In other more complicated cases the Mackenzie-Davidson method localised the exact position of the bullet, so that the surgeon was at once able to come to the conclusion if operative interference was judicious or otherwise. If considered advisable, the removal of the bullet was much facilitated by the diagram previously indicating exactly where the projectile was to be found."

**The Recent Eclipse of the Moon.**—According to an American contemporary, the total eclipse of the moon on December 27 was viewed with considerable success at the United States Naval Observatory at Washington. Owing to partial cloudiness, several of the occultations could not be observed. The moon was scheduled

to enter the shadow at 4.57 o'clock, and the totality to begin exactly one hour later. The actual time was a few seconds later. According to the arrangement made by the Observatory at Pulkowa, Russia, one hundred-and-three occultations were to be observed in different parts of the world, and twenty-one were assigned to the National Observatory at Washington. Seventeen of the twenty-one occultations were observed, and the rest were obscured by clouds. The scientific value of the eclipse will be chiefly verifying the knowledge which has already been obtained by other methods regarding the same diameter of the moon. Observations were also made at New Haven, Conn., at Columbia, by Professor Rees, and at Princeton, N. J., by Professor Young. The eclipse was viewed with great success in Berlin at the Treptow Observatory by Professor Archenhold, who photographed it in all its phases. At Berlin the moon entered into totality at a quarter to twelve o'clock, when the colours became brighter than previously. It was first a dark brown with a streak of yellow; next a reddish brown; and lastly a beautiful combination of colours, as though pierced by the rays of the sun. The silver-white line then kept spreading, and at twenty-five minutes past twelve it was at the maximum. In every phase the delineation of the moon was visible; that of the shadow of the earth was much less clear. It is stated that Mars became very red during the period, becoming more intense according to the colour assumed by the earth's shadows.

**Spectrum of a Radio-active Substance.**—In *Comptes Rendus* M. E. Demarcay states that M. and Mme. Curie asked him to examine, spectroscopically, a substance consisting chiefly of barium chloride, but supposed by them to contain also a new element. The material was dissolved in distilled water, slightly acidulated with hydrochloric acid. The spark spectrum of this solution was very brilliant. He photographed the spectrum, having prepared two plates, and giving one double the time of exposure of the other. These two plates gave practically identical results. He measured the lines, and was able to see: (1) barium, with great intensity of both the strong and weak lines; (2) lead, recognised by its principal lines, which were much more feeble than the others; (3) platinum, due to the electrodes and traces of calcium probably from the solvent; (4) a line, stronger than the weak lines of barium, with wave-length 3814.8 (Rowland's scale). This line does not appear to have been attributed to any known element, and is probably due to a new substance, for two reasons; firstly, that on the plate were no lines, other than these enumerated, except a few feeble air lines, thus excluding the presence of all elements having only weak lines in the neighbourhood of 3814; secondly, the methods employed for the purification of the substance prevent the possibility of the presence of iron, chromium, cobalt, or nickel, &c. Barium and lead, M. Demarcay is fully assured, give no line coinciding with this. This line has been measured by means of the two platinum lines, 3818.9 and 3801.5, which enclose it. It is near to, and distinct from, a bismuth line of moderate intensity. His conclusion is that the presence of the line 3814.8 confirms the existence of a small quantity of a new element in M. and Mme. Curie's barium chloride.

#### JOTTINGS.

THAT eminent man of science, Mr. J. W. Bennetto, who is undergoing so much local and metropolitan persecution because, having discovered the secret of colour photography, he refuses to divulge it to a world that would infallibly rob him of the profit and honour of his invention, may take comfort in his hour of trial. He is not the first great discoverer who has had to suffer for his success. Galileo was imprisoned for his astronomical theories, and only three years ago Röntgen was laughed at for days by ignorant newspaper writers for alleging that solid bodies were penetrable by luminous radiations. Yet time has vindicated both the great astronomer and the great physicist. Time, too, may be relied upon to vindicate Bennetto, the first man of science to solve the hitherto insoluble problem of colour photography. So let the Philosopher of Newquay have courage! He is assured of an immortal renown and a bust in Westminster Abbey.



It is true that, unlike Galileo and Röntgen, Bennetto prefers not to indicate the exact nature of his discovery; but such reticence, instead of exposing its gifted author to the ridicule of the profane, should, I submit, rather be accepted as a sign of the modesty and confidence which we naturally look for in a successful man of science. It is only such inferior and unscientific persons as Ives, Lippmann, and Joly, who publicly descend to details, and tell you precisely what they claim, and how they produce their results, not forgetting, of course, the illustrious and philanthropic M. Chassagne, who actually sent some of his pupils to England from Paris for the purpose of publicly demonstrating his memorable selective absorption process. But look at the penalty of such frankness! When the calm, uncommunicative, successful discoverer like Bennetto arises, with the philosopher's stone of colour photography safe in his pocket, he is enabled to regard with pity and contempt the abortive efforts of Philadelphia experimentalists and French and Irish professors. What do *they* know of colour photography, forsooth?

Yes, give me science at all costs, especially in colour photography. What can be more admirable in a man of science than a sturdy and dauntless indifference to the failures of those who have preceded him in a particular line of work? Mr. Bennetto finely exemplifies this characteristic trait of the thorough-going investigator in his process of colour photography, which was published last month. It is true that this process, shortly describable as trichromatic negative-taking plus bichromate-printing in coloured pigments, was invented, tried, and abandoned as comparatively useless years ago. But what of that? Does it not prove that, in going to the ancients as the source of his knowledge, Mr. Bennetto is animated by the yearning to escape from the influences of the sham or superficial science which is only too prevalent in these days? does it not prove boldness of theory, originality of practice, and a firm disregard of the opinion of those shallow and misguided individuals who only discern supreme merit in absolutely new ideas, and are inclined to view with disfavour the exhumation of dead and buried processes? Undoubtedly it does. So, Mr. Bennetto, sir, I salute you!

Stereoscopic photography appears to be exciting renewed attention just now, and there have been several letters and articles published in these pages relative to the most suitable size of plate to use. The double quarter, or half a whole-plate ( $6\frac{1}{2} \times 4\frac{1}{2}$ ), has many advocates, myself among them, but I wish those writers who choose the size because it allows of the use of two quarter-plates when  $6\frac{1}{2} \times 4\frac{1}{2}$  plates are not obtainable would try the idea before wasting ink upon it. More nuisance than its worth is an estimate that here applies with great force. Two quarter-plates set side by side in a dark slide are displaced on the smallest provocation, so that you are never sure of your exposures having been properly made, and in transparency-making from the negatives—if you have been fortunate enough to obtain them—the trap into which one is likely to fall, by having to handle two plates, is obvious. Working in the dark, and exposing in contact, you want all your wits about you to keep your lefts and rights right with *one* plate; but, when you come to two, you must redouble your care. By all means let us have the very elegant and symmetrical size,  $6\frac{1}{2} \times 4\frac{1}{2}$  (the true half-plate), but let us get rid of the stupid notion, repeated from year to year by imitative new comers, that “two quarter-plates” may conveniently be used instead of the single half-plate. The care so necessitated makes stereoscopic photography a burden instead of a pleasure.

It is late in the day to descant upon the charms of stereography. The individual who cannot appreciate a properly prepared binocular photograph is to be pitied. But it is not too late to repeat an old suggestion of mine, that professional photographers should try to popularise stereoscopic portraiture, studio and “at home,” especially the last, amongst their sitters. The old timers, no doubt, will smile at the suggestion; but I have faith that the younger men who are coming on in photography will at least have the wit to take all seriously tendered suggestions into consideration, a respect in which

the old timers are not notorious for having been successful. If in the photographer's reception-room there were placed a few stereoscopes with slides and transparencies of people amid suitable accessories, or among home surroundings, many a sitter might be induced to have him or herself binocularly portrayed. If the centres of the show stereographs are well under 3 inches, say  $2\frac{1}{2}$  inches, or even a shade less, the readiness with which the magic effect is obtained will materially help the photographer in his object. The difficulty people have of seeing stereoscopic photographs stereoscopically is, in the great majority of cases, due to the excessive separation of the centres. This I have found to be so in scores of instances that have come under my own personal observation.

Yorkshire, having brought off one of the most successful photographic exhibitions yet held, is setting about the formation of a Union of photographic societies having their homes in the county of many acres. There are about twenty of these societies, or nearly a tenth of the total number in Great Britain. But, besides societies, “photographers” are to be included in the Union. Does this mean isolated individuals, not members of any society? Practically the Yorkshire men wish to do for themselves what the Affiliation has hitherto done for them. Such a movement as this was inevitable sooner or later. I should not be surprised to see other powerful photographic centres like Glasgow, Edinburgh, Liverpool, and Manchester, and Birmingham follow suit. I take it that a desire for a kind of photographic Home Rule is at the bottom of the idea. Local spirit is bound to assert itself in the long run when hundreds of miles separate a constituency from the seat of government.

This brings me to the subject of the Royal Photographic Society's Council election and the letter of Mr. G. T. Harris published on January 6. That letter is an able and academical defence of things as they are, which might have been officially penned. Its obvious defect is its lack of sympathy with the aspirations of large numbers of professional photographers who look to the Royal Photographic Society to help them in their legitimate strivings after improvement. It cannot be denied that recent exhibitions at Pall Mall have prevented many able men from profiting by the opportunity of exhibiting their work—men of the stamp of those who aforesaid were the mainstay of the Exhibition. According to Mr. Harris such men have no more interest in the Society than the merest outsider or the *dilettante* person who can afford to pay twenty-one shillings a year! And it is their own fault that they do not go to the meetings, the highly abstruse discussions at which Mr. Harris thinks suitable pabulum for all tastes and requirements! Nobody, of course, expects the Royal Photographic Society to exist for professional photographers only, or to relinquish its work in the advancement of science. Nobody wants it to be a benefit society or a trade centre; but, on the other hand, all but a few persons cannot fail to see that the Society by no means takes the fullest advantage of its scope and opportunities, and has vast and unexplored fields of work before it.

Mr. Harris asks what the typical professional photographer expects of the Society. The President (Lord Crawford) answered the question, by anticipation, last autumn, when he told the Society that it was neglecting the “bread-and-butter” side of photography at the exhibitions. The fact is that, as the leading photographic society in Great Britain, a variety of interests are committed to the care of the R.P.S., and in recent years not all of those interests have been studied. How many people realise that in Great Britain there are between 4000 and 5000 professional photographers? How many of these are members of the R.P.S.? I have dreamed that one day the elevation of the status of professional photography will be an accomplished fact; that the R.P.S. will occupy a relationship towards professional men such as the Colleges of Physicians and Surgeons, the Institution of Civil Engineers, and the Institute of Architects hold towards members of the respective professions they represent. Am I to suppose that Mr. Harris and his friends do not wish such a consummation? It is not impossible of achievement and I for one hope to see it accomplished.



Remembering that the R.P.S. is one of the few "Royal" Societies and has a charter, is it not remarkable that anybody with a guinea in his pocket can become a member? Surely such a state of things will not be allowed to continue long. Members recruited from a source of this nature can hardly be regarded as capable of contributing real strength to a society. The "bread-and-butter" man holds aloof in his thousands because no special effort is made to attract him, as is done in the case of the Pharmaceutical and many other representative societies. I am convinced that, without abdicating in the least its mission to advance the interests of photographic science, or stepping outside the lines of its charter, the R.P.S. has it in its power to become a mighty representative body, entitled to speak and act on behalf of thousands of men who have a stake in photography. But such letters as that of Mr. Harris, and the narrow-minded view of what the Society should be which several other persons take, will not assist the forward movement.

Of course, Mr. Harris and others have a perfect right to urge that the Society shall keep to the lines upon which it was originally started—that of a scientific debating society—nothing more; but to insist upon the point is equivalent to an admission that much which has been done by the Society in recent years was needless and wasteful. Surely rooms in Great Russell-street and Hanover-square, an efficient secretarial staff, the Charter, the Fellowship scheme, the Crystal Palace Exhibition, and the house in Russell-square—surely this highly elaborated machinery were superfluous in the case of a society whose sole *raison-d'être* is, to quote Mr. Harris, "discussions." I prefer to take the broader view and to look upon these things as so many marks of progress along the path that leads to the consummation of an "Imperial" policy, to quote my friends of the *Photogram*, and that will be when no photographer worthy the name is outside the R.P.S., and when it will be to the direct interest of every "bread-and-butter" man to seek membership and be proud of it.

COSMOS.

#### FOREIGN NEWS AND NOTES.

**Cyanine as a Sensitizer.**—Baron von Hübl draws attention, in the *Atelier des Photographen*, to various properties of cyanine which may account for the difficulties frequently experienced in using this dye. A peculiarity which has received little notice is the insolubility of cyanine in water and dilute alcohol. An alcoholic solution of cyanine diluted with much water has a violet-blue colour. A superficial observer might take this to be a solution of the dye, but it is in such a condition that, if passed through stout filter paper, the liquid becomes colourless, and the dye remains upon the filter. Such a bath would not dye the inner part of the film of a dry plate, and the cyanine retained upon the surface of the film would probably cause fog and spots. The sensitising bath should consequently contain abundance of alcohol. The colourless acid combinations of cyanine readily dissolve in water, and this accounts for the powerful action of the sensitising bath made up with acetic acid as recommended by Weissenberger, who discharges the colour of the bath by adding a few drops of acetic acid, thus producing an acid combination soluble in water. This bath penetrates the film, and the blue dye is thus deposited below the surface when the plate is dried, the combination of acetic acid and cyanine being only possible in solution. Another peculiarity of cyanine is its instability when dissolved in alcohol. Dr. Eder has recommended the treatment of commercial cyanine with concentrated hydrochloric acid and subsequent evaporation to dryness. The dye will then give plucky negatives free from fog. It is a common opinion that the iodide is thus converted to chloride, and that a more suitable preparation is obtained, but, if commercial cyanin is rubbed down with moist chloride of silver and treated with alcohol, the bath will still give foggy negatives devoid of vigour.

The improvement due to treatment with hydrochloric acid must, therefore, have some other cause, which is probably the removal of foreign substances by the acid from the commercial article, or conversion of a portion of the cyanine into colourless soluble substances. The fact that a resinous precipitate is left after treatment of cyanine with concentrated hydrochloric acid supports this view. Unfortunately, cyanine thus treated deteriorates rapidly. In a week a loss of sensitising power is frequently observable, and, as the solution gets older, the plates lose sensitiveness in increasing

degree. The deterioration of the solution proceeds much more rapidly in daylight, and exposure to sunlight for half an hour reduces the sensitising power to about one-fourth. The following rules may be deduced from these facts:—

1. The solution must contain a considerable quantity of alcohol, say about thirty per cent.

2. A minimum of the dye should be used. 2 c. c. of cyanine solution of the strength of 1 in 500 are sufficient for a bath of 200 to 400 c. c.

3. The solution of the dye should be freshly prepared and protected from light.

As cyanine loses its colour in the presence of weak acids, an alkali should be added to the bath. Usually a few drops of ammonia are added; but a solution of borax is preferable, as it renders the plates permanently alkaline, and prevents any change in their condition, even after they are dried. If fine definition is unimportant, the plates may be exposed wet. In the dry state, however, the plates are less sensitive, and have a tendency to fog. If it is necessary to dry the plates, dextrine should be added to the bath. Baron von Hübl recommends the following baths:—

#### SOLUTION A.

Ten per cent. solution of dextrine in water .. 400 c. c.  
Alcohol ..... 150 "  
Cold saturated solution of borax ..... 20 "

For orange sensitive plates, as used in three-colour work for the blue picture, take 300 c. c. of Solution A,

2 c. c. of cyanine solution (1 in 500).

If the plates should also be sensitive to green, add to this bath 2 c. c. of chinolin red solution, 1 in 500, or ammoniacal solution of eosine silver, preferable 3 c. c. of Dr. Albert's P dye. To secure sensitiveness to blue green also, 4 c. c. of acridine yellow (1 in 150) should likewise be added. Plates thus prepared may be used for three-colour work and with Joly's screens. The plates are left in the bath from five to ten minutes, and dried in absolute darkness, without previous washing. If the plates are exposed wet, water may be substituted for the dextrine solution.

**Another Giant Telescope.**—The *Photographische Mittheilungen* states that the new telescope for the Potsdam Observatory will be ready by July 1 next. The dome of the observatory is finished, and the stand for the telescope is now being constructed. The tube of the telescope is 32 feet long, and there are to be two objectives, 50 c. and 1 m. in diameter. The latter is for stellar photography. Both lenses are being made by Messrs. C. A. Steinheil Söhne, of Munich, and their joint weight is about 13 cwt.

**The Pyro-acetone Developer.**—The same journal mentions that this developer is particularly suitable for plates with a tendency to frill. Although it has been stated that acetone in use is not superior to carbonate of soda, yet it must be remembered that the former is of great value for the development of plates that show the imperfection we have mentioned. A batch of plates, which frilled very badly with the pyro-soda developer, was quite under control with pyro acetone.

**A New Lens.**—A few months ago we mentioned that the firm of Carl Zeiss had constructed a new lens, by means of which an object could be photographed in exaggerated length or breadth. The lens may become important for the alteration of designs in the manufacture of carpets, &c. The *Deutsche Photographen Zeitung* has just published as a supplement two pictures showing how the lens may be used by the photographer for taking caricature portraits. Two men are engaged in earnest conversation. One has a white hat, black coat, white trousers, and striped waistcoat, and the other a black hat, white coat, striped trousers, and an umbrella. In one picture the men are tall and thin, and in the other short and fat. The effect is very ludicrous, and, as the identity of the individuals is strictly preserved by the lens, the photographs are far in advance of any we have seen produced by means of artificial backgrounds.

**Sunday Observance.**—The recent laws enacted in Germany for the observance of Sunday rest seem to have produced some friction, and many photographers consider them a grievance. A merchant recently applied to a customer on a Sunday for settlement of an account. A complaint was lodged against him for non-observance of the police regulations, and he was condemned. He has,



however, successfully appealed against the decision, which has been quashed upon the ground, that working in public consists of such acts only as would appear to be work in its general acceptance.

**Ebonite Shutters.**—Dr. Paul Michaelis mentions in the *Rundschau* that he noticed, during a Norwegian trip, discharges of electric light in drawing the ebonite shutters of his dark slides. The ebonite was in contact with aluminium, and by increasing the friction the electrical discharges were intensified; fortunately the plates were not affected. The experiment was again tried several times at a later date, but without success. Probably the atmosphere was very dry when the discharges were seen, as similar phenomena have been observed when ebonite combs are used in frosty weather, the atmosphere being very dry. Those who use vulcanite shutters with their dark slides should, however, note the fact.

#### EXPOSURE OF THE BACK OF THE PLATE.

HERR R. E. LIESEGANG points out, in the current number of the *Photographische Correspondenz*, that all the advantages of multiple-coated plates may be obtained by exposing an ordinary plate through the back, his arguments in support of the statement being that the light incident on the opaque bromide of silver is very much weakened in its passage through the film, so that the side turned away from the glass will be considerably less exposed than the others. A plate thus exposed will behave in exactly the reverse manner to one exposed in the ordinary way; the developer acts, in the case of the plate exposed, from the back, first on the under-exposed layer of bromide particles, and the further it penetrates the more it comes into contact with the better-exposed particles. It is possible therefore to stop development when the desired density is obtained.

The advantage of exposing through the back is obvious when one considers the mechanics of the ordinary process, in which the developer acts most strongly on that portion of the film which has received the greatest exposure; with under-exposed plates this is not of much moment, but with over-exposure the plates exposed through the back have considerably the advantage. The effect of exposure through the back is stronger the thicker the coating of the plate. The amount of silver in the plate is used up better in this way, as in the ordinary method fogging of the plate frequently makes it impossible to develop far enough.

Orthochromatic plates show the good effect of this method of working, and the optical effect of the sensitiser is increased. Exposure through the back will be of special moment for half-tone work, as here the avoidance of fog is important. Process plates too are, as a rule, coated thicker than ordinary.

For ordinary camera work the reversion of right and left will always be a disadvantage, which, however, will not be felt in the case of films which are generally coated more thinly than plates.

#### FURTHER EXPERIENCES WITH LIPPMANN'S PROCESS.

DR. R. NEUBAUSS gives in the current number of the *Photographische Rundschau* some further notes on his experiments with Lippmann's process, which are not without practical interest.

He confirms his previous statement that Lautenschläger's gelatine is the only one that will give satisfactory results. The weather has considerable influence on the emulsion, and on hot, dry days, with an east wind, a successful emulsion cannot be prepared, and it is far better to make the same only on cool, rainy days.

The temperature of the emulsion at the time of mixing should not be higher than 31° C. in summer, nor more than 35° C. in winter, and the plates must be coated as quickly as possible, as the emulsion must not be heated up again. Although emulsions thus prepared are much slower, yet the colours are in every case more brilliant. It has been found advisable to heat the glass before coating to about the same temperature as the emulsion.

In many cases bleaching the results with mercury and blackening with amidol gives splendid colours; and, with compound colours, the best results were obtained by first intensifying with mercury and amidol, and then reducing with Farmer's reducer. It is better, however, if possible, to obtain results by development alone. The reducer must be used in extremely weak solutions, and ammonium persulphate cannot be used.

For albumen plates cleared albumen should always be used, and it is

better to use albumen solution that is at least from five to six months old. The albumen solution will keep for at least twelve months. Whilst the freshly coated albumen plates have a great tendency to frill in the alkaline developer, this fault is entirely avoided by using plates which have been coated for several months.

Professor Lippmann has pointed out that albumen plates may be developed with a plain, hot solution of pyrogallol, and this is of importance, as it is the alkali which tends to frilling.

Albumen plates which had been sensitised and dyed were found to give excellent results after ten months' keeping, so that it would be possible to place such plates on the market.

Dried albumen cannot be used, nor can the vegetable albumen introduced by Jolles & Lillienfeld.

#### ABOLISHING THE DARK ROOM,

[Paper read before the London and Provincial Photographic Association, January 12, 1899.]

THE modern dark room may be correctly described as follows:—A room in which the illuminant is seldom more than a single paraffin burner, the light from which, in four cases out of five, is reduced by being enclosed in a lantern, three of whose sides are opaque and from the remaining side the light endeavours to avoid complete extinction in escaping through deeply coloured media. The depths of darkness which are finally reached when the light (or what is left of it) has emerged from the glasses or fabrics employed for the dark-room lantern is best shown in the form of photometric measurements:—

Material.	Approximate loss of luminosity in the direct rays of the lamp.
Double-flashed orange (two thicknesses) ...	97.5 per cent.
Ruby (one thickness) and double-flashed orange (one thickness) .....	98.0 "
Deep ruby (one thickness) .....	99.0 "
Red (cherry) fabric (one thickness) .....	98.6 "

Therefore only two per cent. of the light, in the case of moderately safe media, is available for working.

In a communication to the Royal Photographic Society in May last, entitled, "A New Function of Developers," I gave an account of experiments undertaken with a view to ascertain how far this absence of light in the developing room can be avoided. In this communication the functions of the dark room were divided into two sections as follows:—

1. The protection of the film from actinic light during development.
2. The protection of the film during transfer to or from the developer, dark slide, &c.

In the subject-matter following, it was shown that the function under the first heading can be equally well fulfilled by the addition of certain colouring matters to the developer, and with this result, that, from the time the sensitive film is immersed in the coloured solution, the process of development and subsequent operations can be carried on in the ordinary white light.

The present paper gives the practical results of a continuation of the experiments, more especially as regards the functions of the dark room, which fall under the second heading.

Attempts were made to determine whether the illumination can be increased without sacrificing safety by making comparative trials with every likely colouring material, more especially with soluble aniline dyes, coloured salts, extracts, &c.

The rays from a small electric arc lamp were projected through dilute solutions of the colouring matters, and then through a spectroscope, and the portion of the spectrum where the maximum absorption occurred ascertained in each case.

Colouring matters or combinations of the same which gave complete absorption of all rays except red, orange, and yellow, were tested by exposing plates to the spectrum of the light which had passed through them, and by successive strengthenings of the solution, or one of them, according to which portion of the spectrum prolonged exposure gave a deposit, filters were obtained giving the maximum safety and transparency. The results obtained were remarkable.

Experiment I.—The light from a lantern, the illuminant in which is a sixteen-candle power incandescent film, was passed through a filter prepared in the manner described, the illumination being thereby reduced approximately fifty per cent., the candle power of the light emerging from the lantern being at least equal to that from eight naked candles, that is to say, the intensity of the light was fifty times greater than that from an ordinary lantern, and yet in this brilliant light instantaneous plates were as safe as in the latter case, an exposure of six minutes in the case of a Castle plate, at a distance of thirty inches from the lantern, having no appreciable effect on the film.

Experiment II.—The rays from an oil enlarging lantern were allowed at their point of crossing to pass through a similarly prepared filter. At a distance of twelve inches, where the diverging rays form a brilliant patch of light four inches in diameter, sensitive plates were developed with com-



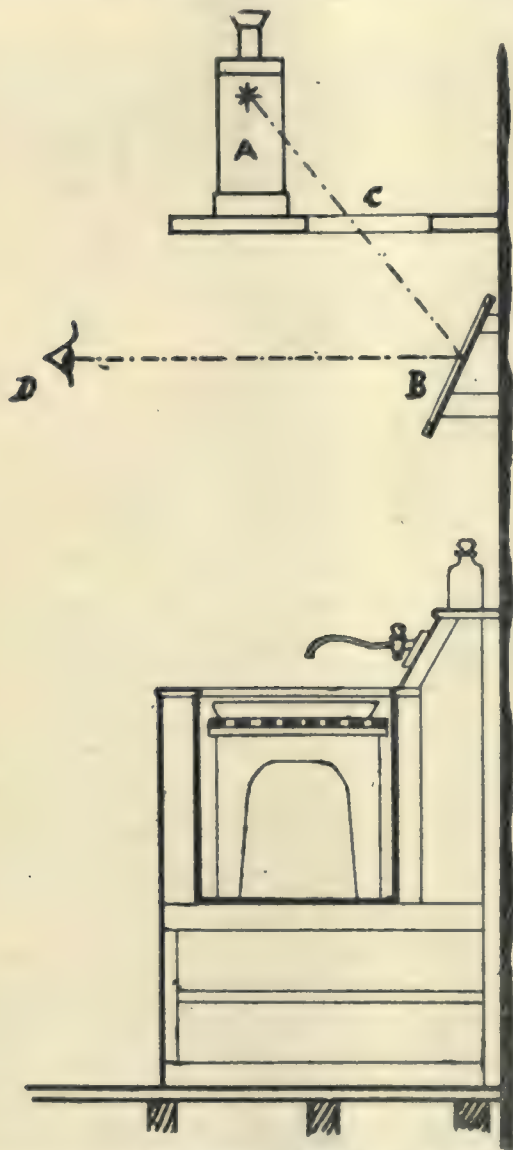
plete immunity from fog—a half-covered Castle plate immersed in a colourless and energetic (rodinal) developer remaining twelve minutes without perceptible darkening.

These and many similar results give the following approximate figures:

	Approximate candle power of illumination for safety at two feet from lamp.	Relative illumination for equal safety.
Double flashed orange glass .....	·08	1
Liquid filter .....	6·0	80

These figures are better realised when we remember that the luminosity of a bright sky is only thirty times greater than a surface of black matt paper.

The explanation of this difference between the supposed necessarily limited illumination of the film and the unsuspected comparative



Section of Developing Room with Illumination Equal to Naked Gas Flame (10 candles).  
A, light; C, filter; B, mirror; D, eye.

brilliance of illumination which experiment shows can with safety be employed is very simple, and is due to two causes.

I. The low absorption equivalents (*i.e.*, transparency) of the colour filters in use for many of the rays to which films are highly sensitive.

II. To their high absorption equivalents (*i.e.*, opacity) for many of the rays to which films are least sensitive.

The custom has become general of working immediately in front or at one side of the light; in other words, "work is carried on in the position of maximum illumination." The advantage and even necessity of this

mode of working is obviously due to the low luminosity of the light emitted from the lanterns; but, when by the use of colour filters which have been adjusted to give the maximum safety and transparency the illumination is increased from ten to a hundred fold, an entirely new system of lighting becomes feasible—a system in which the bench and sink become the position of minimum illumination—in which the general lighting (although the more actinic rays are completely absent) is made equal to that from naked oil, gas, or electric lamps, and we have a room which in no sense of the word can be termed *dark*, and in which the handling of sensitive plates and the operations of development can be carried on under conditions vastly more efficient and comfortable.

It is obvious that, notwithstanding the blue and violet rays are entirely eliminated, an illumination of ten or twelve candle power in red and yellow rays would be fatal to orthochromatic plates; and where such are employed I complete the system by enclosing with wood or curtains a small space on the bench to form a shelter in which the plates are transferred to dark slide and developer, and, when once in the latter, all need of protection ceases, by utilising the very practical method described in my paper to the Royal Photographic Society previously mentioned.

My remarks hitherto have referred to what may be termed permanent developing rooms. To those who only require conveniences for occasional development, and have no room from which white light can be excluded, I recommend the use of a shelter such as has been referred to in conjunction with my safety developers.

In case there may be any here or among those who are groping in darkness in more distant places who doubt the practical nature of the remedies offered, or who still think that a developing room is necessarily also a dark room, I shall be very glad to show our system at the Polytechnic.

E. HOWARD FARMER.

#### AN ILLUSION AND ITS CAUSE.

On the top of a hill that forms my western horizon line stands a number of buildings. One evening recently I watched the sun setting beyond the buildings, and saw something which, says Mr. R. M. McCreary in *Popular Astronomy*, if I had not often witnessed similar appearances, I would have regarded it as a wonderful phenomenon. The sun looked larger than the buildings; it passed directly behind one which I know is fifty feet long, and I saw the whole building projected on its disc, and there was disc room for more, so that the sun on that occasion appeared to be more than fifty feet in diameter.

Why was this? What caused the illusion? For it was an illusion, as a little experiment described in Sec. 88 of Young's *General Astronomy* will demonstrate. Or, to make the question general, why does the sun, and the moon, too, appear larger when near the horizon than when at a high altitude? The question is suggested whenever one sees the sun or the moon rise or set; it has often been asked, but there is recent and, I suppose, good authority for saying that it has never been satisfactorily answered. Where many have failed it may be presumption for me to attempt, but I will attempt. If I succeed, a long-felt want will be supplied; if I fail, I shall get myself into good company—into the company of some who have been eminent for astronomical attainments, but who have tried and failed to account for the illusion.

I will begin by supposing a case. Suppose a lady goes shopping and buys a piece of goods; she returns home and measures her purchase with what was once a yard stick, but from which, unknown to her, a piece has been cut. She will think that she has more goods than she purchased. Suppose, further, that the lady cannot see or cannot be convinced that her supposed yard stick is not a yard long. In that case she will go down to her grave firm in the opinion that she had got the big end of at least one bargain. Now, something analogous to this happens whenever we see the sun or moon apparently enlarged. When we see those bodies high in the sky, we apply to them angular measurement, and thus see them as of their true angular diameters. We are then in the same state of mind as was the lady when she left the store with her purchase. But, when we see the sun or moon near the horizon, we apply to them linear measurement, the dimensions in feet, yards, or other units, which we know or can always very closely estimate, of houses, trees, fences, or other terrestrial objects near which they appear; but we do not take account of the shrinkage which, owing to distance, our measuring instruments have undergone. In consequence, the sun or moon, in the position supposed, appears to be enlarged just in the ratio that the distance-reduced size bears to the real size of our comparison objects. We are deceived just as the woman was deceived when she measured her stuff with a yard stick that was not a yard stick. And we will continue to be deceived. As the woman in the little fable I have constructed pins her faith to her supposed yard stick, and lives and will die under an hallucination, so we, as long as the sun and moon shall rise and set for us, will apply to their measurement our distance-diminished terrestrial standards, and, in consequence, we will continue to see those bodies apparently enlarged, according to the distance that intervenes between us and our standards of measurement.

It cannot, in the nature of things, be otherwise. We carry in our minds definite ideas of linear extension, of the length of a foot, a yard, a rod, and, within reasonable limits, of their multiples, and, when we know or estimate that a terrestrial object corresponds in extent with



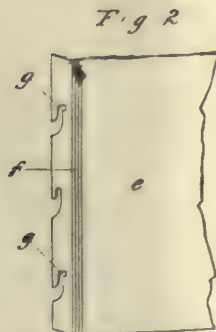
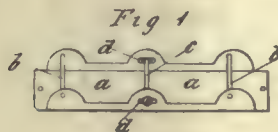
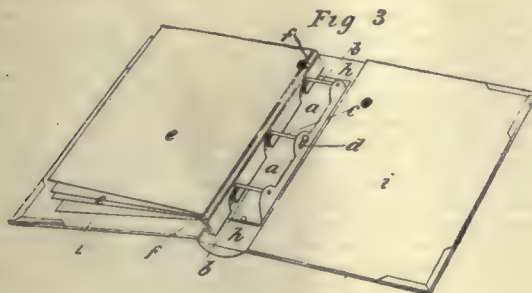
any number of these units, we see it, and we cannot help seeing it, whether it is nearer or more remote, as of that size. We see it in its true or estimated linear dimensions, notwithstanding, or in spite of, the fact that we know that its angular size is reduced by distance. A man six feet high seen at a distance of a quarter of a mile really measures about an inch, but we see him as a man; a panel of a fence a mile away measures about three-quarters of an inch, but we see it as a rod; and the house, behind which I saw the sun setting, seen from my window, actually measures but little more than half an inch, but I see it as a fifty-foot building. I saw it so on the occasion noted; I used it for measuring the sun, and, as my standard of measurement appeared magnified nearly a hundred-fold, the sun seemed enlarged in exactly the same ratio.

I did not set out to explain why we see terrestrial objects in their true proportions regardless of distance. It is the result, I suppose, of experience. But the explanation is not necessary; the fact that we see objects so and employ them as thus seen, instead of as they ought to appear, for measuring the discs of the sun and moon is, I believe, the cause of the illusion which it was my purpose to explain.

The illusion for which the foregoing is an attempt to account must not be confounded with a similar illusion arising from a different cause, that is, the moderate, gradual change in the apparent sizes of the lunar and solar discs which they undergo as they recede from the eastern or approach the western horizon. The latter illusion is owing, as was long ago explained by Alhazen, to the apparent ellipticity of the sky, in consequence of which we see the sun and moon projected on a background that is nearer or more distant, according as those bodies are viewed at a higher or lower altitude. We view, not the sun or the moon directly, but its projection on the sky, and the illusion appears; if we view them directly, through smoked or coloured glass, the background cannot be seen and the illusion vanishes.

#### ALBUMS: MR. R. DALTON'S SYSTEM OF HOLDING SEPARATE PAGES OF LEAVES.

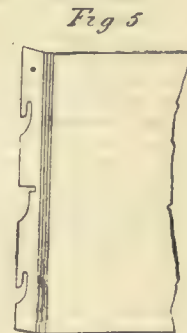
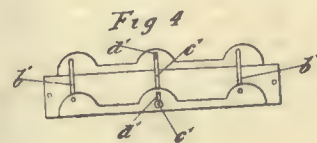
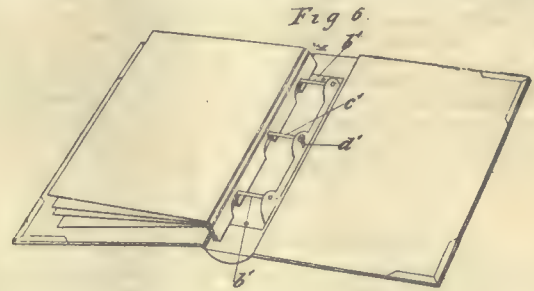
SEPARATE pages or leaves are held in a specially devised holding appliance in which they are, by being specially slotted, adapted to fit. The appliance, which is mainly designed to hold the pages or sheets of



postage-stamp collections, or sheets of photographs, or other like sheets or pages, is so devised that any page or pages held by it can be withdrawn from among others at will, without causing displacement of such others, and without necessitating special holding of such others otherwise than by the appliance.

The appliance consists of an open-ended shoe of brass, gun metal, or

other suitable metal or material, the sides of which project from the back or sole at approximately a right angle. Extending across from one side to the other bars are situated at suitable distances apart. One of these bars is free to be moved within the limits of slots provided in the sides of the shoe. This bar is, for convenience in description, termed the locking bar. On the fixed bars are loosely suspended the separate pages,



leaves, or sheets, which, for that purpose, are provided with slots having shoulders, which prevent movement in the direction of the length of the shoe. The pages, leaves, or sheets, are also slotted to accommodate the locking bar, but the slots therefor are not shouldered.

The pages can be withdrawn only when the locking bar is in the unlocked position, as, when the locking bar is in the locked position, it lies in the slot provided for it in the pages, and prevents withdrawal.

When, however, the locking bar is moved to the unlocked position, by drawing it out of the slots in the pages, the latter can be drawn outwards, so that the shoulders aforesaid are clear of the fixed bars. The pages can then be moved in the direction necessary to free them from the bars. As aforesaid, any page or pages can be removed from the holder without displacement of the remaining pages, which, although unlocked, remain suspended.

Under a modification, the slots made in the pages for the fixed bars are not shouldered, and the locking bar works into and out of a shouldered slot with a direction of movement of a right angle to that in which it works in the arrangement above described.

Fig. 1 is a view of one form of the appliance for holding separate pages, leaves, or sheets.

The appliance consists of a shoe, *a*, of brass, gun-metal, or other suitable metal or material, the sides of which project outwards from the back or sole at approximately a right angle. Extended across the shoe are fixed bars, *b*, and a movable bar, *c*. The bar, *c*, is capable of being moved within the slots, *d*, provided in each side of the shoe, *a*. For convenience in description, the bar, *c*, is termed herein the locking bar.

At fig. 2 is shown part of a page, leaf, or sheet, *e*, adapted to fit into the holder. Behind the hinge, *f*, which is a flexible band strengthened by linen or other suitable fabric, the page is slotted. The upper and lower slots are shaped so as to form shoulders, *g*. The middle slot, cut in the pages to take the locking bar, *c*, of the holder, is not so shouldered. At fig. 3 is shown a set of pages arranged bookwise in the holder, which is fixed to a backing, *h*, of wood or other suitable substance, to which are attached covers, *i*. In placing the pages in the holder, the locking bar, *c*, is first drawn down towards the bottom of the slot, *d*, and the pages, *e*, are then loosely hung on the bars, *b*. The locking bar, *c*, is then moved up in the slot, *d*, which it fits, and thus the pages, *e*, are locked on the holder. When the locking bar, *c*, is drawn down, any page or pages can be removed and replaced without necessitating removal of any



others, and without necessitating holding such others, otherwise than by the appliance.

At figs. 4, 5, and 6 of the drawings is illustrated a modification, according to which the locking bar, *c*<sup>1</sup>, works in a direction at right angles to that in which it works in the form of appliance shown at figs. 1, 2, and 3. The slots made in the pages for the fixed bars, *b*<sup>1</sup>, are not shouldered as in figs. 1, 2, and 3. The slot cut in the pages to take the locking bar, *c*<sup>1</sup>, is shaped as shown. As aforesaid, the bar, *c*<sup>1</sup>, works up and down in the slots, *d*<sup>1</sup>, in the holder towards and away from the face of the book. When the bar, *c*<sup>1</sup>, is drawn up in the slot, *d*<sup>1</sup>, as seen at fig. 6, the pages are locked in place. When it is required to move a page or pages, the locking bar, *c*<sup>1</sup>, is first pressed down to a sufficient degree, and removal of the page or pages is effected by drawing the said page or pages towards the top of the book until the slots in the page or pages are clear of the bars in the holder.

#### McKELLEN LIMITED.

THE business of Messrs. S. D. McKellen & Co., photographic-apparatus manufacturers, of Manchester, has been converted into a limited liability company, with a capital of 6000*l.*, divided into 6000 shares of 1*l.* each, of which 4000 are Ordinary shares and 2000 Deferred shares. The Deferred shares do not rank for dividend until a cumulative preference dividend of six per cent. per annum has been paid upon the Ordinary shares, and after a similar dividend has been paid upon the Deferred shares all the shares rank equally in the distribution of further dividends. The whole of the Deferred shares and 1000 of the Ordinary shares are taken as fully paid by the vendors in part payment of the purchase money, and the balance of 3000 Ordinary shares are now offered for subscription, payable 5*s.* per share on application, 5*s.* on allotment, and the balance when called for.

The directors are: Alderman R. Lovett Reade, Sale New Hall, Sale, Cheshire (Chairman); and Messrs. Walter G. Bagnall, J.P., Aspinshaw Hall, Derbyshire; William Barratt, Crumpsall, Manchester (Manager of the Manchester and Salford Microscope Company, Limited); Joseph Clare, J.P., Greenfield, near Oldham; Samuel Cowan, Ellesmere Park, Eccles, near Manchester (Cowan & Sons, opticians, Manchester); Abraham Rhodes, Birstall, near Leeds (Oakwell Soap Company); Samuel D. McKellen, Crumpsall, Manchester (Managing Director).

Messrs. McKellen & Co.'s latest inventions are: (1) the "Cathedral" Hand and Stand Camera; (2) the Triple Action Roller-blind Shutter; (3) the Aluminium Safety Shutter; (4) a Cycle Carrier for the safe carrying of fragile articles.

Mr. S. D. McKellen's services have been secured to the Company for a term of five years.

It is estimated that, upon a very moderate turnover, profits can be earned with the capital of the Company sufficient to show a dividend of considerably over twenty-five per cent. per annum.

The offices of the Company are at 4, Bull's Head-yard, Manchester.

#### PHOTOGRAPHING A FUNERAL.

At the Scarborough Quarter Sessions, before the Recorder, Mr. Charles Haigh, and a jury, an interesting case came on for hearing, in which Edwin Stead, photographer of Aberdeen-walk, Scarborough, sued John Waters, of the Equestrian Hotel, St. Thomas-street, Scarborough, for payment of 10*l.*, being the amount due on a dishonoured cheque. The circumstances of the case were somewhat peculiar. The defendant is an hotel-keeper, and also an amateur photographer, and his hotel, which is in St. Thomas-street, faces into Elder-street, from which street the funeral took place of Mrs. Brooks, the wife of a hairdresser, and her six children, who were burned to death in the Queen-street fire in June last. Defendant conceived the idea of photographing the funeral procession from the window of his hotel, and, although there was a dispute as to who actually took the photograph, it was admitted that both plaintiff and defendant were at the operation. The defendant then asked plaintiff to develop the plates, and get proofs to show to his customers, on the following day.

Thinking that he might make a profit on the transaction, he consulted plaintiff, and eventually 5000 copies in collotype, were secured. These copies were offered for sale. The plaintiff contended that by securing these for the defendant at the trade price he saved the defendant 7*l.* 10*s.*, and, in view of that and his other trouble, he claimed 10*l.* This, the defendant pleaded was excessive, but, on October 8, he gave a cheque for that amount to plaintiff, who, on going to cash it next day, was told that payment had been stopped by the defendant. The story of how the cheque was granted, as told by the plaintiff, was that the defendant went to his house late on a Sunday night, and said he had come to pay his account. Plaintiff had hitherto considered that the affair had been carried through as a sort of partnership, and told defendant that he thought he was entitled to half the profit realised on the photographs. The defendant said he could not agree to that, and that he intended to pay plaintiff merely his charges for his trouble. Plaintiff then said his charge would be 10*l.* Defendant demurred, and said he did not think it would be so

much, but he eventually took plaintiff back to his hotel with him, and made out a cheque for 10*l.* He remained there an hour, at the end of which time defendant asked him to let him look at the cheque again to see if it was all right. He did so, but, as he thought defendant was looking at it a long time, he got a little annoyed, and saying, "Is it not all right?" got hold of it, and in doing so tore it. On the following day he took it to the bank and found that defendant had stopped it.

The defendant stated that, while plaintiff asked 10*l.*, he told him that he was prepared to pay his account when he received a detailed statement, but the plaintiff asked him to give him a cheque for 10*l.*, merely to show his wife, and that he would give him a detailed statement of account, and that they would settle upon the morning. He agreed to do so, on condition that plaintiff agreed to tear the cheque across in his presence, and that the plaintiff did. In the morning, as plaintiff did not appear with the detailed statement as promised, he went to the bank, and stopped payment of the cheque. He paid 8*l.* into court and contended that this was sufficient for any service rendered by the plaintiff. The defendant said he took the photographs himself, but the plaintiff declared that the defendant had focussed the machine too high, and would only have obtained views of the County Court buildings and the bright blue sky. The jury eventually returned a verdict for the plaintiff for the full amount claimed, and judgment was given accordingly with costs.

## Our Editorial Table.

#### THE IMPERIAL SPECIAL SLOW BROMIDE PAPER FOR GASLIGHT DEVELOPMENT.

Manufactured by the Imperial Dry Plate Company, Orickwood, N.W.

IN sending us for trial samples of their newly introduced special slow bromide paper for gaslight development, the Imperial Dry Plate Company remark that in their researches, which have extended back for a considerable time, they have kept in mind what they consider to be the useful and practicable features. They rightly point out that a paper, to be sufficiently slow to be conveniently manipulated in ordinary gaslight, must be correspondingly slow in exposure. They have endeavoured to produce a paper of just the right sensitiveness, requiring an exposure not so long as to be inconvenient, the average exposure being twenty seconds, and yet not so sensitive as to become veiled from light exposure when working at a convenient distance from an ordinary gas flame. They have kept in mind also the necessity for pure blacks, for perfectly clear high lights, and for the range of tone to be all that could be desired for the most delicate portraiture. They manufacture the paper in two grades, rough and smooth; they have also resumed the manufacture of the ordinary rapid bromide paper suitable for enlargements.

The principal directions for use are as follows: The packets may be opened in ordinary gaslight a few feet from the flame. The exposure required for contact printing from a negative of average density is about twenty seconds at a distance of three inches from an ordinary gas burner. Avoid over-exposure, which will affect the purity of the whites and tend to give greenish blacks. For enlarging, the correct exposure should be determined by making a trial exposure on a small piece of paper. Any of the usual developers for bromide paper may be used. Use a perfectly clean developing dish, and flood the paper with water for a few seconds, then drain off. Pour the developer on so as to carry it in an even wave over the entire surface of the paper. Beware of air bells, which adhere to the film and cause white circular spots. During development the worker should remain at a distance of a few feet from the source of illumination, and, during the earlier stages of development at least, stand between the light and the developing dish. When development is nearing completion he should turn towards the light, in order more easily to judge when development is complete. If it is inconvenient to get to a distance of a few feet from the light, the flame should be somewhat lowered. For normal exposure the development should be complete in one minute, when the print should be rinsed in water and transferred to the fixing bath.

Following the instructions here given and using a metol-hydroquinone developer, we produced results of the most excellent qualitative character. The paper strikes us as easily capable of yielding a rich black, well-graduated image, with clear whites such as cannot fail to please the most critical taste. We welcome the introduction of this paper. Only last week, as our readers are aware, we were urging manufacturers to take up the preparation of slow-emulsion papers for development in actinic light, and we are glad to note that the Imperial Company amongst native houses are early in the field. The paper is quicker than others we have tried, a feature which, *pari passu*, is distinctly in its favour.

#### AMATEURS' PHOTOGRAPHIC REQUISITES.

The London Stereoscopic Company, 106 and 108, Regent-street, W., and 54, Chancery-lane, E.C. 176 pp., price 8*d.*

IN this elegantly produced catalogue the London Stereoscopic Company gives illustrated particulars of a large variety of photographic apparatus specially chosen with a view to meeting the requirements of amateurs. The many departments of photographic production which the Company



undertake are also set forth, so that it would not be easy to name a respect in which the London Stereoscopic Company can fail to be of service to its numerous clientele. A feature of the book is that it was actually printed at the Company's own works at Southgate. Viewed as an example of typographical production, it extorts very high praise.

#### CAMERA NOTES: THE OFFICIAL ORGAN OF THE NEW YORK CAMERA CLUB.

Published by the N.Y. Camera Club, 37 West Twenty-ninth-street, New York.

We have before now had occasion to refer to *Camera Notes* as a production in which the possession of a highly cultivated artistic taste is manifested by those upon whom the superintendence of its publication devolves. The receipt of the January number gives us the opportunity of noting that the high standard of excellence initially set up has been steadily kept in view. *Camera Notes* may without hesitation be termed the best publication of its kind—no other Society in the world sends out such a delightful and informative organ. Bound in a tasteful stiff green cover, printing, paper, and illustrations are all of the best. The present number contains four whole-page photogravures and several half-tone reproductions, both kinds of pictures being wonderfully good. The articles exhibit a preponderance of attention to critical writing, but there are many useful practical hints to be derived from a study of the pages of *Camera Notes*. Photographs by Miss Johnston, Mr. Hollinger, Mr. W. A. Fraser, Mr. Stieglitz, and Mr. C. J. Berg are reproduced. We advise all who would like to see one of the most artistic photographic publications that have come before us to obtain a sight of *Camera Notes*.

#### PHOTO-MICROGRAPHY.

By EDMUND J. SPITTA, L.R.C.P. Lond., M.R.C.S., &c. London: The Scientific Press, 28, Southampton-street, Strand.

Those of our readers who, last winter, had the advantage of hearing Mr. Spitta lecture on photo-micrography before the Royal Photographic Society and elsewhere, will easily recall the fact that the author handled his subject with the practised skill of a past master of this highly refined branch of work. We were glad to observe that for some months past Mr. Spitta has been extending his theme in the pages of our esteemed contemporary, the *Pharmaceutical Journal*. The time was ripe for a good book on photo-micrography, and Mr. Spitta's admirable articles form the basis of the present very painstaking and conscientiously prepared volume. He eschews theory and the more abstruse aspects of his theme, which he treats throughout in such a plain and practical style that there is not the smallest difficulty in following him into all its minutiae. Indeed, it is characteristic of Mr. Spitta that he dots his "i's" and crosses his "t's" so unsparringly that even an intelligent reader knowing nothing of photo-micrography, would, we are sure, be able quite easily to follow the author's teaching and meaning. Mr. Spitta separates his subject into three parts: low power, medium power, and high power work. The photographic instructions are copious and clear, and, when we come to the purely microscopic side, the author's definitions are commendably lucid and his working directions easily comprehensible. The very latest forms of microscopes are illustrated and described with the utmost fulness, and the student or beginner is not left in doubt as to the best and most suitable apparatus to select for particular kinds of work. In all there are sixty-three illustrations of this kind, and forty phototypic reproductions from negatives by the author and his son, Mr. Harold Spitta, inserted as examples of photo-micrographs produced in the three degrees of magnification above mentioned. Numerous appendices of a very informative kind and a full index complete a work of the highest value to the beginner as well as to the advanced student. The half-tone illustrations do great credit to Messrs. Dent, and the book as a whole is a most useful and instructive one.

#### CATALOGUE RECEIVED.

The Thornton-Pickard Manufacturing Company, Limited, Altrincham, Cheshire.

A GLANCE through the Thornton-Pickard Company's 1899 Catalogue reveals the fact that the famous Altrincham house is quite abreast of the times in meeting the demand, which never ceases in photography, for something new in apparatus or material. Thus the catalogue apprises us that a new time-exposure valve has been devised for use with the well-known Thornton-Pickard shutters. This valve allows of time exposures from one-eighth of a second to three seconds being obtained automatically, a manifest convenience not heretofore available in respect of the minimum exposure. Amongst other novelties to which reference is made in the catalogue are the new Ruby convertible lens, a non-symmetrical doublet allowing of three foci being obtained, a new cycle-luggage carrier, new Ruby cameras, &c. There are a number of excellent illustrations of photographs that secured prizes in the Company's recent competition. The catalogue is sent post-free to applicants.

MESSRS. J. J. GRIFFIN & SONS, Limited, of 20-26, Sardinia-street, Lincoln's Inn-fields, W.C., has sent us a sample of their own brand of ammonium persulphate, the most recently introduced negative reducer. This in every way answers the purpose admirably.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, January 25, at eight o'clock Travellers' Night. "The Hand Camera at Home and Abroad," by Mr. R. Child Bayley.

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, Tuesday, January 24, at 12, Hanover-square, at eight p.m. "The Development of Gelatino-chloride Papers," by John Sterry.

THE AUSTIN-EDWARDS MONTHLY FILM-NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Mr. W. Wright, 29, St. John's-road, Watford, Herts, for his negative, *Wood in Autumn*.

THE following are the names of the prize-winners in the Warwick Monthly Competition for January:—1st prize, 20s., Mr. F. W. Levett, 116, Loughborough-park, London, S.W.; 2nd prize, 10s., Mr. G. Stone, 25, Faringdon-street, Swindon; 3rd prize, 5s., Mr. E. G. Boon, Malino di Sopra, Allassio, Italy.

MESSRS. ARCHER & SONS, of 43-49, Lord-street, Liverpool, inform us that they have taken over the business of Messrs. Wood Brothers, including "Wormald's Specialities," 73, Lord-street, Liverpool, and will continue the business under the same names and address for the present. Wormald's Specialities will in future bear Wormald's name only.

ONE of the attractions of the Paris Exhibition is to be the Mareorama, devised and painted by M. Hugo d'Alési, the well-known poster artist. After duly paying his fee, the visitor will pass a gangway, and find himself on the deck of a first-class passenger steamer, with captain, crew, rigging, smoking funnels, and every other detail complete. Around stretches a blue and sparkling sea, whilst behind may be seen the port of Marseilles fading away on the horizon. Machinery imparts a pleasant rocking motion to the fictitious vessel, and a concealed fan makes a breeze as the traveller skims past Le Frioul and the Château d'If. The sun sets and rises to reveal Naples and Vesuvius, and, having safely passed between Scylla and Charybdis, the good ship reaches in a few minutes the harbour of Sfax in Tunis. Venice will be the next halting place, and finally the passengers glide up the Bosphorus to Constantinople, but a storm must first be faced. The illusion throughout is said to be marvellous.

A SOME memorable in the annals of the weaving industry was, says the correspondent of the *Daily Chronicle*, witnessed on January 10 at the Vienna Technical Art Museum. Herr Jan Szczepanik, the famous young inventor, presented the Emperor Francis Joseph with the first web produced by means of his new photographic process, which was described last May. The silk-woven gobalins is made from a picture by Henryk Rauchinger. It is about two square metres in size, and gives an allegorical representation of homage to the Emperor. The work contains 200,000,000 crossings, 120 silk threads filling one centimetre. Two hundred square metres of pasteboard cards would have been necessary to produce this web according to the present method, and designers would have required many years to carry out the work. Now the designer is abolished, and the work was done in five hours. The Emperor was struck by the marvellous plasticity and delicacy of the picture, which nobody would believe to be woven. Herr Szczepanik demonstrated the process at the Emperor's desire, and His Majesty accepted the gift, and congratulated the inventor.

INTERNATIONAL PHOTOGRAPHIC EXHIBITION.—In connexion with the National Trades and Industrial Exhibition, to be held at Bingley Hall, Birmingham, from March 20 to May 13, there will be a photographic section of considerable importance. Mr. George Stanley, the Manager of the Trades Exhibition Company of London, has arranged with Mr. Walter D. Welford, who is well known in connexion with photographic exhibitions, to take entire charge of the photographic portion. Gold, silver gilt, silver, and bronze medals, and special prizes will be offered for various competitions, and the latter will be arranged to suit all classes, professional, amateur, and novice alike. Mr. Welford at previous exhibitions has always endeavoured to provide something out of the common run in the way of medals, and at Birmingham there will be a specially handsome design, and not of the usual round pattern. Prospectuses will be ready shortly, and may be obtained from his office at 19, Southampton-buildings, Chancery-lane, London, W.C., or from the Trades Exhibition Company, 80, Coleman-street, London, E.C.; and, as the time fixed will be during a quiet time as regards other exhibitions, it will afford a good opportunity for our workers.

## Patent News.

THE following applications for Patents were made between January 2 and January 7, 1899:—

STEREOSCOPIC LANTERN PROJECTION.—No. 27. "Stereoscopic Views for Lantern Projection." J. H. KNIGHT.

"SNAP-SHOT" APPARATUS.—No. 201. "New or Improved Photographic Apparatus of the class known as 'Snap-shot.'" Complete specification. PASCAL & IZERABLE.

"TREATMENT OF PHOTOGRAPHICALLY PREPARED SURFACES."—No. 243. "A New or Improved Apparatus for the Mechanical Treatment of Photo-graphically Prepared Surfaces during the Developing and Finishing Processes." W. F. CRAWFORD.

STEREOSCOPES.—No. 265. "Improvements in Stereoscopes." Communicated by Knackstedt & Nather, Germany. H. H. LAKE.



- EXTINGUISHING KINEMATOGRAPH FIRES.**—No. 317. "A New or Improved Means for Extinguishing Accidental Fires in Kinematographs and the like Instruments." B. VAN DER WERFF.
- APPARATUS.**—No. 332. "An Improved Photographic Apparatus." Complete specification. L. NEUMAYER.
- ARC LAMP.**—No. 338. "Improved Electric Arc Lamp for Portrait Photography." G. W. MORGAN.
- KINEMATOGRAHS.**—No. 389. "Improvements in Apparatus for use in connexion with Kinematographs and similar Instruments." C. W. HOLLIS.
- CAMERAS.**—No. 409. "Improvements in Photographic Cameras." H. H. SHANKS and P. B. W. KERSHAW.
- TRAY.**—No. 412. "Improved Photographic Tray." J. HENDERSON.
- ANIMATED PHOTOGRAPHY.**—No. 418. "An Improved Method of Producing Photographic Pictures for Use in the Representation of Animated or Moving Objects." C. RALEIGH.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
23.....	Bradford Photo. Society .....	<i>The Joys and Sorrows of Photography.</i> P. E. Newstead.
23.....	Camera Club .....	<i>Recollections of Life and Scenery in Many Lands.</i> C. J. S. Miskin, F.C.S., F.I.C.
23.....	Kingston-on-Thames .....	<i>Architectural Photography.</i> H. W. Bennett, F.R.P.S.
23.....	Oxford Camera Club .....	<i>Composition and Selection of Subjects in Pictorial Photography.</i> A. Horsley Hinton.
24.....	Birmingham Photo. Society ..	<i>Demonstrations in Bromide Printing.</i> Harold Barker.
24.....	Camera Club .....	Club House Dinner.
24.....	Backney .....	<i>A Holiday in Switzerland.</i> J. Gunston.
24.....	Isle of Thanet .....	<i>Demonstration: Micro-photography.</i> A. Vigar.
24.....	Lewisham .....	<i>On Reduction and Intensification of Negatives.</i> Mr. Eastwood.
24.....	Royal Photographic Society ..	<i>The Development of Gelatino-chloride Papers.</i> John Sterry.
24.....	Shropshire .....	<i>Tips for Tyros.</i> M. J. Harding.
25.....	Ashton-under-Lyne .....	<i>Prize Slides.</i> Reader, Walter Leigh.
25.....	Croydon Camera Club .....	<i>How to Take a Moving Photograph for 2s. 6d.</i> Birt Acres, F.R.P.S.
25.....	Leeds Camera Club .....	<i>Conversation, Exhibition, and Distribution of Prizes for 1898 Competitions.</i>
25.....	Photographic Club .....	<i>The Hand Camera at Home and Abroad.</i> R. Child Bayley.
26.....	Ashton-under-Lyne .....	<i>Class for Beginners in Photography: Intensification and Reduction.</i>
26.....	Camera Club .....	<i>The Recent Soudan Campaign.</i> W. T. Maud.
26.....	Darwen .....	<i>Lecture: Hand-camera Work with a View to Making Enlargements.</i>
26.....	Liverpool Amateur .....	<i>Southern Norway.</i> Paul Lange.
26.....	London and Provincial .....	<i>Lantern Night.</i>
26.....	Woolwich Photo. Society .....	<i>Enlarged Paper Negatives.</i> H. Stuart.
27.....	Bradford Photo. Society .....	<i>Annual Conversation.</i>
27.....	Croydon Microscopical .....	<i>Photographs of Flowers.</i> H. T. Malby, F.R.P.S.
27.....	Oldham .....	<i>Exhibition of Prize Slides.</i>
27.....	Plymouth .....	<i>A Glance at the Chemistry of some of the Photographic Processes.</i> Edward G. Turney.

### ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 17,—Photo-mechanical Meeting,—Mr. H. Snowden Ward in the chair.

#### HALF-TONE SCREENS.

Colonel J. WATERHOUSE, I.S.C. (Hon. Secretary), read a paper by Mr. J. E. Johnson, on "Some New Half-tone Screens of English Manufacture," in which the author first pointed out the increase in detail obtained by the use of screens of 100, 200, or 400 lines to the inch, and that, with screens of the latter ruling, and with suitable precautions, negatives with a cross-lined ruling might be secured possessing no more actual grain than the wet or dry plate itself, and that consequently the mechanical cross-line effect of the ruling was lost. Still, there were such difficulties in the way of making half-tone blocks with screens of 400 lines to the inch that no process-worker had sufficient confidence in himself to undertake the work. The great drawback lay in the fact that the finest half-tone printing inks contained hard substances, due chiefly to imperfect grinding, which were much larger than the grains of silver deposited in the negative, and consequently not more than twenty-five clear impressions could be obtained without washing the block. A further difficulty arose from the presence of irregularities in the surface of the paper, preventing perfect contact. If manufacturers of paper and ink were to give their attention to these matters, they would soon find a ready market for their goods, but the author of the paper fully recognised the great advances in this respect which have been made in this country in recent years. Although very good results were obtained, even with a cross-line screen of 150 lines to the inch or less, the screen must be perfect to ensure success. The practical difficulties met with in the use of very finely ruled screens were referred to, and the absolute necessity for accurate ruling was insisted upon. Mr. Johnson said he had been occupied for fourteen years in perfecting a method of screen-ruling, by which he claimed to be able to etch

screens with 10,000 lines to the inch, as easily as with 40 lines to the inch, but he declined to reply to questions dealing directly with the means he adopted for the attainment of this end.

The reading of the paper was followed by a conversation in which many members and visitors took part, and which covered a wide field.

Mr. L. WARNERKE asked whether Mr. Johnson coated his glass with a resist and afterwards ruled with a diamond?

Mr. JOHNSON said he coated the glass with a varnish, and ruled with a diamond of the hardest quality. To make screens a man must be his own diamond-cutter, and he must have a thorough knowledge of process work in order that the cutting edge of the diamond might be made to properly answer the purpose for which it was intended.

Mr. SANGER SHEPHERD said the difference in the quality of screens was a question of skill in manipulation, and a perfect screw was of the greatest importance. There was no particular difficulty in getting a ruling machine to work satisfactorily up to 150 lines to the inch, but, beyond that, it was very difficult to get a screw which would allow a plate to be ruled in such a way as to pass a proper test. He had made many screens himself, using as a resist a compound of bitumen, wax, and bezole. The diamond he employed was about one-eighth of an inch long and something less than one one-hundredth of an inch wide.

Mr. DAWSON, comparing the effects obtained by the use of coarse and fine screens, said it was impossible to etch a block to a greater depth than the distance between the lines and the screen. He could not understand why a diamond was used to cut the lines in the resist, and not to cut them on the glass. Why was it necessary to etch at all?

Mr. SANGER SHEPHERD pointed out that one of the greatest difficulties in screen-ruling was to get the diamond to keep its edge, and that, if sufficient pressure were used to cut the glass, it would be hopeless to attempt to rule a screen of only two or three inches. As a matter of fact, when a screen had been ruled, and the resist removed, there was hardly a trace upon the glass to indicate the passage of the diamond, and any attempt to cut into the glass would result in utter failure so far as the screen was concerned.

Mr. JOHNSON said the diamond must not cut, and if it made the slightest possible grey mark, only perceptible under a microscope, the screen would be useless.

Mr. SANGER SHEPHERD detailed the method adopted by Mr. Ives, in the very early days, for the manufacture of screens. He coated plate glass with collodion, exposed to light, developed, intensified, and then ruled through the intensified film in a Richards' ruling machine. Being unable to obtain suitable diamonds, he made a cutter from a piece of watch-spring, hardened by plunging it into frozen mercury.

Mr. WARNERKE said he had adopted a somewhat similar plan, but using a silvered glass, the silver being cut away with a tool made in almost the same way as that described by Mr. Shepherd.

The Rev. F. C. LAMBERT, referring to the question of the respective widths of the black lines and the transparent interspaces, and the size of the dot, in which direction the conversation next turned, expressed his surprise that block-makers apparently used about the same screens, whatever the size of the picture might be. In his opinion, there should be no hard-and-fast rule as to the best size of the dot, which should vary *pari passu* with the size of the picture.

Mr. SANGER SHEPHERD had recently seen some American poster work, about 60 x 40 inches, made with a screen of twenty-five lines to the inch, and, when viewed from the distance at which a poster would ordinarily be viewed, the effect was very good indeed.

The conversation was continued for some time in an unconventional manner, and concluded with an expression of thanks to Mr. Johnson for his paper.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 12,—Mr. A. Haddon in the chair.

Mr. W. D. WELFORD read a letter he had received from Messrs. Burroughs, Wellcome, & Co., regarding sodium-formate toning. As a result of their experiments, they find that the following formula gives the best results:—

Sodium formate .....	7·5 grains.
Sodium bicarbonate .....	1 grain.
Water .....	5 ounces.
Gold chloride .....	0·5 grain.

The new formula differs from the old in the addition of the sodium bicarbonate. This salt serves to neutralise the acid formed during toning, and makes the action of the bath more even and more prolonged. The different chemicals required above are compressed in tabloid form of accurate weight, and, if these are used, one has only to take a tabloid of the formate and bicarbonate (combined), dissolve in 5 ounces of water, and add a tabloid of the gold chloride. Should toning be desired to proceed more slowly, the addition of more water, up to 10 ounces in all, will effect this purpose.

The CHAIRMAN pointed out that Mr. Henderson mentioned that it was advantageous to add carbonate of soda in the case of gold-formate toning, and of formic acid in the case of platinum toning.

Mr. HOWARD FARMER read a paper entitled

#### ABOLISHING THE DARK ROOM. [See page 39.]

At the conclusion of his paper, Mr. Farmer practically demonstrated his propositions. The room was lit by perhaps a dozen ordinary gas jets, none of which was lowered or obscured. At his side he had what he called a shelter, for the purpose of transferring his plates to the dish, an operation which, of course, could not be done in the light of the room. It was a box with a safe-light obtained from a candle placed outside a small window of coloured glass. Seeing that he could not illuminate the meeting room with the light referred to in his paper, for the purpose of the demonstration, he added to his developer a quantity of the dye solution itself, which would, in the ordinary method of development, enclose the source of light. The plate was accordingly placed in the dish in the shelter, the developer, coloured with the



solution of dye, poured on, and the dish then brought out into the light of the room. The plate was perfectly visible, and in a little time the image began to appear. Obviously, when the dish was rocked, the plate would be laid bare, so another dish was placed over the first for the purpose of agitating the solution, but in a room lighted only by the illumination referred to in the paper, when the developer would require no dye in it, this precaution would not be necessary. However, to show the experiment at all, the developer had to be stained in the manner described to take the place of the lamp and liquid colour filter. In due course the plate (Castle ordinary) was developed and fixed. The slight stain was removable in water, or could be instantly discharged by hydrochloric acid. Mr. Farmer passed round a photograph of the spectrum, taken through his colour mixture, showing that its action was to completely cut out all beyond the orange. At present he could not divulge the nature of the colour-filter solution. He was endeavouring to make solid screens of a permanent nature, but, while the liquid screens would last probably seven years in constant use, he had not succeeded in making a glass filter which would not in a little time be seriously affected by light, moisture, &c., and be ruined. The developer used in this instance was rodinal, one in nineteen.

Mr. J. J. SMITH asked whether the dye might be used with other developers than rodinal, or did any chemical action between the dye and the developing agents render this impossible by discharging the colour?

Mr. FARMER hastened to point out that he was not advocating the use of the dye in the developer, but as a filter for the lamp illuminating the room where operations were conducted. The method he had adopted in the experiment was merely to show how much light could be used with impunity. At the same time there was no reason why it should not be used in the way demonstrated with any other developer if so wished, and the cost of the dye stuff would not be prohibitive.

Mr. WELFORD was glad the lecturer was in agreement with himself. He had long advocated a greater amount of light in development than used by the average photographer, but he was surprised at the amount of light which Mr. Farmer had shown could be used with complete immunity from fog, and the plate was as visible as without any dye at all.

Mr. Farmer sketched the form of his lamp on the blackboard. It was an inverted glass dome, enclosing one of smaller diameter, the annular space between the two, of about half an inch, being filled with the dye solution. The inner one required some forty-two pounds of lead shot to keep it down, and the lamp was placed in this.

The CHAIRMAN suggested two beakers as preferable to the cumbersome vessels described; they would stand the heat well, and could be supported by their lips. He thought that all those who valued their eyes would value the method of illumination described by Mr. Farmer, to whom he conveyed the hearty thanks of the meeting.

Mr. FARMER, replying, said that the system was quite complete for those who had no objection to liquid screens. He would be pleased to show the system in operation at the Polytechnic to any who might call between the hours of ten and four, or seven and eight in the evening.

#### PHOTOGRAPHIC CLUB.

JANUARY 11.—Mr. Donald F. Burrage in the chair.

Mr. JOHN NESBIT showed and described a number of examples of the photography of the past. There was a collodion positive of his father, taken in 1853; some negatives on Burgess's emulsion—the first gelatine emulsion that appeared, antedating Kennett; some specimens on Kennett's pellicle emulsion, being an attempt at stereoscopic-picture making with two separate exposures, no binocular camera being available; Stuart Wortley's emulsion; and Mawdsley's Liverpool collodion tannin dry plate, called, in those days, the Liverpool dry plate. Mr. Nesbit also passed round a negative made by Bolton's washed collodion emulsion process, a plate requiring some thirty times the exposure of the ordinary gelatine plate of the present time. All the examples shown were undoubtedly good average specimens of the work of the particular processes mentioned. One of the varnished negatives was affected by some trouble, the cause of which Mr. Nesbit was at a loss to explain. It displayed a milkiness from the edge towards the centre, and the general opinion was that damp was the cause. This damp might have been in the film at the time of varnishing, or the varnish itself might have been charged with moisture, or, again, the damp might have reached the plate at some subsequent period.

**Camera Club.**—There are few persons who will not agree that the best and most luxurious manner of taking a trip to the East *via* the Mediterranean is to do so in a well-appointed yacht, and, if you are so fortunate as to be the proud owner of such a vessel, so much the better, for then you will often have the satisfaction of declaring, as Robinson Crusoe did, that you are monarch of all you survey. The Rev. N. R. Fitzpatrick is such an experienced navigator that one feels an inclination in writing his name to reverse his initials and place them last of all. He owns the steam yacht *Evangeline*, of 230 tons burden, and he gave to the Camera Club on the 9th inst. a vivid account of a recent

#### CRUISE TO THE GOLDEN HORN

in that vessel. The story he had to tell was the story of a yachtsman, and he was able to illustrate his remarks in a very interesting manner by a large series of photographs taken by himself and members of his family who were fellow-voyagers. Among them they carried quite a battery of cameras, and opened fire, as "General" Booth would say, upon everything and anything that came in their way. Most of the plates, &c., were purchased in London before going on board, but it is interesting to learn that three dozen plates of a well-known home brand were procurable at Constantinople in first rate condition. First we were shown a picture of the *Evangeline*, and a very pretty craft she is; then we saw her crew of thirteen men, and her passengers numbering seven. The yacht was absent from England from April 20 to July 18, and it consumed during that time 200 tons of coal and eighty-four

gallons of oil. The fuel was rather expensive, for the Welsh coal strike was in progress at the time, and the lecturer warned his audience not to choose such a time of agitation in the coal trade to start on a yachting cruise. In his case the result was bad coal at 28s. per ton, with a strong suspicion that every ton did not contain twenty hundredweight. The ship had its saloon, state cabins, and drawing-room, and was well fitted up in every respect; it was lighted throughout by electricity, and its owner was prepared to kill or cure, for he carried among his stores a quantity of gunpowder and a liberal supply of castor oil. The vessel was equipped with a steam launch, a cutter, and a boat for sailing, and, as for the crew, "they looked nicer in the picture than when they came up for payment of wages every week," said the lecturer. The vessel covered 6000 miles during the trip, but the owner did not go the whole distance, for he had his Essex parishioners to think about, so he joined the yacht at Marseilles and left the crew to work it home at Brindisi. His absence from London, therefore, only amounted to six weeks. Before the *Evangeline* left Portsmouth Harbour, the owner went on board to see that all was right, the vessel being tried on the measured mile, and her compasses adjusted. Here she nearly came to grief one morning, H.M.S. *Seagull* all but running her down, and smashing a boat that was lying alongside. The lecturer was naturally put out at this *contretemps*, and not altogether satisfied with the apology sent by the admiral from the flagship, and he addressed a letter of remonstrance to the navigating officer of H.M.S. *Seagull*. There was much laughter when he explained that this letter was returned to him, and when he showed upon the screen a photograph of the envelope, endorsed, "Not known. There is no navigating officer on *Seagull*." Later on, as already explained, Mr. Fitzpatrick joined his yacht at Marseilles, and here it was that the first little difficulty occurred. The anchor could not be raised, upon which the harbour master suggested the aid of a diver, and, as this individual was found alongside and ready to dive, it was surmised that there was collusion between the two men. However, for 55 francs the diver went down, released the anchor, and the vessel was borne on its way to Nice. After Nice the yacht proceeded to the beautiful harbour of Spezzia. The lecturer here alluded to the lovely character of some of the Mediterranean islands, instancing Elba as a place which should not be missed. He and his daughter landed here, and walked four miles to a village full of interest and teeming with inhabitants. On their way back in the evening, the fireflies hung like berries of molten metal on all the bushes; never had he seen anything more beautiful in effect. Next the travellers visited Naples, and visited Pompeii and Vesuvius. An excellent photograph of the crater of Vesuvius, belching volumes of smoke and stones, evoked much applause. "There is nothing in the world like Vesuvius, and nothing like Pompeii," said the lecturer. The yacht next went to Sicily, and the lecturer spoke in enthusiastic terms of the beauty of Taormina. Every place visited was photographed with its inhabitants, for the lecturer did all he could in the way of pictorial study of human nature, and exceedingly interesting some of these pictures were. He apologised for a few which were "Salonesque" in character, on the score that the vagaries of King Sol were quite as remarkable in these regions as they are at home. At Taormina there is a remarkable ruined theatre, which Mr. Fitzpatrick was about to photograph when a man rushed out and with violent gesticulations declared that photography was utterly forbidden without a written permit from Palermo, several miles away; but the lecturer knew how to evade this denial, he had simply to show money, and had immediate permission to carry his camera any where he liked. Rounding the toe of the boot-shaped peninsula, the yacht called at Crotone and anchored there, a proceeding which was evidently considered suspicious by the Customs authorities, for their boat pulled round and round the vessel all night. In the morning various traders also came to have a look at the travellers, and, when some of them were told that the yacht was short of mutton, they went ashore and brought back with them a live sheep. The travellers then made their way to Corfu. Here many photographs were taken, the mixed nationalities of that island affording many interesting subjects for the hand camera. These snap-shots, illustrating the home life and different occupations of the inhabitants, were among the most successful of Mr. Fitzpatrick's pictures. The yacht now steamed in a southerly direction, calling at Patras and Corinth, and went at half speed through the Corinth Canal. This recently cut waterway has been blasted out of the solid rock, which forms precipitous walls on either side of the canal. The journey through it occupies twenty minutes, and the toll is about 2l. After a short visit to Athens the travellers left Grecian waters and made their way towards the Dardanelles. Here, by some inexplicable mistake, they lost their way, and nearly ran on the rocks, for half an hour no one on board having the remotest idea where they were. A passing boat gave them their course, and they arrived at the entrance of the Dardanelles at sunset. Then they had to cast anchor, for no vessel is allowed to pass through the Dardanelles during the dark hours. Eventually reaching Constantinople, they visited the mosque of St. Sophia, and saw the sarcophagus of Alexander the Great at the museum. Several interesting photographs were taken here, including some of the crowds of runners who tear through the streets whenever a fire occurs—a thing which takes place very frequently. These men hurry to the conflagration ostensibly to put it out, but in reality to plunder the premises. They are dangerous fellows to come across, for they have a cheerful habit of sticking a knife into any one who impedes their progress. Notwithstanding this and other eccentricities of the unspeakable Turk, the lecturer came away with a better impression of the people than he had taken with him. Such faults as they have are due to the system under which they live and to the traditions under which they are reared.

THERE was by no means a large audience on Thursday, the 12th instant, to hear Dr. C. S. Patterson's able discourse upon the wonders of sea fishing, illustrated photographically, for on that night the wind and the rain were struggling for supremacy, and no one turned out of doors without strong compulsion. But Dr. Patterson had no reason to complain of want of interest on the part of those who did visit the Club, for he had a most attentive audience to address. He began his remarks by expressing regret that the sea angler had not, as yet, attracted the attention of any Landseer to paint him on canvas; what had been done in delineating the successes and failures of the



sea angler was by photography, and the amateur photographer was the operator. A broken reed this amateur photographer often was. Did he hear groans of dissent? Only let his listeners see some of the pictures that he was about to put before them, and they would acknowledge that the remark, though unkind it seemed, was amply justified. Photography in a boat, bobbing up and down on a choppy sea, was not an easy pastime, and, as the best of sea angling necessitated the use of such a boat, it could not be expected that his pictures would be brilliant examples of photography. On a pier it was different, and he would commence by showing a number of pictures of sea angling as carried on at Deal pier. Sea fishing, as a means of earning a livelihood, was one of the very oldest of industries, but sea angling—i.e., fishing with rod and line, a pastime into the mysteries of which he would initiate them that evening—was a very modern thing indeed. Indeed, it dated from only a few years back, when a small number of fresh-water fishermen tried the experiment of catching flounders in shallow sea water with their ordinary tackle. They had such excellent sport that they carried their researches further; but, when they came to try in deep water, they met with but poor results. Shortly afterwards, in 1887, a book on Angling in Salt Water was written by one John Bickerdyke, in which volume may be found a full account of the best kind of rod, tackle, bait, or fly, to use in the endeavour to capture the finny denizens of the deep. The book did not meet with enthusiasm on the part of the critics, but was derided to a considerable extent. The *Saturday Review* a few years later, in a leading article on the subject, said that "the idea of angling in the sea is repulsive to the human mind." Indeed, the whole thing was generally ridiculed. But presently there came a change in public opinion. The number of sea anglers rapidly increased, and the evidence became overwhelming that sport, and splendid sport too, could be obtained by using rod and line from a boat at sea. Then came the foundation of the British Sea Anglers' Society, who made it their business to provide boats, bait, to secure cheap railway fares for their members, and special hotel tariffs. Five years ago the Society numbered ninety members, to-day it has 1000, and it has thirty different stations on our coasts, each with its accredited agent and boatmen. All classes are welcomed to join this Society, provided that they be sportsmen and have a horror of catching fish by trawl, sieve, or in any unsportsmanlike manner. The first attempts to catch sea-water fish with fresh-water apparatus were not successful, because the tackle was unsuitable. The rod must be shortened, the line much thinner, and the winch much bigger to accommodate the length of line—about 100 yards—commonly necessary. Bass and pollock gave splendid sport, not inferior, indeed, to salmon fishing, at far less expense; and, of course, one always had the chance of hooking a monster. Thus at Brighton, not long ago, a shark of between two and three cwt. was caught, and conger eels of great weight were often captured on rocky coasts. Deal is the Mecca of the sea angler, and the lecturer described the method practised there of getting bait and proceeding to sea. He himself was there in late December, fishing off the Bank buoy, which lies a mile and a quarter off the pier, in his shirt sleeves, a record performance for the time of year. He showed a photograph of his catch, consisting of whiting and some large cod. He has known some big takes of sea fish; thus, on one occasion, with three rods, the bag consisted of three congers of an aggregate weight of 56 pounds, seventeen cod weighing 130 pounds, and 200 pounds of whiting. Sometimes a conger so big was captured that it became necessary to either let him go or allow him to have all the boat to himself.

**Croydon Camera Club.**—Wednesday, the 11th inst., was devoted to the illustration of how various magnesium flashlight lamps could be utilised for the photography of groups and portraits. The PRESIDENT (Mr. Hector Maclean, F.R.P.S.), in the course of a few introductory remarks, reminded his hearers that the Club had, so long ago as 1892, demonstrated the availability of magnesium powder for taking fairly large assemblages, when Mr. Oakley photographed those assembled at the first annual dinner. Later, Mr. White employed an ingenious combination of electric current, gun-cotton, and magnesium, with which fairly promising results were obtained. Messrs. Smith and Noaks were also referred to as having used the magnesium flashlight with notable success, as also had the President himself in the photography of children's parties. A brief description of M. Boyer's installation and methods was next given, and prints illustrating all the points raised were shown and circulated. Councillor Noaks and Mr. J. Smith also passed round prints illustrating interesting technical points.

#### SNAP-SHOT LAMPS IN ACTION.

At the close of the President's remarks, which included a warning to novices against using certain mixtures of other chemicals with magnesium powder, e.g., powdered chlorate of potash, sulphur, &c., dangerous explosions being thereby liable to happen, Messrs. J. Noaks, John Smith, Rogers, Isaac, and Watson opened fire upon groups of members. Some of the negatives were straightway developed, with promising results. Later on some character portraits were attempted, a member posing to represent first fine weather, and secondly foul weather. Various other ideas were similarly portrayed. The flash lamps used were mainly of the ordinary character, ignited in pairs. The only exception was a simple, cheap, and apparently effective arrangement made by Mr. John Smith. Briefly, it consisted of two stands, each made by fitting three wooden blind rods on to a small piece of wood, two tripods being thus fashioned at a cost of about threepence. To each of the above stands an ordinary (large bore) clay pipe was attached, the bowl of which had a piece of lamp wick fastened round it. The wick was saturated with spirits of wine, magnesium powder was placed in the bowl, and the spirits of wine being first ignited, the magnesium is blown through the flame, and burns with great rapidity and light. Attached to the stem of each pipe was rubber piping, which joined on to a single length, at the end of which was a bulb, which produced the needful puff of air to blow the powder through the flame. Mr. Smith demonstrated that it was quite possible, though rather inconvenient, to do without the bulb, by simply using his mouth to blow down the rubber tubing.

**Hackney Photographic Society.**—January 10, Mr. W. Rawlings presiding. —The Hon. SECRETARY announced that the Annual Dinner would take place at the London Tavern on the 28th prox. Mr. HASLAM asked if any member

had been able to obtain uniform results when toning with hypo and alum. In reply, Mr. HENSEL thought that the success of the results varied with the brand of paper used. The negative also influenced the result, one with clear shadows being best. The temperature of the solution should be kept steady at from 120° to 130° Fahr. during the whole time of toning, which should take about twenty minutes. Mr. C. H. OAKDEN then gave a paper on the subject of

#### HALATION AND BACKING.

He showed that halation might be caused in two ways: first, by reflection from the back of the plate; and, second, by internal reflection from the molecules of the silver salt. The coarser the grain of the emulsion the greater would be this internal or lateral reflection, and so, by the same argument, the faster the speed of the plate the greater the liability to get halation on account of the greater granularity of the film. To overcome the halation arising from reflection from the back of the plate, many remedies had been brought forward, but at present he had found none to be perfect. The ideal backing should absorb all light; it should be easily removed, and should have no effect on the developer or plate. Mr. Oakden then reviewed some of the various forms of recommended backings. Gummed orange paper was not effective, partly by reason of the difficulty in getting optical contact. A slightly better suggestion was that of purple-bronze paper stuck on with glycerine. Carbon tissue was fairly effective. Bitumen or asphaltum had been highly recommended, but he did not find it to be so good as was claimed. A great number of formulae had been given, in which the chief ingredients were collodion and various aniline dyes. Of these some were better than others. Complaint had been made of the difficulty of removing collodion backing, but this was easily done by the aid of Monkey Brand soap. The speaker thought that there was yet much to be done in finding some convenient vehicle for holding colouring matters as light-absorbers. A mixture of caramel and sienna formed the most effective backing we have at present, but not even this has stood the test in certain difficult cases. As an example of a difficult subject, he mentioned the interior of St. Bartholomew's, Smithfield. He knew of no backing which had been effective in that place. With regard to the backing of lantern plates, he had found anti-halation pads effective for this purpose. Mr. Oakden then showed, by means of the lantern, some results of the tests made with various backings. Mr. FORT described some experiments which had been made by Mr. R. Beckett and himself about two years ago, to find out the comparative values of alleged halation remedies. The result of the experiments showed, among other things, that mixtures of caramel and sienna were effective alone, in proportion to the amount of caramel therein. Caramel used alone, and allowed to dry, was found to stand a very severe test, and prevent halation completely.

**Aston Photographic Society.**—The last meeting of the above was devoted to an exhibition of trade novelties. This is one of a series of similar ideas organized by the Committee of the above Club. The show on this occasion was taken up by Mr. William Tylar, who has made himself so indispensable in the realm of all amateur photographers. He made a capital display, and finished by showing how his patent acetylene lantern lamp behaved in the lantern, as contrasted by the ordinary oil lamps in general use. The thing was a great success, and much approval was elicited as to its simplicity and soundness. Not less interesting was the account given by his active manager, Mr. A. C. Townsend, as to the rise and progress of Mr. Tylar's trade, and many amusing anecdotes were related connected with a novel calendar which he issued years ago, and which humorously mapped out to the amateur a regular weekly routine. After this Mr. Tylar showed the rough models from which his later patents and designs had been produced, and the evolution of articles elicited the remark in the room that Mr. Tylar must certainly be a veritable modern Darwinian. Quaint incidents of trade, related in Mr. Tylar's inimitable style, concluded a most enjoyable evening.

**Leeds Camera Club.**—January 11.—Mr. G. THISTLETHWAITE, of the Bradford Photographic Society, delivered a lecture on

#### WITH CAMERA AND CYCLE IN LAKELAND.

with limelight illustrations. There was a large attendance of the members. The Lake district, said Mr. Thistlethwaite, was one of intense interest to every one, either on a holiday tour or from a photographic view, and it was an undoubted fact that the people of Bradford appreciated its beauties probably to a greater extent than some of their neighbours, and the series of views he should put before them would, he felt no doubt, create a greater interest, if necessary, among his audience to see the district for themselves. To get there it was perhaps best to take train to either Skipton, Morecambe, or Ingleton, and from either centre it could easily be reached in a day with the cycle. He found Ambleside one of the best places to stay at, as from there the several districts could be easily got to, and you are able to get back again in the evening. To obtain precise information, he recommended *Badderley's Guide* as the best, for with it no one need fear taking any of the paths or missing any point of interest. Taking the road from Ambleside towards Conistone, a very fine view of Windermere is opened out, and following on Langdale Pikes. A delightful though difficult subject for a photographer is next before you, and the remarkable echoes near Dungeon Ghyll will be well worth a visit to be heard. Down Red Bank into Grassmere, the grave of Wordsworth can be seen, with charming bits constantly cropping up, and following on to Rydal, at one time the home of Wordsworth, and the whole place so teeming with poetic recollections that the average visitor is very soon, said Mr. Thistlethwaite, humorously, endeavouring to burst into poetry on his own account, and, when he gets the fever, will have it badly. Taking another route from Lakeside Station to Bowness, many interesting and beautiful views may be had, and by taking the left-hand road from Thirlmere the finest view of Helvellyn is obtained. From Keswick, with its quaint market-place, the fine view from Castle Hill must not be missed; and Scawfell, Honister Pass, with the Falls of Lodore, are within easy distance. Mountain-climbing, really difficult and attended with no small degree of danger, can be indulged in by those who desire it, and the actual climbing was beautifully illustrated by a series of slides, which had been lent to the lecturer by a personal friend.



**Plymouth Photographic Society.**—January 13, the President (Mr. H. S. Hill) in the chair.—This meeting inaugurated the spring session, and, after the transaction of ordinary business, one of the Royal Society's papers, on

#### ARCHITECTURAL PHOTOGRAPHY,

by Mr. H. W. Bennett, F.R.P.S., was read, and some excellent slides illustrated the subject. The author treated the subject in an instructive manner, dealing in turn with subjects, lenses, cameras, swing backs, rising and falling fronts, tripods, plates, and exposure, and diagrams were shown to make some of the points clear. A discussion ensued, one member saying that, while it could not be denied that Mr. Bennett had shown some excellent results, he could not help noticing how very much the advice he had given differed from that of other well-known architectural workers. The opinion was also expressed that the lecture was not up to date, inasmuch as no mention was made of the Sanderson camera, Sandell plates, and persulphate of ammonia—a chemical which might be used with beneficial results to the windows of interior negatives.

**Edinburgh Photographic Society.**—Wednesday, January 10, Mr. A. Eddington, F.J.I. (President) in the chair.—The CHAIRMAN drew attention to the forthcoming Exhibition which opens on February 4, at which there are three gold medals, also silver and bronze medals and certificates of merit, to be given. The medals will be struck from the Society's new die, which has been specially designed for the occasion. A paper on

#### PICTORIAL PHOTOGRAPHY: ITS DIFFICULTIES AND PLEASURES,

was afterwards read by Mr. JAMES BURNS, H.M.I.F., who dealt with his subject in a clear and highly instructive manner, illustrating the various points by a large number of most meritorious slides. Mr. Burns, who is a medallist in the photographic art, also used a number of slides to illustrate certain defects. This procedure was much appreciated by a large and enthusiastic audience.

#### FORTHCOMING EXHIBITIONS.

1899.

- |                    |   |
|--------------------|---|
| January 25-31..... | Perthshire Society of Natural Science. C. F. S. Burrows, Hon. Secretary, 16, Princes-street, Perth. |
| „ 30, 31.....      | Southsea Amateur. F. J. Mortimer, Cornwall House, Ordnance-row, Portsea.                            |
| February 4-25..... | Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, 2, George-street, Edinburgh.       |
| „ 13-18.....       | Photographic Society of Ireland. Hon. Secretary, 35, Dawson-street, Dublin.                         |
| „ 21-24.....       | Hastings and St. Leonards. Exhibition Secretary, A. Brooker, 21A, Wellington-place, Hastings.       |
| „ 23-25.....       | Woolwich Photographic Society. Hon. Secretary, F. W. Machen, 161, Griffin-road, Plumstead, S.E.     |
| „ 27-March 4.      | Birmingham. C. J. Fowler, Court Mount, Edington, near Birmingham.                                   |
| March 4-11 .....   | South London. Hon. Secretary, A. E. Allen, 27, Princes-square, Kennington Cross, S.E.               |

## Correspondence.

\*.\* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\*.\* We do not undertake responsibility for the opinions expressed by our correspondents.

#### THE ROYAL PHOTOGRAPHIC SOCIETY AND PROFESSIONAL PHOTOGRAPHERS.

To the Editors.

GENTLEMEN,—In your last issue Mr. T. C. Turner takes exception to some remarks of a previous correspondent on the above question, and in much that he says I entirely concur with him. There are, however, one or two points upon which I am desirous of making a few observations based on fact and experience.

He complains that a certain section of photographers misrepresent the professional in putting him down to be an individual of sordid motives, and suggests that it would be to the public interest if the professional received greater encouragement at exhibitions, increased opportunities for comparison, and the raising of that spirit of emulation so essential to all high endeavours.

That is true, but the change cannot be made from without, it must spring spontaneously from within. Is it for photographers in general to go to the professional in particular and encourage or raise his enthusiasm for the purpose in question? If it is, then one might just as reasonably try to knock down the Great Pyramid with a tack hammer. The professional has no time to take any part in public affairs, whether of exhibitions or otherwise, having already too much to do in his own business. At least, that is what he says or what his actions imply.

In connexion with our Yorkshire Photographic Exhibition at Bradford, we invited all the principal professionals of the city to act on our com-

mittee. Not one of them responded by putting in an appearance. Had they done so, and shown a reasonable interest in an important event, it is possible, if not probable, that some variation of our general policy might have taken place in favour of professional portraiture as it is recognised by the general public. But our experience I know to have been the case elsewhere, nay, everywhere. Professional photographers, and by this term I am content to accept Mr. Turner's distinction of the largest and best, with rare exceptions, will not unite, nor make their influence felt for the well-being of photography as a whole. How, then, can they expect, while this is the state of affairs, when their apathy to all interests outside the immediate limits of their own businesses is well known to all, that others will go out of their way to coax a body of men to do what is very obviously their duty?

It is for professional photographers to raise their own enthusiasm of emulation, and not to expect that others will do it for them.

Mr. Turner then puts the extreme case of a lover of nature, possessed of illimitable leisure and independent of monetary cares, and proceeds to compare him with the hard-worked professional face to face with an exacting public. Where are those possessed of illimitable leisure and independent of monetary cares? They can be almost counted upon the fingers of one hand. The vast body of prominent amateur photographers is composed of men whose photographic work is done in spare moments, snatched from a busy commercial life, simply for love of it.

When Mr. Turner suggests that the Judges at photographic exhibitions are at fault because their verdict does not correspond with that of the general public, he is putting, I am sure, the accent on the wrong syllable. Are we to let our standard be fixed by a few highly cultured specialists, or by a fickle public, devoid of education and taste, rushing after fashions rather than seeking perfection?

It may be too venturesome a statement to make, and it is possible that I am deceived in my views, but I think we shall not have much longer to wait for a more or less complete renaissance of portrait photography. The ordinary photograph is becoming more and more a drug on the market. That photographers are aware of this is evident by the way they constantly reduce their prices. Our photographic exhibitions are doing much to educate the most enlightened section of the public, and, once they begin to emphatically demand better work, the rest of the world will follow suit. Then only the higher ranks of professionals will be able to maintain themselves, and the others will go to the wall.

Let me say, in concluding a somewhat rambling letter, that if Mr. Turner would become a contributor to exhibitions he would find his work received with open arms. We want men of his stamp to attach themselves to all movements for the progress of photography, whether as an art or as a business.—I am, yours, &c.,

PERCY LUND.

Bradford, January 16, 1899.

#### PHOTO-MICROSCOPY FOR WINTER EVENINGS.

To the Editors.

GENTLEMEN,—I was very much pleased with the suggestion which you made a fortnight ago, under the heading "Photo-microscopy for Winter Evenings," to the effect that with an ordinary camera and a short-focus rectilinear lens photo-microscopy could be done.

I welcomed the happy thought as a pleasant relief to the now dull monotony of lantern-slide making and bromide-paper printing; and as I had a good half-plate camera, extending to 16 in. and a  $\frac{3}{4}$ -in. focus lens, all I should want to complete my outfit would be a bull's-eye condenser, a good paraffin oil lamp, and a few microscopical slides, such as you recommended. Being enthusiastic on the matter, I very quickly obtained these, and at once set to work. I had considerable trouble, however, in fitting up a frame to carry the microscopical slides, as it required to have an easy motion towards and from the lens of the camera. With the camera fully extended to 16 in., the first object I tried was one of those suggested by you—the proboscis of a fly. After much manoeuvring I succeeded in getting the object evenly lighted, and focussed and centered on the ground glass; but I was rather surprised and disappointed at the extreme smallness of the object as enlarged on the ground glass, for it was only a little over half an inch long. I next tried the wing of a bee, quite a large object, but not a trace of the hooklets was visible on the ground glass to the naked eye. This was very discouraging; in fact, it was a mere travesty of photo-microscopy. I worked out the matter by the well-known formula, and found that the greatest magnification I could get out of my camera was  $\frac{3}{4}$  diameters. I am sure this statement must bring a broad sarcastic grin to the face of every experienced photo-micrographist, who is accustomed to working up to hundreds, and frequently to thousands of diameters. My decided opinion is that nothing but vexation and disappointment await on those who attempt photo-microscopy without a good substantial microscope, and a set of first-class objectives, ranging from a 2-in. focus to a  $\frac{1}{4}$ -in. oil immersion.—I am, yours, &c., J. B.

#### MARKING PRINTING PAPERS.

To the Editors.

GENTLEMEN,—As Mr. Watkins has called attention to the trouble of distinguishing plates, may I suggest that cut bromide and platinotype



papers are equally confusing in the dark room? I am quite aware of the ordinary methods of distinguishing the plain from the prepared surfaces, but in the dark room the senses both of sight and touch are enfeebled after a time, and it would save much trouble and waste if a spot or line were printed on the back of these cut pieces; and less waste would not tell against the manufacturer's interest in the long run, I imagine.—I am, yours, &c.,  
H. N. G. B.

January 13, 1899.

#### MINERALISED METHYLATED SPIRITS.

To the Editors.

GENTLEMEN,—I think it is due to your numerous readers that the erroneous and misleading statement made by Mr. Thomas Lowry in his article on "Methylated Spirits," which appeared in your issue of the 6th inst., should be corrected. He states that mineralised methylated spirit is quite unfit for photographic purposes. He does not, however, mention a single photographic purpose for which it is unfit. I am an operator in one of the largest, if not the largest, photographic establishment in the United Kingdom, and we use this mineralised methylated spirit for every purpose for which spirits of wine are required, including our extensive wet-collodion lantern-slide work, and we find it quite as good as the spirits of wine we used years ago, which had no mineral oil in it. There is no doubt about the methylated spirit we use being mineralised, for it turns as white as milk on water being added to it.—I am, yours, &c.,

JAS. BISSET.

4, Rosefield-street, Dundee, January 14, 1899.

#### THE HASTINGS EXHIBITION.

To the Editors.

GENTLEMEN,—I shall be glad if, with your usual courtesy extended to officials of photographic societies, you will allow me to draw the attention of your readers to the fact that entries for our Exhibition close on January 31, and that frames, &c., must be sent in not later than February 17. We have had a large number of inquiries, which promise a good show, and, as we have not had a similar Exhibition for nine years, the inhabitants of the town and neighbourhood are likely to take a lively interest in our efforts.

Mr. Wilson Noble, our former M.P., and Viscount Maitland have kindly consented to judge.

A special feature of the Exhibition will be a series of lantern lectures, which will be held in a separate adjoining room during the Exhibition.—I am, yours, &c.,

A. BROOKER, Exhibition Secretary.

21a, Wellington-place, Hastings.

#### THE INCANTO PURIFIER.

To the Editors.

GENTLEMEN,—In your issue of the 13th inst. we notice you have kindly printed a letter from Mr. W. F. Slater, calling attention to our Incanto purifier.

We have to thank him for troubling about the matter, as, in the pressure of business, we had not noticed your report.

May we add that our purifier was in use throughout the Acetylene Exhibition at the Imperial Institute, where it was generally pooh-poohed as unnecessary.

Your readers who visited the Hackney Photographic Society's Exhibition also had an opportunity of noting its efficiency, and the certificate which was awarded us proved the success of this invention when used with the Incanto generator.

We enclose herewith particulars of the apparatus, which has been duly patented, and our excuse for troubling you is that we do not think it quite fair that German apparatus should have all the prominent notices while English ones are overlooked.—We are, yours, &c.,

THORN & HODDLE.

1, Tothill-street, Westminster, S.W., January 16, 1899.

### Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 21, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

#### PHOTOGRAPHS REGISTERED:—

French & Co., 1, Railway-terrace, Walsington.—Photograph, entitled "Breakfast Time."

Wm. L. Shrubsole, 69, Grove-road, Norwich.—Photograph of Royal party, taken at the reopening of Sherbourne Church, Norwich.

RECEIVED.—CINEMATOGRAPH; J. M.; SPOTTER; F. C.; J. P. G.; and others. In our next.

E. W. P.—Mail not's address is Ayr, N.B.

H. CAMPBELL.—Messrs. Adamson, Eldon-street, Finsbury, E.C., supply such lamps.

W. G. ORME.—The address of the Photo chromoscope Syndicate is 119, Shaftesbury-avenue, W.

A. G. BUTERELL.—We believe Messrs. O. Sichel & Co., 62, Bunhill-row, E.C., supply the paper.

BACKGROUND.—DISTEMPER asks: "Will you kindly recommend a book on background painting?"—No such book is published.

HYDROQUINONE DEVELOPER.—A. U. ENDACOTT. Formulae for concentrated hydroquinone developers are given on page 994 of the ALMANAC.

C. N.—Address the Aerograph Company, 30, Memorial Hall, Farringdon-street, E.C., and the Polytechnic School of Photography, 309, Regent-street, W.

R. O'H.—We are doubtful if the slides are still made in this country, but, if you address Mr. W. I. Chadwick, 26, King-street, Manchester, he will tell you definitely.

S.—We should think your experience unusual. We have used the same firm's preparation, older than yours, and having visually the same appearance, without finding that it had lost its reducing power.

Y. Z.—It is, we believe, a silver print, coloured from the back, mounted on a metallic support, and given a hard glaze. We are unable to give the precise details of the process. As you probably know, they are produced by the Craotint Company, Kentish Town, N.W.

F. S.—We should scarcely call the work first class, that is, equal to the best produced; but Nos. 5, 6, 10, and 11 are very good indeed, No. 10 especially so. In the others the lighting is not good, and we should not class them as good likenesses. But, judging you by your best, you appear to be capable of doing very good work indeed.

LENS.—GOLFER. In view of our remarks last week, the Rev. J. Carter Browne, D.D., writes as follows: "It may interest 'Golfer' to know that, in the sixties, many amateurs were using a very good French lens by Darlot. In fact, I had a picture in the 1862 Exhibition taken by a lens of this make. I believe that some of them were minus the maker's name. Possibly your correspondent's lens is a Darlot."

ACETYLENE.—W. BEALES. Calcium carbide in small quantities may be obtained from any who supply acetylene apparatus; but we should advise you to be very careful in your experiments with your extemporised apparatus. Many fatal accidents have resulted from experimenting with extemporised or experimental apparatus by those who do not understand the properties of what they are dealing with.

E. D. FAWCETT.—Obviously the maximum illumination and covering power are required in such a slow process, hence our advice. With regard to formulae, none that have been successfully tried in this country are available. For the most reliable information we recommend you Herthier's book on *Photo-chromie Intéressante*, published by Gauthier-Villars, Quai des Grands Augustins, Paris. It is, of course, in French.

GUM BICHROMATE.—S. THOMPSON writes: "I have been much interested in reading about the gum-bichromate process, and I have just tried it, but cannot get the image to develop, even with a brush. I have worked according to Mr. Packham's method as given in the ALMANAC—well, not strictly to it, for I used office gum, as I have read that answers as well as the gum arabic, and it is much more convenient to me, and I should say to most people also."—In reply: We have little doubt that the failure was caused by the use of office gum. Commercial "office gum" is a very indefinite compound, often quite devoid of any gum whatever. We should recommend our correspondent in future to work with what is recommended, namely, the best gum arabic.

THE LATE ECLIPSE.—T. MATHIAS writes: "I was surprised to read in your Ex Cathedra of last week that the recent eclipse of the moon was disappointing in this country, whilst here (North Pembroke-shire) the sky at the time of the eclipse was exceptionally clear. The moon was of an orange-red colour, standing in relief among the sparkling stars against the deep blue sky, making a most magnificent sight. Now, could I, with an 11-inch Cooke lens, take a photograph of an eclipse that would be of any value? If so, what plate to use, and what exposure would be required?—The photograph would, of course, be very small, but, if good, would be interesting. Any plate with a fine grain would do, but it should be backed. The exposure would depend upon the brilliancy of the moon. If it were an orange red colour, more exposure would be required than if it were of its normal appearance. By a few experiments with exposures on the moon, with the plates that are to be used, a day or two before, the proper exposure will be ascertained.

PLATINOTYPE PRINTING.—TOM REVELLY says: "I have noticed in this week's JOURNAL your two correspondents' troubles ('Platinotype' and 'Platinotype Printer') re the Platinotype Company's A paper. For several months I have been worried with exactly the same trouble. I nearly always get the coarse line, as well as extreme meanness. I have written to the Company, and they say the cause is insufficient development. This cannot be so, for I have left prints in the developer for fifteen minutes at a time, and they have been as badly marked as the others. Damp is also not the cause, or the colour of the prints would suffer. I have no difficulty in getting pure, cold, black tones. Perhaps some of your readers can help us in this trouble. I have used both the Company's D salts and oxalate of potash at every possible strength, from a saturated solution downwards. I have also tried old baths, and part old part new, also a perfectly new bath, all with the same result."—In reply: Some correspondent may help with a suggestion that will avert the trouble complained of.

\* \* Owing to great pressure on our space, several articles, Editorial Table, and other communications are unavoidably held over.



# THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 2021. VOL. XLVI.—JANUARY 27, 1899.

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### EX CATHEDRÂ.

WE are officially informed that, although the regulations and terms affecting the question of taking photographs at the Paris Exhibition of 1900 have not yet been definitely settled by the Commissaire-Général, no monopoly will be granted, and photographers of every country taking part in the Exhibition will be allowed to practise their art on equal conditions and terms of payment.

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PROFESSOR CLEVELAND ABBE, in an American contemporary, recently dwelt upon the advantages which German scientific investigators possess over those of other countries by reason of the excellent national system of training so long in force in the Fatherland. He points out that a mistaken idea has widely prevailed that the investigator is a genius, born and not made. The history of German science has, however, shown that environment and training are as important as birth and inheritance. The whole system of education in the German universities has for five generations been directed to the development of the investigator as its highest product. Those who discover important new facts, laws, or principles, have been

rewarded with the highest places in the intellectual world of that nation. Those who feel that they have a desire or calling for scientific research are encouraged to study for the degree of doctor of philosophy, a degree that is only granted when the candidate has, by actual observation, experiment, or exploration, made some important contribution to human knowledge. The professors under whom he studies have, in their turn, made many similar contributions, and are well prepared to judge of the value of his work. The German universities have, during the past seventy years, published over 50,000 so-called "doctors' dissertations," embodying the results of the works of 50,000 candidates. The consequence is that to-day Germany easily leads all the world in the amount and value of her contributions to human knowledge and the energy with which her students pursue the study of nature. What the Professor here says with regard to science in general applies with equal force to photographic science in particular. The facilities for studying photography scientifically and systematically in Germany, as we have many times before pointed out, find no parallel in Great Britain, where private effort, almost entirely without state aid, has to take upon itself the responsibility of maintaining and encouraging original investigation work. The munificence of Dr. Ludwig Mond established the great physico-chemical laboratory in Albemarle-street the other day; but things of this kind should be done by the State and not left to private initiative. In not a single one of its aspects does photography owe the least encouragement to the State. Far different is the case in Austria and Germany, as the establishments presided over by Eder and the late Dr. Vogel abundantly testify.

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SEVERAL times of late the hydrofluoric acid method of stripping films has been referred to, and the inconvenience attending its employment objected to. But for these there is no question that the fluoric acid method is the best; the inconvenience is, however, much increased by using the acid solution much stronger than is really necessary. Most of the published formulæ are unnecessarily strong. Of course, the stronger is the solution the sooner is the film loosened, also the more the fumes from the acid pervade the place. Half a dozen drops of the commercial acid, or less, per ounce of water will suffice, if a little longer time be given, and then there will be less fumes to pervade the apartment and act upon the vitreous matter about.



There is one caution we may give with regard to the use of fluoric acid, which we do not remember having seen given before. Some of us have, unfortunately, to use spectacles, the glasses of which will in a short time become dimmed with the fumes of the acid, and there is no means of cleaning off this dimness without repolishing the glasses; therefore, when working with fluoric acid, an old and disused pair should be worn when using this method of stripping. For the same reason all photographic lenses should be put away secure from its fumes when employing fluoric acid. Glass exposed to the fumes of fluoric acid makes the finest ground glass that can be made for focussing screens, and this shows how necessary it is to protect our spectacles from its action when working with it.

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As will be seen in our issue of last week, Herr R. E. Liesegang, in our contemporary, the *Photographische Correspondenz*, points out the advantages of exposing plates from the back, and claims that the results are similar to those obtained on multiple-coated plates. There is another advantage gained by this system of working, namely, the avoidance of halation from the back of the plate. This we have more than once pointed out with reference to the taking of reversed negatives for collotype and other mechanical processes in which reversed negatives are necessary. It is a common practice with process workers to take the negatives, whether by the wet-collodion process or on dry plates, through the glass, thus avoiding the use of a prism or reversing mirror, and at the same time avoiding halation, so prevalent when dealing with strong contrast with gelatine plates.

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AFTER ten years' service to the Hackney Photographic Society as its Honorary Secretary, Mr. W. F. Fenton-Jones retires from that position at the end of next month. Such a record of gratuitous and uninterrupted devotion to the interests of a photographic society is almost, if not quite, unique—at the moment, at any rate, we are unable to recall an instance in which Mr. Fenton-Jones is outdone as to length of years in office. That gentleman was one of the founders of the Hackney Photographic Society, and he has the satisfaction of knowing that the work he has accomplished on behalf of his Society has not been without its beneficial influence on photography at large. Some of the ablest photographers of the day belong to the Hackney Photographic Society, whose annual Exhibitions, moreover, have for long ranked only second in interest and value to those of the Royal Photographic Society. In all this good and useful work Mr. Fenton-Jones has borne a leading and unselfish part, and we are glad to hear that at the forthcoming dinner of the Society he will be asked to accept a testimonial in recognition of his ten years' gratuitous efforts as its Honorary Secretary. Testimonialising is sometimes grievously overdone, but Mr. Fenton-Jones right richly deserves the concrete compliment proposed to be offered him, and we are sure it will not be unworthy of its recipient.

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REFERENCE was made last week to new regulations adopted at a recent meeting of the Pharmaceutical Society with regard to the sale of poisons as well as to the keeping of them. These new regulations seem to be highly necessary if one may judge from the careless way poisons are sometimes vended by those entitled to sell them—the Pharmaceutical Chemists—as often evidenced in the Coroners' Courts. At present the only ones

permitted to vend the poisons mentioned in the Poisons Act of 1868 are the Pharmaceutical Chemists, and the enforcement of the law, for its infringement, has hitherto vested in the Pharmaceutical Society. As we have frequently pointed out before, it has not been at all remiss in this direction in the case of photographic dealers, oilmen, and others, who happened to sell anything required for industrial or experimental purposes, if it is named in the Act, to secure their (the Society's) five pound penalty and costs; but how many prosecutions, it may be asked, has it instituted against members of its own body for infringing the law, even when flagrant cases have been laid before it by coroners and by the police authorities? Echo answers, How many?

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It may be remembered that last year a Poisons Bill was introduced into the House of Lords by the Privy Council, and was passed through committee, but by press of other business it suffered at the end of the session in the "slaughter of the innocents." This Bill, had it passed, would have taken the exclusive monopoly in the sale of poisons used for industrial purposes out of the hands of the Pharmaceutical body, as well as the enforcement of the law, as it provided that the Privy Council was to have the same rights as are at present vested in the Pharmaceutical Society. As the Privy Council have long seen the necessity for such an Act, there is every probability that the matter will not be allowed to rest. In Germany the control of the sale of poisons is vested in the local police, and with them rests the enforcement of the law, which, like most German laws, is very stringent, entailing, as it does in this case, heavy penalties or imprisonment. In Germany the sale of poisons is not restricted to pharmacists, but to licencees of the police authorities. Would it not be better that such a condition of things should obtain here with regard to the keeping and sale of such poisons as are required for industrial purposes? The police are better able to safeguard the public than the Pharmaceutical Society have hitherto done, as they would proceed against chemists for violation of the law as well as against photographic dealers, oilmen, &c. The German law regarding the sale of poisons commends itself to our Privy Council for consideration.

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THE Commissioner of Patents in the United States has given a decision which is of importance to applicants for patents in this country as well as in America. He holds that the date of application for an English patent is the date on which the original application was filed, even if it had been accompanied only by a provisional specification, the reason being that, according to English law, provisional protection is not analogous to a caveat, and the patent, when granted, is dated as of the day of application, instead of bearing the date of the actual grant or issue, as is the case in the United States and some other countries. A new statute came into force in the United States on January 1, 1898, which provides that a would-be patentee who had first applied for a patent in a foreign country will not be debarred from receiving a patent for the invention in the United States, by reason of its first having been patented abroad, unless the application for said foreign patent was filed more than seven months prior to the filing of the application in the United States. Those who apply for patents in this country, and desire to also protect their inventions in the United States, should therefore apply as promptly as possible in America.



It is announced that the business of the Eastman Photographic Materials Company, Limited, is now being carried on under the title of 'Kodak, Limited, successors to the Eastman Photographic Materials Company, Limited.' This answers many inquiries that have been addressed to us on the subject.

### SYSTEMATISED PRINTING.

WITHIN the last decade the principle of leaving as little as possible for guesswork or rule of thumb has by degrees almost reached the stage of a science. Our plates are marked with a fair approximation to an exact speed indication, thanks to the labours of the late Dr. Hurter and his colleague Mr. Driffeld; we have exposure meters innumerable which, at any rate, profess to give the correct exposure under any given circumstances; and, in a belated fashion (for the method was proposed ten years before it was adopted), every lens sent out has its diaphragms marked with numbers which, virtually, are applicable to all lenses, and number for number represent identical exposure values; but, when we criticise printing methods, what do we see? A negative is put out to print, and it is examined at intervals to see how it is getting on. Where large numbers of frames are put out to print, we see in some establishments a certain amount of grading of their printing values, and putting similar grades in batches, which are all exposed and turned down at a time; but how many photographers refer their negatives to a particular standard, and classify and label them in accordance? We remember its being narrated in these pages how a certain well-known expert operator, in the times when lenses were few, prided himself upon his knowledge of the working rapidity of all known lenses and all their stops, such knowledge being looked upon as special and unusual; but nowadays the merest schoolboy has only to look at the diaphragm numbers and he is able to use a dozen different lenses with a uniform illumination, thanks to the "Uniform System," universally shortened into "U.S.," this name and abbreviation being adopted from a suggestion of our own at the time the system itself gained the sanction of the Royal Photographic Society. In the same manner the working value of a printer is largely influenced by a reply to the query, "How many printing frames can he attend to?" We say that such a standard ought to be as much out of date as that of the operator and his lenses we refer to. We go further, we say that, with a young lad to read his indicator or meter, there is no reason whatever why a blind man should not undertake to do wholesale printing and attend to twice or thrice the number of frames an expert printer is now expected to undertake. It will, of course, be understood that we refer to plain, straightforward printing, where no shading or printing-in is needed. When it comes to a question of artistic printing where one part of a negative which is too weak requires less printing, and another over-dense portion has to be exposed to light action for a longer period, we do not deny individual attention. Artistic taste and skill is needed then, photography cannot be reduced to the level of mathematics in such cases—a fortunate thing, too, it is for the professional photographer that in this, as in other departments, artistic fingers informed by experienced brains are needed; otherwise "their occupation is gone."

But to return to practical, every-day, straightforward printing. We would make a suggestion. There are meters to be purchased at a reasonable price, and graded for the particular purpose we are endeavouring to bring into use. If these,

moderate in price though they be, should be beyond the purse of the printer or small amateur, it is a very easy matter for every one to make a meter for himself by the method often described of pasting together layers, successively increasing in number, of either tissue paper or slightly coloured gelatine, and using it for classifying every negative he possesses. Suppose a meter of ten graduations—the first shade representing the thinnest, and the last the densest probable negative. All that is necessary is to put the meter and the negative to print at the same moment and to turn down the meter the same moment the print is turned down. The number of the tint is read, and is marked upon the negative. Taking it, say, for example, as tint 3, then all negatives of tint 3 may be turned down at once when the meter shows 3; the same with 1, 2, 4, 5, to the end of the series. Let our readers imagine for a moment what an immense saving of time, what exactitude of correctness of printing would be brought about by such means—the labour of numbering each negative the first time it was printed from would be looked upon as trivial in the extreme.

An objection may be urged that a standard paper, always uniform, would be needed. As a matter of fact, such paper can easily be made, and is indeed an article of commerce available to any one who likes to try it. A further objection might, with some colour, be raised, that the indications given by the standard paper might not be equally applicable to albumenised paper, P.O.P., and collodio-chloride paper; and the objection would, to a certain extent, be well grounded as far as it went. The number would only be applicable to one particular kind of paper, for it is well known that the quickness of printing of different kinds of sensitised paper varies enormously. Taking the 1 or 3 just referred to to relate to the P.O.P., it might need the meter to show No. 5 before the albumen was sufficiently printed. All then that would be necessary would be to add a letter, say, A, C, or P (the initials of the three common printing papers made) to be attached to the meter figures with which the negative was tabulated. When all three kinds are liable to be employed, all three initials, with their respective meter numbers, should be marked on the negative, and so the system rendered complete.

We think we have said enough to show the desirability of bringing printing operations into line with the more scientific method of procedure which characterises so many other branches of photography, and we strongly advise every one of our readers to adopt some one or other of the meters to be had or made, and so systematise the process of silver printing.

**Coagulation of Albumen.**—The employment of citric acid or citrates in the making of sensitised albumenised paper is well known, and some explanation of its function may possibly be found in the discovery of M. G. Halpden, published in the *Journal de Pharmacie*, &c., of the peculiar action of citric acid or a citrate in the coagulation of albumen. He finds that this coagulation is complete in the presence of citrate salts or ammoniacal salts.

**Defining Power of Lenses.**—In a recent discussion at one of the metropolitan societies, the question of the definition yielded by lenses was raised, and it was said that photographic lenses were not constructed to yield microscopic definition. That is so in the strict sense of the term, but the majority of them by the best makers, particularly those of the older forms, were so constructed that they would yield far finer definition than gelatine plates of the usual rapid type are capable of rendering, by reason of the coarse-



ness of the particles of silver that form the image. Where, then, it may be asked, is the necessity of the optician expending his skill to make lenses to give such fine definition when the plates to be used with them are incapable of doing justice to it, particularly when they can give us compensating advantages in other directions? There is no question that some of the older forms of lenses, when well constructed, do give finer definition than do some of the newer forms, that is, when used on plates—say wet-collodion or albumen—that are capable of recording it.

**What does it Mean?**—A correspondent sends us a card with a halfpenny affixed stamp which he has received through the post. It is as follows: "Blackwater, Hants" (no date). "Dear Sir, I shall be glad to have particulars of your life for the *Biographer*. Yours truly, ———," the address, the request, and the signature being in three different handwritings. Our correspondent says, "Fancy being requested through the halfpenny post to send 'particulars of your life' to an unknown individual." He adds, facetiously, that, "so far as I know, there is nothing in the particulars of my life that would interest the readers of publications either of the 'goody-goody' order or the 'penny-dreadful' type, or even, I am happy to say, the authorities at Scotland-yard, let alone those of the *Biographer*, if there is such a publication." He further says, "I am only a photographer, and, as I have never heard of such a publication as the *Biographer*, and it is not known at Smith's bookstalls, neither does it figure in *Sell's World's Press*, I ask if you can tell me what is the scheme? You have often told us about the 'free-portrait dodge,' so perhaps you or other photographers can tell us something about this affair?" At present, we cannot; but we do know that others, who are not photographers, have received similar cards requesting "particulars of their lives."

**Properties of Pure Carbide of Calcium.**—It is now well known that some, if not indeed all, the offensive smell of acetylene gas, as usually found, is owing to the presence of impurities, notably phosphorus, which, besides giving the unpleasant odour, confer also an element of danger upon the gas. M. Henri Moissan has described to the French Academy of Sciences the properties that should characterise pure carbide of calcium. When absolutely pure, it should be quite colourless and transparent. If any colour be shown, it is a sign of the presence of foreign matter, iron, for example, giving a reddish-brown tint to the mass. It is quite evident that as the present price of commercial carbide causes the gas to be too expensive, in most cases, to compete with coal gas, the pure form mentioned can only be looked upon as a chemical curiosity. Still there have been published methods of purification which, it is stated, leave nothing to be desired on the score of freedom from smell.

**Deodorising Benzole, &c.**—Acetylene is not the only material used in photography whose odour is sometimes a bar to its employment. Benzole would be more frequently used as a varnish basis but for its disagreeable smell. This is so peculiar and, in a way, unvarying, that it might be looked upon as a necessary characteristic; but, according to a foreign contemporary, it need be no longer so looked upon. Herr Beringer has devised the following method for deodorising benzene:—To a mixture of 1½ litres of sulphuric acid and 1½ litres of water add, after cooling, 30 grammes of potassium permanganate. Next mix with 4½ litres of benzene, and allow to stand for twenty-four hours with occasional shaking. The benzene is then siphoned off, and agitated for several hours with a solution made by dissolving in a litre of water 7½ grammes of potassium permanganate and 15 of sodium carbonate. It is stated that the benzene, when finally separated without distillation, will be quite colourless and devoid of odour. Should such a prepared benzole be placed upon the market, it is likely to have a ready sale for photographic purposes in many directions. We can readily believe in the possibility of this removal of smell when, to our knowledge, that usually most offensively smelling liquid, bisulphide of carbon, can be made absolutely free from smell, though it is true that, after being kept a while, there is apt to be a recrudescence of its original nature in that respect.

**Gale's Double Microscope.**—With regard to the inventor's account of the performance of this instrument a correspondent of the *English Mechanic* states that it does not appear to be different in principle to one described to the Royal Society in 1870 by Dr. Royston Pigott, who gave particulars of his observations on Podura scales, the usual interpretation of the latter being, he stated, incorrect; his results, however, were not reproduced by other experimenters, and were in consequence stated to be spurious and his theory incorrect. The writer of the letter found the matter interesting, but he was never able by means of the high magnification of the double microscope to obtain a differentiation that he could not obtain by other usual means.

## DEVELOPMENT, INTENSIFICATION, AND FIXING IN ONE OPERATION.

### III.

TAKING Mr. J. B. B. Wellington's formula as the starting point, the relative proportion of silver, sulphocyanide, and hypo may be left substantially the same, the quantity of water alone being decreased in order, for the sake of convenience, to make a more concentrated solution; or—and this I think the preferable plan—the proportion of hypo may be decreased in making the solution, and the exact quantity adjusted by the addition of a few more crystals to the mixture on trial.

Let the formula be set down as follows:—

Nitrate of silver.....	100 grains.
Sulphocyanide of ammonium .....	200 "
Hypo .....	150 "
Water .....	2 ounces.

I do not find it necessary to dissolve the salts in separate portions of the water, though it is preferable to dissolve the silver first, and, when dissolved, to add the sulphocyanide, which will at once cause a dense, curdy precipitate, which becomes less, though it does not wholly disappear, as the sulphocyanide dissolves. When the crystals of the latter salt have disappeared, or nearly so, the hypo may be added, and this will form a clear solution long before the whole is dissolved, and it might be supposed that the quantity of hypo is in excess of what is necessary; but, although in this state of concentration a very small quantity of hypo seems to make a clear solution, under those circumstances it will not bear the slightest dilution without forming a precipitate, whereas it is required to add only a few drops of the silver solution to a comparatively large volume of developer without causing any more than a very slight precipitate, and that not immediately.

Where, therefore, the solution has been made according to the above proportion, it may be adjusted in the following manner. If a single drop be allowed to fall into a large quantity of water, an instant opalescence will appear; but, if two or three drops be added to, say, a couple of drachms of water, there may or may not be an immediate precipitate according to whether the sample of hypo happens to be fairly dry or contaminated with a large proportion of water. It is this uncertainty as to the quality of the hypo that leads me to recommend this method of final adjustment. The object to be aimed at is to use only as much hypo as will prevent the formation of a decided opalescence for several seconds after dilution to the extent mentioned, which represents approximately the proportion in which the silver solution is to be added to the developer when it is desired to start intensification. If precipitation takes place directly the silver solution is dropped into the water, or within two or three seconds, then a few more crystals of hypo are added to the "stock," and shaken until dissolved, and the trial repeated until the mixture remains clear for at least ten seconds.

In this condition and used in the proportion of half a drachm of silver solution to two ounces of developer, the precipitation of the silver is very gradual, and as it is thrown down it comes under the power of the developer, and is at the same time reduced to the metallic state, and if the quantity of silver used is properly adjusted to the strength of the developer, every portion of it is deposited on the image in building it up on intensification. If too much silver be



used for the strength of the reducing solution, the developer will be rendered "muddy" from the too rapid precipitation, either in the reduced or unreduced state or both, and most of the metal will be wasted by deposition on the sides of the dish or loosely on the surface of the film. If the strength of the developer is normal and it contains the usual proportion of bromide, the colour of the precipitate will be dirty yellow or light brown, since it will consist of a mixture of bromide and sulphocyanide of silver in excess of what the solution is capable of reducing all at once to the metallic state. In such a case intensification proceeds in due form, but slowly, and eventually, if no more silver be added, the solution becomes clear once more, partly by reduction and partly by being taken up again by the gradually exhausted sulphocyanide and hypo.

The reducing action of the alkaline pyro, or whatever may be the agent used, appears to be exercised first upon the silver salt in the nascent condition, or in the act of being thrown out of solution. If it is thrown out in larger proportion than the reducing agent is capable of acting upon at once, a portion of it takes the form of a comparatively coarse precipitate, which retains that form until, by the gradual reduction of the more slowly and finely precipitated material, the solvents in the solution are left in a position to redissolve it. Then, under the reverse process of solution, it again comes within the power of the developer and intensification proceeds continuously. Thus it does not matter much if too much silver, in moderation, be added at once, since it eventually comes into use. The intensifying solution may, of course, be kept clear by the employment of a larger proportion of the solvents sulphocyanide and hypo; but then it follows naturally that a larger quantity of silver must be used in order to afford the necessary supply. In fact, the larger the proportion of hypo, especially, the slower will be the intensifying action, and the larger the quantity of silver solution necessary. The rapid and economical working of this intensifier seems to depend entirely upon the solution being adjusted to what I have already described as that state of "unstable equilibrium" that supplies the necessary quantity of silver just as it is required by the reducing solution.

So far I have spoken only of the employment of a reducing solution of normal strength, such as would be used for ordinary developing purposes, but by increasing the reducing power a much larger proportion of the silver solution may be added and dealt with at once, and the intensifying action not only hastened, but greatly increased, though at the risk of coarseness and unevenness of deposit. The chief beauty of the method lies in the fineness and evenness of the image formed when it is properly applied; but this, as in all other similar processes of deposition, entails a comparatively slow or gradual action. Moreover, going back to the title of this article, if we are to combine the operations of development, intensification, and fixing, or even the two first only, we are practically limited to the use of the normal developer and the minimum quantity of silver solution, since any increase in the reducing strength would cause inevitable fog unless a much larger proportion of the silver solution were employed, in which case fixing would take place before development commenced. There lies the difference between the Wellington process pure and simple and the modification I am describing. The former is intended only for use after fixing, and if used before would "clear" a collodion plate instantly, and a gelatine film, unless it contained a large proportion of iodide, long before the image had arrived at maturity.

In the earlier part of this series of articles I stated that it is quite practicable to combine the trio of operations in one, at least with collodion plates, but that I was doubtful about the application of the same method to gelatine. Since that statement was made I have turned my attention to gelatine, and find that, while it is possible, and indeed, by the exercise of some patience, easy to develop and fix with the same solution, the process is not a very useful one. For reasons already stated, it is necessary to keep the fixing strength of the solution down low enough to permit development to run its full course, and this, owing to the much greater thickness of gelatine films and the larger quantity of silver they contain as compared with collodion, makes the fixing operation a painfully long one, during which period intensification is going on continuously; in

fact, long before the film is fixed both development and intensification are complete, and when fixed, or at least apparently fixed—"cleared" we will say—the image has become hopelessly over-dense. Even then, looking at the very small proportion of fixing salts contained in the solution, it would be in the highest degree unsafe to trust such a negative to stand without further fixing in strong hypo; for which reasons we may dismiss the possibility of combining all three operations with gelatine.

But, if we confine ourselves to two, development and intensification, there are circumstances under which this method becomes extremely useful, whether with plates or films that have a natural tendency to thinness of image, or wherever, from over-exposure or the character of the subject, it is desirable to obtain greater density or contrast. Under any of these conditions the addition of a very small quantity of the silver solution to the developer will bring about a wonderful alteration in its behaviour. The addition may be made at the commencement of development, when the necessity for extra contrast is known or suspected, or at any later stage when that need is recognised. The quantity of silver used must, under these circumstances, be very small, not more than from five to ten minims in two ounces of developer; if added at the commencement the smaller quantity should not be exceeded. It is better, then, to commence with only one or two minims, and to add more if the progress of development shows it is permissible. The quantity of silver thus added to the solution may seem too small to produce any appreciable result, but it must be borne in mind that, as this is reduced, the solution feeds itself at the expense of the sensitive film, and, by dissolving minute quantities of silver bromide, keeps up a continuous process of intensification. Especially in cases of over-exposure this self-feeding process is valuable, because by attacking the surface of the film it dissolves away the feeblest portions of the impression, and thus helps to prevent the clogging of the shadows that always follows over-exposure. For the same reason it is better not to add the silver solution on commencing development except it be desired to create contrast, as, for instance, in black-and-white or "process" negatives. In the latter connexion I believe it will be found especially valuable, as, where the exposure has not been needlessly curtailed, practically any density can be obtained without the least risk of fog; on the contrary, the addition of the sulphocyanide and silver solution gives a clearer result than when it is not employed, owing, no doubt, to its solvent action on the surface bromide. Of course, a line must be drawn between fog by reduction and the deposition of a dirty deposit that can be rubbed off the surface of the negative; this will often occur both on back and front of the plate, and present anything but a pleasing appearance; but it is easily rubbed off, leaving the shadows absolutely clean.

Applied to gelatine films simply as an intensifier after fixing, I have no hesitation in saying that this method will give an equally good result in the same or, if desired, a much shorter time with a less expenditure of silver. I have already mentioned that, by increasing the reducing power of the solution, a larger proportion of silver can be added and the operation rendered more rapid. Obviously, after fixing, we are not limited as to the proportions either of pyro or ammonia that may be used without causing fog, because there is no silver in the shadows to reduce, and any that may be thrown down from the solution by abnormal action remains either in suspension or is deposited evenly on the film in a loosely adherent manner that leaves it capable of removal by friction. Intensification proper only takes place on the image already existing; consequently, by adding small successive portions of silver solution to a strongly alkaline solution of pyro, intensification proceeds rapidly and with a minimum of silver. I can get more than necessary density on a half-plate previously too thin to print with the expenditure of half a drachm to a drachm—the latter in case of extreme thinness—of the above solution, which means from three to six grains of silver nitrate; with the Wellington formula, two ounces of intensifying solution would contain nearly forty grains of silver. In using the process in this manner, after fixing and slightly washing the film, I "squirt" into the developer, by means of the dropping tube, half a drachm or a drachm—the quantity does not matter much, so long as it is sufficient—of ammonia solution, the same or



rather less of ten per cent. bromide, and, last of all, about ten minims of silver solution, and go on adding more of the latter till density is obtained. Bromide in this case acts as an accelerator by putting the silver in a more easily reducible condition.

W. B. BOLTON.

### PRINTING OUT.

CHLORIDE of silver printing-out paper contains a considerable addition of free nitrate of silver. This is necessary, as the pure chloride of silver would otherwise give too weak an image. The silver nitrate is looked upon as a chemical sensitiser, and as an absorber of the chlorine liberated from the silver chloride during exposure. If this reaction really takes place, then there must be less silver nitrate in the exposed, as compared with the unexposed, parts of the film. I have observed a number of phenomena which indicate that this actually takes place. They seem to me worthy of enumeration, since they may explain various facts. I have already drawn attention to one of these phenomena in the *Photographische Correspondenz* (1898, p. 9) as follows: A plate of glass was coated with a solution of gelatine containing gallic acid. When set, a gelatino-chloride print was placed in contact with it. The print developed to full strength, and upon its removal a negative image of the print was observable upon the film of gelatine and gallic acid. The silver nitrate had by diffusion passed from the print into the gelatine film, and been then reduced by the gallic acid. I left the explanation of this phenomenon an open question. It is very probable that no diffusion took place under the fully exposed parts of the print, because little or no silver nitrate was there to diffuse, as may appear from the following considerations.

A similar observation was also made when a gelatino-chloride print was placed in contact with a gelatine film containing chloride of soda. A negative image then formed of chloride of silver.

But it is not necessary to use jellies to observe such variations in diffusion at the exposed and unexposed parts of a print. If a printable gelatino-chloride plate is immersed in a platinum toning bath which contains a little chloride of soda, those portions of the film which have received little or no exposure to light will be covered with a deposit of silver chloride, and the dark portions of the plate will not be thus affected. This freshly formed chloride of silver is on the surface of the film and may easily be removed by friction. (If we adopt the theory as true that the amount of free silver nitrate diminishes with exposure to light, the variations in diffusion are easily explained according to the propositions I have formulated in my work on *Chemical Reactions in Gelatinous Substances*, viz., that silver nitrate can only pass from the film if its solution is molecularly superior to that of the chloride.) Similar deposition may be observed upon the unexposed portions of a chloride print when it is immersed in a gold bath with little or no previous washing. It is not even necessary to study the behaviour of plates and papers when immersed in baths in order to find these peculiar phenomena of diffusion. I came across a number of old unfixed albumenised paper prints, which had been stowed away in the dark for years. It is well known that the backs of such prints turn brown after long keeping. This discolouration may be traced to a reaction between the free silver nitrate and the organic matter of the paper. In these prints the discolouration was absent from the back of the paper at those parts where the print was deepest. On the other hand, the high lights of the print corresponded with the dark areas on the back, which had the appearance of a vigorous negative. The phenomenon is easily accounted for by the theory I have put forward above. The silver nitrate had diffused into the paper; but, as it had been used up in the fully exposed portions of the picture, the corresponding portions of the back had not turned brown. Similar negative images may be found under certain conditions upon the backs of physically developed chloride prints which have received short exposure, and may be similarly explained. I have observed them when prints have been left in the dish a considerable time without rocking and with only sufficient developer to keep them moist. Under normal conditions these phenomena never occur. The possibility of solarisation with physical development may also be inferred from the deficiency of silver nitrate from the fully exposed portions of the image. It is known that gallic acid is not the developer in this case, but nascent silver, and it is difficult to understand why intensification should not take place; but I have noticed that strongly exposed parts, such as the unprotected margins of prints from dense negatives, do not blacken further. This may be taken as the beginning of solarisation, as other portions which have had much less

exposure become much denser. In the collodion process something similar is also possible.

In conclusion, I may mention an experiment for estimating the distribution of silver nitrate in a visible chloride of silver print. If albumen is brushed upon such a print, it should be coagulated by the silver nitrate in the unexposed parts, and it should remain unaffected where full exposure has taken place. One might expect the formation of an albumen relief. I have not, however, obtained any results yet that might be of practical importance.

DR. R. ED. LIESEGANG.

### SACCHARINE AS A SENSITISER.

HERR E. VALENTA points out, in the current number of the *Photographische Correspondenz*, that saccharine forms dyes with phenols and amidophenols which are very similar to the phthaline dyes.

Sacchareosine, or saccharine of tetrabromoresorcin, is a brownish-red powder which is not very soluble in water or alcohol, but readily dissolves in alkaline solutions with a carmine-red colour and a greenish-yellow fluorescence; it is very soluble in ether and gives a reddish-yellow solution, with less fluorescence. Its solution has a faint alkaline reaction. The addition of hydrochloric acid turns the red aqueous solution yellow, and the fluorescence disappears; but both the colour and the fluorescence are restored by the addition of ammonia in excess. The dye is quite insoluble in benzole.

For sensitising plates a preliminary bath of—

Water .....	830 c. c.
Alcohol .....	200 „
Ammonia .....	15 „

was used, and the sensitising bath was—

Water .....	800 c. c.
Alcohol .....	200 „
Dye solution (1:500) .....	100 „
Ammonia .....	15 „

This dye gives a vigorous band from D to D  $\frac{3}{4}$  E, with a maximum at D  $\frac{3}{4}$  E.

Saccharine of diethyl-m-amidophenol is a green powder, with metallic lustre, insoluble in water, but easily soluble in alcohol, with a red colour, and has a magnificent blood-red fluorescence; alkalis and ammonia immediately destroy the colour. The dye is insoluble in ether and benzole.

For sensitising no preliminary bath was used and the ammonia was omitted from the sensitising bath, which was otherwise as above.

This dye gave two bands, a narrow one with maximum at D, and a broad but much weaker one with the maximum at D  $\frac{3}{4}$  E.

The acetylated product of the above dye is a greyish-violet powder, greenish metallic lustre, and is soluble in water, alcohol, alkalis, and ammonia, with a violet-red colour, and very brilliant blood-red fluorescence which is most marked in dilute solutions. Hydrochloric acid alters the colour of the aqueous solution, and destroys the fluorescence. It is slightly soluble in ether with reddish-yellow fluorescence, and is insoluble in benzole.

For sensitising, the ammoniacal preliminary bath is used, and the sensitising bath is the same as given above. It gives a vigorous band from C  $\frac{3}{4}$  D, to D  $\frac{1}{4}$  E, with a maximum at C  $\frac{3}{4}$  D, and with long exposure a second weak at D  $\frac{3}{4}$  E.

Sulphurine of diethyl-m-amidophenol is also a violet-brown powder with green metallic reflex, easily soluble in water and alcohol with deep red colour, it has an intense blood-red fluorescence which is more brilliant with an addition of ammonia. Hydrochloric acid destroys the fluorescence. It is soluble in ether with a new red colour, and yellowish red fluorescence, it is insoluble in benzole.

Used, as suggested above, with preliminary bath it gives a vigorous band from C  $\frac{3}{4}$  D, to D  $\frac{1}{4}$  E, with a maximum at D, and a second, weaker and broad band with the maximum at D  $\frac{3}{4}$  E, which, with long exposure, almost fills up the gap to beyond E.

This dye has also the advantage that it is very easily washed out of the gelatine. The saccharine of diethyl-m-amidophenol is readily destroyed by alkalis, and therefore can be easily removed from the film even when concentrated dye solutions are used, if a little ammonia be added to the first wash water.



# PICTORIAL PHOTOGRAPHY: ITS DIFFICULTIES AND PLEASURES.

[Paper read before the Edinburgh Photographic Society.]

AN ancient philosopher hath put it on record that "in the multitude of counsellors there is safety." The pictorial photographer, in applying the proverb to his own case, might well give a new reading and say that "in the multitude of counsellors there is danger." For certainly he has been advised, criticised, and traduced beyond measure, despite the modesty of his pretensions. Art critics, with no knowledge of the difficulties of, or latitude of personal control available in photography pictorially pursued, have assailed him on all sides, and exhausted their vocabulary of abuse in denouncing anything photographic that dared to lay claim to pictorial merit, and, with the confidence born of inexperience, have laid it down that photography is a purely mechanical art, and that at best the photographer is but a "snapper-up of unconsidered trifles." Professors of fine art occasionally address photographers, and, while giving them a kind of qualified praise for their attempts at more artistic results in their works, generally conclude by arguing them out of the delusion that their efforts can ever be of any real artistic merit, and offering the consolatory thought that, though the higher reaches of art are beyond their skill, they may be permitted to do valuable work for the advancement of art in making memorandums for the use of painters. What the pictorial school have had to humbly accept as their due from those outside their own ranks is as nothing compared to what they have been honoured with from within. Their photographic brethren, who see nothing commendable in their work, never tire of reminding them that painters and art critics despise their productions, and curtly sum up the whole matter by giving a recipe for the production of a pictorial photograph which is generally at least commendable for its brevity, if not for its accuracy.

A writer in one of the oldest photographic journals seems to find the whole sweetness of his life in abusing the pictorial school; and his great ambition is to write the epitaph of that school, or don the mantle of Gibbon, and astonish the world with a new "Decline and Fall." Yet, withal, pictorial photography progresses apace.

Much of the adverse criticism passed on the pictorial school is the necessary sequence of any departure from traditional methods, and of what had hitherto been deemed the correct thing; on the other hand, for much of this criticism many photographers who take up the pictorial phase of photography have only themselves to thank. The fatal facility with which one photographer may imitate to a certain degree the work of another is responsible for this. If a leading worker on pictorial lines produces a striking picture, treating some new theme successfully, immediately a host of imitators arise, and, lacking in most cases the power of originality themselves, play with varying success on the same or similar themes till all are wearied with the monotonous repetition.

Another reason for much of this criticism is the want of faith on the part of photographers in the power and possibility of their own art. They seek by diverse methods to give their pictures the appearance of similarity to one or other of the monochrome methods adopted by artists. They seem delighted to be praised for a fancied or genuine resemblance to a wash drawing or mezzotint in their pictures. This weakness is finely hit off in a couplet from one of the weeklies:—

"You may fake, you may vamp up your print, as you will,  
But the trace of the camera lurks in it still."

And why should it not? Photography in some respects is unexcelled by any of the existing methods of picture-making in monochrome; particularly is this so in the rendering of tone values between light and dark. Until the possibilities of photography, as a means of picture-making, have been fully exploited, it is derogatory to the advancement of pictorial work to imitate any other method of monochrome. To do so is to practically accept as correct the limitations which critics would fain shackle upon photography. We are not daring enough in our efforts at picture-making; and, in encouragement of any attempt to venture beyond the bounds of the conventional, we may console ourselves with the thought that what is oftentimes the heresy of to-day becomes the creed of to-morrow.

Passing now to the subject proper of this paper, it seems advisable to remind our critics that there are difficulties to be surmounted in producing a pictorial photograph which are not encountered in the production of what, for want of a better term, we may call the topographical photograph; and, further, that there are powers of personal control available to the pictorial worker which give wide latitude from conception to finish of modifying and improving his pictures.

The photographer who sets out on his pilgrimage in quest of the pictorial has many a Slough of Despond to wade through ere he reaches the goal of success. Unlike the painter, whose whole training is such as to fit him for the work he is to undertake, the pictorial photographer has to begin by unlearning much that was useful to him in the earlier part of his career. All his cherished notions of what was the correct thing in definition, exposure, development, and printing, must be modified and subordinated to the idea he seeks to convey by his picture. A thorough knowledge of technique is absolutely essential, but he must not be its slave, and should rather seek to mould the powers thus given him to serve as an aid to the realisation of his aims. By under-exposure he

may obtain more contrast from a flatly lighted subject; by over-exposure he may modify harsh contrasts; in development he may modify to a great degree for the particular end in view; in printing he has the most control of all, a power which no one who has not tried what can be done in this respect can at all realise.

His knowledge of these principles of art upon which picture-making is based are, more often than otherwise, learned in a perfunctory school, and, when he sets out, say, in landscape work, to put these principles into practice, he is bewildered by the difficulties which beset his path. Unlike the painter, who may choose what he wants, and reject or modify any feature to his taste, the photographer can only select. This is often a difficult problem, and it is only by patient study of his subject, and a full knowledge of what effect the photographic plate will render, that the best effect of lighting and suggestion of the idea sought to be portrayed can be obtained. The glamour of colour often leads him astray, and it is but slowly that he learns successfully to produce in monochrome the effect desired. To get the best effect, the judicious use of isochromatic plates and a yellow screen are of invaluable service in many, if not in all, subjects. Isochromatic plates and a screen help to get over one weakness of photography, the false rendering of light and shade. It seems impossible, in some subjects, particularly where sunshine is sought to be portrayed, to adequately render this effect successfully; and, though shade can be rendered more successfully, it is rarely that we see in a photograph that luminosity of shadow which is always to be seen in nature.

The question of definition, or the amount of detail which may be rendered successfully in a pictorial photograph, is one of the greatest difficulties to contend with. According to the critics, rack the lens out of focus, and it is done. Well, it sounds easy. This is the expression of opinion of those who arrogate to themselves the monopoly of truthfully rendering things as the eye sees them. Has any human eye ever seen a picture, it matters not what it be, as the topographical photograph renders it? The eye is not an inert instrument like a lens, and in looking at any subject is never even for a second at rest, and seems, without any effort of the will, to be moving more or less across the whole field of vision. The eye never sees in nature those hard outlines of the ordinary photograph which have been too readily accepted as an inherent defect of any photographic rendering of a scene. In nature there is always atmosphere present, which softens and subdues what is harsh and inartistic in a photograph pure and simple. Let us for a moment try and recall any scene we may have visited and project on our mental vision a picture of the same, and what do we find? We cannot recall the infinite detail that must have been present, we only remember the features that impressed us. This leads to the conclusion that, even from the point of view of truthfulness, as the eye sees it, excessive detail is an error, and, from the pictorial point of view, the result should approximate to a kind of compromise between the visual and mental impressions. What these critics often forget, too, is that in many subjects treated pictorially detail is almost entirely absent, and notably in atmospheric and evening effects. There occurs to my memory at the moment as an example that fine picture, *Requiem*, by Horsley Hinton, in which detail is almost entirely absent, and to have introduced detail would have been a distinct error. This picture will be familiar to most of you, having been reproduced in the *Amateur Photographer*. Even in subjects well lighted, this absence of detail is not to necessarily mean a fuzzy picture. Softness and breadth is what is aimed at, and it is not easy to obtain such. Personally I have found this desired quality so difficult to obtain with the ordinary type of lenses that, during the past year, most of the work has been done with a set of uncorrected or spectacle lenses. The results are delightful to me, at least. With such lenses soft images are obtained without perceptible blur, just a softening of outline and nothing more. Later on I hope to show you a few results on the screen.

Pictorial landscapes in which figures play a dominant part are so full of difficulties that the average photographer, with his perfunctory training in art principles, may wisely leave them alone. On the other hand, there is a wide field for figure subjects of outdoor life and work which the photographer may attempt with more success. If the landscape be made subsidiary, and the figures the point of interest, many happy subjects may be obtained. Any attempt at posing models found among scenes of rural life and work usually results in failure. Successful effects can be had but by watching and waiting, and it requires a nicety of judgment and alertness of action to decide the right moment for exposure. If the portrayal of motion be aimed at, the difficulties are increased, for the line of demarcation between a blurred image, arrested motion, and a natural action is very narrow.

Thus have a few difficulties in the pursuit of pictorial work been commented upon, and, though the difficulties are many, the pleasures are great.

Once become imbued with the love of and desire to portray nature pictorially, and photography, to the amateur at least, rises to a higher level than that of a purposeless task or the mere pursuit of a hobby. It becomes an abiding source of pleasure, and all seasons may and can furnish us with subjects for pictures. We will, by the necessity of careful observation, be brought into closer touch with nature, and much of her



phenomena which lay unseen before will be revealed to us. Thus we may not only gratify our desire after pictorial rendering of the scenes and subjects which interest and attract us, but in our pursuit find that pictorial photography, followed out on the lines demanded by the end aimed at, may become a source of education and culture as well as an abiding pleasure.

JAMES BURNS.

### PHOTOGRAVURE.

BEFORE the Kingston-on-Thames and District Photographic Society, on January 16, Mr. Horace Wallich lectured on photogravure.

The lecturer, after explaining, with the assistance of lantern illustrations, the various methods of line and half-tone engraving upon copper plates, briefly outlined the process which was the subject of his demonstration that evening. The first step, he said, is the production of a photographic negative of the subject to be reproduced, from which a transparency is printed. From this transparency a negative image is printed on a piece of carbon tissue which is squeegeed down upon a grained copper plate, developed in hot water, and dried, forming the resist. The back and margins of the copper plate are then coated with a protective black varnish, when it is ready to be etched by immersion in baths of perchloride of iron, after which the carbon resist and varnish are removed, and the plate cleaned and polished ready for a proof. Mr. Wallich then proceeded to practically demonstrate this beautiful process, elaborate arrangements for which had been previously made by the lecturer and his assistant, Messrs. W. Drewett & Sons kindly lending a copper-plate press for pulling the prints.

The method of preparing the polished copper plate with a suitable grain was first explained, a slide being exhibited on the screen, showing, on a magnified scale, the characteristic "regular irregular" manner in which the grain is distributed over the surface. The method of obtaining this grain is comparatively simple. In a rectangular box, having a door at its base, is placed a quantity of bitumen powder. By a simple contrivance the powder can be churned up in the air within the box, after which it is allowed to rest for a little while to allow the coarse grains to settle down. The polished copper plate is now inserted in the bottom of the box for about five minutes, during which time the fine particles of bitumen dust suspended in the air gradually fall upon the surface of the plate, which, upon being removed, is heated until the grain is melted, when, upon cooling, it becomes firmly adherent to the copper. A sample plate was passed round, showing the difference between the polished and grained surface. The effect of this grain is to enable the depressions of varying depth occurring in the etched plate to retain the ink which is worked into them in printing. Each little grain protects that point of copper on which it stands from the corrosive action of the etching fluid, so that innumerable little islands are formed, thus breaking up each flat depression into a number of minute hollows, which retain the ink and hand it on to the paper in the printing press.

At this point Mr. Wallich drew the attention of his audience to the fact that, as he was endeavouring to perform in a couple of hours work which should occupy as many days, it was obviously impossible to demonstrate the actual photographing of the picture and the printing of the transparency and carbon negative, but would proceed to squeegee and develop upon the copper plate a previously exposed carbon negative or resist. The tissue used for this purpose is similar to that used in the well-known carbon process, excepting that it is prepared with pigment of a special colour. Development was conducted in the manner common to the carbon process, with the result that a delicate copy of the original negative in relief remained firmly adherent to the grained copper plate. After drying the resist, black varnish is applied to the portions it is desired to protect from the action of the perchloride of iron, and the etching proceeded with. In order that this interesting operation might be the better followed by the spectators, the gas was extinguished, and the light from a limelight lantern concentrated upon the dish. On immersion in the etching fluid, the copper, being unequally protected by the relief resist, is first attacked in those parts where the gelatine is thinnest, forming the deep shadows. Then follow the thicker parts, forming the middle tones, the corrosive action of the solution finally finding its way through the thickest portions of the film, forming the lightest tones, but these are scarcely bitten at all, as the action is at this point interrupted by withdrawal from the solution and washing in cold water. The process occupied eighteen minutes, during which time the methods of preparing and testing the several baths of perchloride of iron by means of an hydrometer were fully explained. The carbon resist and protective varnish were next removed by means of benzole, and, after a thorough cleaning and polishing with precipitated chalk, the plate was handed over by Mr. Wallich to his able lieutenant, Mr. Mulliss, who performed the operation of inking up and pulling a proof on India tint paper in the press.

The plate was laid upon a hot plate, the ink worked all over and into the hollows with a "dabber" of leather by a peculiar rocking motion, the superfluous ink wiped off with coarse canvas, finishing with the palm of the hand, and the margins polished so as to print white. The amount of care that is required at this stage may be understood when it is stated that it takes from a few minutes to half an hour (according to the size of the plate) to do the inking, polishing, and putting through the press of

each copy. It is not quite like running off the copies of a daily paper. It was explained that, after the etching was done, and an "etch proof" pulled, the plate could usually be much improved in the hands of a skilled engraver, some of the engraving tools used being shown. To enable the plate to yield a large edition, its surface is protected by hard electro deposit of iron, technically known as steel facing. As soon as this iron coating showed signs of wear, it could be chemically removed without injuring the copper, and "refaced."

The proof was handed round for inspection, and excited the admiration of all present. An impression was also taken from a retouched plate of the same subject to illustrate the improvement that can be effected by some judicious work on the copper after the plate has been etched.

### THE AFFILIATION OF PHOTOGRAPHIC SOCIETIES.

THE Annual General Meeting of Delegates was held at 12, Hanover-square, London, W., on Friday, January 20, 1899, Mr. W. Thomas (Chairman) presiding.

The Chairman's report for the past year and the Treasurer's balance-sheet were read. The report with certain amendments and the balance-sheet as read were formally adopted, on the proposition of Dr. Baldwin (Rotherham), seconded by Mr. H. Snowden Ward, R.P.S.

The election of officers for the ensuing year was next proceeded with. The appointment of a Chairman in succession to Mr. Thomas (resigned) was eventually deferred until the next meeting. It was agreed that Mr. George Scamell be asked to serve again as the Treasurer of the funds, and Messrs. R. Beckett and A. Mackie were appointed the Auditors of accounts. The services of Colonel Waterhouse, as Honorary Secretary, a matter dealt with in the report, were accepted with acclamation.

It was proposed and seconded that a vote of thanks to the Treasurer and Auditors be recorded, and the same was carried unanimously.

Mr. Mackie, R.P.S., proposed that the thanks of the Committee be conveyed to the Judges of the various competition prints sent in during the past year for adjudication. Mr. Churchill (Woolwich) seconded the motion, which was carried *nem. con.*

It was agreed that a Committee be appointed to co-operate with the Sub-committee of the Council appointed to consider the relations between the two organizations. The following were appointed a Committee for the purpose: R. Beckett (Hackney), J. A. Hodges (Chiswick), E. Dockree (Brixton), J. C. S. Mummery (North Middlesex), C. H. Oakden (South London), A. F. Taylor (Ealing), and the Chairman.

It was arranged that steps be taken to revive the old lectures as occasion offered, and to replace the damaged and broken slides.

The question of the Yorkshire Exhibition was then raised, and, after some discussion, Dr. Baldwin (Rotherham) said he was at the Leeds meeting, when it was arranged that an Exhibition should take place under the auspices of the Yorkshire affiliated societies. How far its carrying out had adhered to this intention he did not wish to say, but the Rotherham Photographic Society, he wished it to be noted, had all its pictures refused. He could not believe that the work was so utterly bad, and he felt that Rotherham had just cause for complaint. As regards the proposed federation in Yorkshire, he was sure Rotherham and South Yorkshire would not join, and, in coming up to this meeting, he thought there should be some expression from the Committee on the conduct of the Exhibition. However, having raised the point, he should be satisfied if Yorkshire were left to fight it out in Yorkshire, and was confident of the result.

Further discussion ensued, and the Chairman traced the history of the movement from its inception at the Leeds meeting of delegates and secretaries through successive stages to the present time.

The correspondence that had passed between the Chairman, the Secretary, and the authorities of the Exhibition in Bradford, covering the whole ground so far as the facts in the possession of the Affiliation were concerned, was then read, from which it clearly appeared that any misunderstandings which had arisen had been entirely cleared away, to the satisfaction of the Yorkshire Committee at the time. Personally, the Chairman would welcome an opportunity of laying the whole matter open to the world, by the publication of this correspondence. It was an agreeable surprise to him, after what he had read and heard, to find, on carefully going through every letter and communication, that there appeared not one single word which he would wish unwritten.

A proposition from the Woodford Photographic Society was read, urging that meetings take place on definite dates to be determined. It was recognised, however, in the discussion that followed, that such an arrangement, which had been tried before, was inconvenient very often for the business to be done, and that the present system was preferable.

The Chairman called attention to the present of a clock which was to be handed to Mr. Child Bayley that evening, and said he had received a telegram from Mr. Bayley, regretting his inability to attend owing to a prior engagement. The Chairman said the Committee was anxious in some way to show its appreciation of his labours as the Secretary, labours which terminated with the close of last year, and it was thought that the Affiliation could best carry this intention into effect, not by individual appeals to the delegates, but as a body by voting as much as reasonably could be spared from the limited funds at their disposal.



He wished to record and express his deep obligations to Mr. Bayley for his many services, in which he knew the Committee desired to join, and he desired that the small, but he hoped sufficiently substantial, offering the Committee was making should be conveyed to him, with the best thanks, kind regards, and hearty good wishes of the Affiliation for him in whatever sphere of life he had to work.

Mr. R. Beckett felt it incumbent upon him to propose in a few words the hearty vote of thanks of this Committee to Mr. Thomas for his services as Chairman, and for the zeal and energy with which he has approached everything touching the welfare of the scheme. He was exceedingly sorry that what he hoped were only rumours had been confirmed, and that Mr. Thomas was withdrawing from their midst. He trusted that rest and change would quickly restore him to health and activity.

Mr. Fry had great pleasure, as one of the newest delegates, in seconding the motion of one of the oldest amongst them, and the vote was carried unanimously, Mr. Thomas briefly replying, and returning thanks for the valuable help which he had always received from the Committee and its individual members.

### "GRAVURA."

An ordinary meeting of the Eastbourne Photographic Society was held on Tuesday, January 17, Mr. Phillips in the chair. The business of the evening, and its chief feature, was the introduction of a new paper for printing by development. Mr. A. C. Baldwin, the representative of the Paget Prize Plate Company, attended, and said that it was about to be placed on the market under the name of "Gravura." The demonstrator briefly reviewed the various kinds of photographic printing papers which were at present used, under the names of carbon, platinotype, bromide, and the newer so-called P.O.P. He said that the course of time seemed to demand that makers of paper should always be looking out for some more or less imaginary photographic "philosopher's stone," in the shape of a paper which, by certain modifications in the treatment, would give anything and everything which the user might desire; and, although they had not perhaps reached that ideal, yet he claimed that in "Gravura" they had a paper which gave in the finished result a very wide range of colour. It was possible, by means of modification of the exposure and corresponding development, to get a rich black or a fine Bartolozzi red, with shades of brown between, simply by alteration of exposure and dilution of a standard developer. Another advantage was that the sensitiveness of the paper was so adjusted that it might be developed by ordinary gas or candle light.

In practice, magnesium ribbon was a convenient illuminant for printing purposes, from 2-inch to 4 inches burned at various distances from 1 foot to 4 feet according to colour required. Mr. Baldwin said that, though everything obtainable from a maker of repute was of good quality, yet his Company claimed in this case to have "gone one better," and met the proverbial "long-felt want" in offering to the photographic world a paper such as he described.

Its practical manipulation was then shown by exposing it under various negatives and varying conditions, producing all the colours mentioned, the reds and browns being especially clear and brilliant.

Several other dried and finished prints had been brought, and were handed to the members present for inspection.

The lecture was listened to with marked attention, none the less, perhaps, because it was delivered in a genial and conversational fashion. At its close Mr. Plomer proposed and Mr. Holloway seconded a well-deserved vote of thanks.

### DEVELOPMENT OF PRINTING-OUT PAPER.

Before the London and Provincial Photographic Association, on January 19, Mr. E. H. Bayston in the chair, Mr. T. E. H. Bullen discoursed on "The Development of Printing-out Paper." He said that he had been primarily induced to take up this particular branch of photographic printing by the fact that urgency had required the completion of certain prints in a time which was insufficient if they were to be done by print-out methods. It was desirable that they should be of the character understood as "photographic" by the general public, that is to say, bromide paper, or other similar development process, pure and simple, would not do, so he was compelled to adopt some other expedient, and that was the development of partially printed P.O.P. prints. The experiments were conducted with papers of all brands, and one thing was noticed, that it was infinitely the better course to buy direct from the factory than from the retail dealers. Staleness seemed to show itself much more when development was resorted to than in the case of printing out, and, whereas excellent results followed the course he advocated, they were indifferent with papers of any degree of staleness. He observed that there was a tendency to strive for the photographic blue tone by direct development, but he was convinced that it was just as impossible to get this tone without the aid of gold by printing out altogether as it was by a development process. Gold was essential for such a tone. Development gave exceedingly good tones, but the photographic blue produced by gold was beyond reach without the aid of gold. Published formulae all seemed to strive for the shortest possible ex-

posure of the paper that would produce a result, but in his own opinion it was necessary to have not only a visible image, but one certainly not less than a quarter or a fifth printed. This would mean that five times the number of prints otherwise possible could be produced in an equal time, which was an excellent power to have. As regards evenness of tone, the rule that holds when printing out, say, a dozen cabinets, namely, to print to the same depth, applies also in development, at any rate from a commercial point of view. Exactly the depth required must be regulated by the same rules which decide the exposure of the plate in the camera, but, above all, expose enough.

Under-exposure yields, by development, a sepia tone, which does not lend itself to after-treatment for the usual photographic tone, but correct exposure gives a red print, which is amenable to subsequent toning processes. Mr. Drinkwater finds that of thirty formulae only three are of practical value. Mr. Bullen thought Mr. Drinkwater himself was to blame for this by the shortness of his exposures and the strength of the developer he advocated. The exposure should be so great that the finished tone of the print, with a weak developer, was red. There was no difficulty in vignetting portraits by the development process, as had been inferred. In looking at the prints during exposure, of course care must be taken to shade the frame, because very little light is wanted to destroy the purity of the whites when development is resorted to.

Cleanliness of hands and utensils is still more important than for printing-out processes, the slightest thing being sufficient to mar the result. The toning of the prints may be done either by combined or separate baths; but, for practical purposes, he preferred the combined baths. As regards the statement that gallic acid, upon which Mr. Bullen's experiments were based, gave green tones, it was a question of exposure and judicious development. Mr. Bullen showed twelve prints of different tints, which were to show the effect of varying the concentration of the developer, and beyond the third there was not the slightest trace of green. All those after the fifth were open to toning to any colour, according to the bath used. Dense negatives are negotiated by the dilution of the developer, and thin negatives by using a stronger solution. The developer referred to is the Gem Meteor P.O.P. developer, and the results, which were shown by Mr. Bullen and Mr. Mayall, were such as spoke very highly of its qualities.

### ON THE PRODUCTION OF WARM TONES ON BROMIDE PAPER.

[Paper read before the West London Photographic Society, January 20, 1899.]

To the amateur, whose hours of daylight are mostly monopolised by work other than photographic, the bromide process is indispensable, and, now that such a large choice as regards surface, texture, and tint of paper is available, bromide printing and enlarging claim and receive the attention of all classes of photographers, from the beginner to the serious picture-maker and exhibitor.

I have always felt, as have hundreds of others, that the only drawback to the process was that its results were in black and white, and only in black and white. The introduction of the hot alum and hypo toning method by the Eastman Company some years ago was a great step in advance, and it emphatically holds the field as the simplest and easiest means of procuring tones ranging from a light sepia to a brownish-purple.

In some quarters the permanence of this process has been questioned; but, whether considered from the standpoint of practical experience or from a purely theoretical point of view, such doubts are quite unfounded. Numberless prints toned in this bath are in existence, and I have not as yet seen one which has undergone the slightest change. The print, in the first place, must be developed up dark, ensuring an image with the maximum of silver deposit, which, in itself, makes for permanence, and in the toning bath this deposit is converted almost, if not entirely, into one of silver sulphide, which is, undoubtedly, the most stable of all the silver salts. Furthermore, some rough experiments I have made lead me to believe that the toned image resists the action of certain destructive agents better than does the original image of metallic silver. Comparisons are made between this process and the sulphuration of gelatin-chloride and albumen prints, but such comparisons rarely go beyond the cry of "sulphur toning." In the case of bromide prints toned in the hypo-alum bath we have a chemical reaction, in which a comparatively permanent image of metallic silver is changed into an image of sulphide of silver of equally great, or possibly greater, stability. In the case of the chloride print we have totally different conditions.

We have a complex reaction between sulphur and a feeble image of various organic salts of silver, which in themselves, without any sulphuration, are generally of a somewhat fleeting character. Setting aside the indefinite organic constitution of the modern chloride image, its lack of depth is its principal weakness, as shown by the much greater permanence of old silver prints which were made in the days when paper was much more heavily salted and silvered than now, and when negatives of much greater contrast were employed.

The toning bath and the method of using it is as follows:—

Hypo.....	10 ounces.
Alum.....	1 ounce.
Water.....	70 ounces.



The hypo is first dissolved, the alum then slowly added, and the solution raised to the boiling point. A new bath frequently acts very slowly and unduly bleaches the prints, and it must therefore be ripened, which is best done by leaving a number of waste prints to soak in it for about a day. The bath must not be filtered, and the best working solution consists of equal parts of old and new bath. The prints may be developed by any developer, although metol is best, and they must be of 'somewhat greater density than usual, as they undergo a slight bleaching in the process of toning; and, in addition to this, the brown image which results is, of course, less opaque than one in black. The action will usually be completed in from fifteen to thirty minutes. The solution is kept at a temperature of from 110° to 120° F. during the process of toning. The prints must, of course, be thoroughly fixed in the first instance, and it is advisable to give them an alum bath before toning. It is best to immerse them in the solution when it is cold, and then raise it gradually to the above temperature, which must not be exceeded, else blisters will probably arise. It has been recommended to transfer the prints from the toning bath to a warm bath of alum, but I prefer to use the alum bath first, and to allow the prints to cool between the toning and final washing operations. Some deposit will probably be found adhering to the surface of the prints, which is removed by sponging with cotton wool, and they should then be well washed.

This bath may also be employed cold, in which case the toning action may take from four to twelve hours for its completion, the time depending upon the condition of the bath. Some method must be adopted to keep the prints separated from each other and entirely submerged. For instance, they may be attached to glass plates by indiarubber bands and supported in a grooved tank, or they may be suspended from corks.

Another method of producing similar tones is to employ a bath of—

Ammonium sulphide (fresh) .....	1 ounce.
Water .....	20 ounces.

This is a slow process, and, on account of the somewhat robust smell evolved, it is best to allow it to work its own sweet will in the back garden. If this process is adopted, it is evident that the fixing and washing must be very thorough, and a final wash will complete the operation.

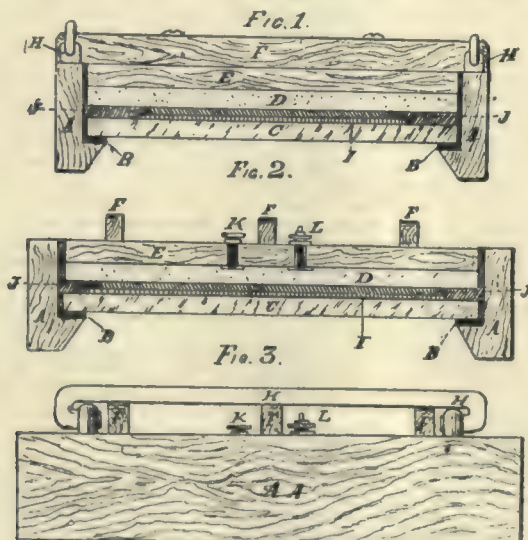
J. BROWN.

(To be continued.)

#### HARRISON'S PRINTING FRAME FOR PROCESS WORK.

MR. HARRISON employs hollow chambers or pads, *d* (fig. 1), of indiarubber surrounded with cloth, canvas, wood, metal, or other suitable material, adapted to withstand the pressure of air or gas introduced and contained within the chambers or pads, *d*, as heretofore mentioned. The said hollow chambers or pads are secured to the lid of printing frame, *x*, or machines, say, with a suitable cement or other efficient means, and is inflated with air or gas under pressure.

He may use, for the purpose of inflating, any ordinary forcing pump



or like device, the air or gas under pressure being introduced to the interior of the hollow chamber or pad, *d*, through a small duct formed in any part of the chamber or pad, as may be found most suitable, and provided with inflating and deflating valves, *x* and *z* (fig. 2).

He further employs indiarubber strip, felt, or any other suitable material, on the rabbet, *b, b*, (fig. 1), which projects on the inside of printing frame, *a* (fig. 1); said indiarubber strip or felt is secured to the rabbet with a suitable cement or other efficient means.

When the rubber strip is fixed to the aforesaid rabbet, a resisting plate of glass, *c* (fig. 1), is laid on the rabbet, *b, b*, and on the plate glass, *c*, a negative, *i*; on the negative, sensitised paper or metal plates, *j, j* (fig. 1).

The hollow chambers or pads are secured to the lid, *x* (fig. 1), and on the lid are fixed battons, *x, x*, and *x, x* (figs. 1 and 3), the ends of battons project one inch or more over the sides of lid, *x*, and chamber, *d*; the lid and chamber are then fitted into the printing frame, *a, a*, and the battons resting on the printing frame, *a, a*, as heretofore mentioned.

Secured in the sides of said printing frame, *a, a*, are two hooked hinged lock bolts, *n, n* (figs. 1 and 3), which are turned upwards over the ends of battons; pressure is then applied.

## Our Editorial Table.

### GRIFFIN'S ACID HYPO FIXING CARTRIDGES.

Manufactured by John J. Griffin & Sons, 20-26, Sardinia-street, Lincoln's Inn-fields, W.C.

AN acid fixing bath is recommended for Velox prints, and Messrs. Griffin here supply the materials for compounding such a bath, consisting of a mixture of alum and hypo in powder and an acid solution in a small vial. Sufficient of the salts are supplied for sixpence to make twenty ounces of solution. The following are the instructions for use, it being noted that the bath is also recommended for bromide papers, dry plates and films:—Dissolve the contents of the box in one pint of ordinary water, then pour into this solution the contents of the small vial, which will be found imbedded in the powder, and the acid hypo fixing bath is ready. This bath keeps for a very long time, especially in well-stoppered bottles. It can be used repeatedly until exhausted. A sure sign of exhaustion of the bath is that the prints or dry plates fixed in it will have a sweetish taste, even after half an hour's washing in water. Furthermore, fixing will become very slow, and prints fixed in an exhausted bath will promptly turn yellow or brown in the whites when exposed to the light after they leave the fixing bath. Keep the prints or dry plates moving in the fixing bath, in order to ensure rapid and uniform fixing.

### PRACTICAL PICTORIAL PHOTOGRAPHY.—PART II.

By A. HORSLEY HINTON. London: Hazell, Watson, & Viney, 1, Creed-lane.

IN the second part of his little work on *Practical Pictorial Photography* the author devotes himself to a development of the theories enunciated in Part I., which was issued last autumn. Perhaps the best way of conveying to the reader an idea of the scope and intention of the present volume is to assign to it the character of an essay on the construction of pictorial photographs. Mr. Hinton, with all the engaging ingenuousness of the professor of leger-de-main, shows you a beautiful trick photograph, and then most conscientiously tells you how it is produced. You take a foreground and a sky, and fit the one to the other. You put in a light here and a shadow there. You block out in one place, "subdue" in another; so on, so on, and hey, presto! there is your pictorial photograph. This being in brief how it is done, can you wonder that Mr. Hinton is finding followers and imitators by the score? The shop boy or mill hand, after digesting a couple of dozen pages of Mr. Hinton's instructions in the manufacture of pictorial photographs, thinks himself as good as his master, and, to judge by what we see on the walls of the exhibitions, very often is. But we mean no offence when we say that one Hinton is quite enough. We can recommend the little book before us to all those who want to study the grammar of Mr. Hinton's characteristic style of photography, and we hope that it will make many of its readers think for themselves, and not become mere slavish imitators of its accomplished author's style of work. By the way, "pictorial photography" is not all landscape work. Is there no such thing as pictorial portraiture?

### A MANUAL OF PHOTOGRAPHY.

By A. BROTHERS, F.R.A.S.

Published by Charles Griffin & Sons, Limited, Exeter-street, Strand.

THIS is the second edition of a work which was originally published in 1892, and the author has seized the opportunity of making some important additions to it, notably as regards colour photography, radiography, and other subjects which have come into prominence during recent years. The book extends to many hundreds of pages, and in wealth of illustrative examples of phototypic reproduction processes is not surpassed by any similar work with which we are acquainted. Indeed, simply regarded as a book for the library, Mr. Brothers and the publishers are to be congratulated on issuing a very handsome and well-printed volume. But it has the far more valuable recommendation of showing on every page the work of a competent hand. Mr. Brothers' practical acquaintance with photography commenced, if we are not mistaken, some forty odd years ago, and has continued ever since, and he is thus perfectly qualified and equipped for his task. He takes the reader practically over the whole ground of his subject, and the result is a



highly informative book, which, if it suffers here and there from the necessities of compression, yet does not leave one in ignorance of any of the numerous essentials of his theme. The historical notes are especially valuable, and the illustrations are instructive, diverse, and well-executed. We can cordially recommend the volume as a worthy addition to any library. It is published at One Guinea.

#### A TREATISE ON PHOTOGRAPHIC OPTICS.

By R. S. COLE, M.A. London: Sampson Low & Co., St. Dunstan's House, Fetter-lane, E.C. Price 6s., 328 pp.

When a second edition of Mr. Cole's admirable work is called for, he will be well advised to subject the passages relating to colour photography, pinhole work, sensitometry, and some other minor sections of the book to careful revision at the hands of somebody having the advantage of a closer acquaintance with those subjects than he appears to possess. The errors into which he has fallen do not, however, call for detailed reference, inasmuch as they fail to intrude themselves into the real scope of the book. The author enters exhaustively into the optics of the photographic lens, and to that class which is qualified to follow him in the formulae and calculations with which his pages bristle this treatise will be simply invaluable. It is the only English book extant that treats in theory of photographic optics, and therefore, as a source of reference for the benefit of those who esteem a photographic objective as a mathematically calculable production, Mr. Cole's able and exhaustive treatise at once steps into a place that has long been vacant.

The book has been compiled for the information of those photographers whom the author assumes to entertain a desire to know the theoretical principles employed in lens construction, but this is a class whose smallness we fear would astonish Mr. Cole. Notwithstanding the dilution of his mathematics, the book appeals rather more to the lens-maker than it does to the lens-user. The late Mr. Traill Taylor, in his handy little book on *The Optics of Photography and Photographic Lenses*, dealt with his subject in a manner that is understood by practical photographers, and shrewdly eschewed formulae and calculations, and the consequence is, that as far as it goes his book has proved highly informative and useful to many a photographer. Monckhoven's *Optics*, too, translated and published thirty-three years ago, may in parts be read with profit and instruction to this day because, like Taylor, the author subordinated theory to practice.

There is still room for a book about lenses, on the lines followed by Monckhoven & Taylor; for it must not be overlooked that in the last thirteen years the wide variety of glasses of differing refractive and dispersive indices placed at the disposal of the optician has resulted in the production of photographic lenses having properties at one time regarded as unattainable. Those properties, as they manifest themselves in practical application, are by no means perfectly understood or appreciated by the users of "new" lenses as they are conveniently termed, so that there still remains an unbeaten track for a competent writer to traverse.

But this digression must not be understood as in any way meant to depreciate the value of Mr. Cole's book, which in its amplitude of detail and prodigality of illustration at once takes rank as a standard work of reference.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, February 1. Chat on Elementary Optics, by Rev. F. C. Lambert.

MR. J. CHROSDALE COULTAS, of Chapel-lane, Headingley, is the new Hon. Secretary of the Leeds Photographic Society, which now meets in rooms at the Philosophical Hall.

McKELLEN, LIMITED.—We understand that the shares offered to the public by Messrs. McKellen, Limited, have been very well subscribed for, and an allotment was made on Tuesday last.

FIRE.—Shortly after nine o'clock on the night of the 20th inst., a fire was found to have broken out in the photographic studio of Mr. Edward Lewis, Les Eaux, Clytha Park, Newport, Mon. The building was entirely destroyed.

The photographic dealing and picture-framing business previously carried on by Messrs. Bidwell & Co., at 36, Midland-road, Bedford, will now be carried on by Bidwell & Brown, to whom all communications, &c., should be addressed.

EASTMAN PHOTOGRAPHIC COMPANY, LIMITED.—The dividend warrants have been posted by the Eastman Photographic Materials Company, Limited, for ten per cent. on both the ordinary and preference shares, making, with the interim dividend already paid, a total dividend at the rate of twenty per cent. per annum for the year ending December 31, 1898.

THE AMER'S ANTIPATHY TO PHOTOGRAPHY.—Miss Lillian Hamilton, M.D., who for three years was physician to the Ameer at Cabul, told an audience the other day that Abdul Rahman has a great antipathy to photography. On one occasion he asked his lady doctor if she could reconcile the possession of her camera with the Scriptural injunction to make to herself neither graven image nor the likeness of anything in heaven or on earth. Miss Hamilton did not say what her answer to this poser was. We wonder if it was "negative."

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION. On Thursday, February 9, at the White Swan, Tudor-street, instead of the members meeting to discuss photographic matters there will be a supper, and Mr. Haddon will take the chair at 7.30 sharp. The Hon. Secretary hopes that a good number of members and friends will meet that evening.

CRIPPLEGATE PHOTOGRAPHIC SOCIETY.—This Society has recently been formed, with its headquarters at the Cripplegate Institute. The annual subscription is 5s., with use of dark room two nights weekly. There is no entrance fee. All those desirous of becoming members are invited to communicate with the Hon. Secretary, Mr. Alfred T. Ward, Cripplegate Institute, Golden-lane, E.C., of whom further particulars can be obtained.

THE Third Annual Dinner of the South London Photographic Society was held at the Montpelier Hotel, Peckham, on Saturday, January 21, when the President (Mr. C. H. Oakden, F.R.P.S.) was supported by about fifty members and visitors. Mr. Child Bayley gave the toast of the Society, which he congratulated on having reached a total membership of 200. The other toasts included "The Press," "The Visitors," and "The Chairman." After the speeches, which were brief, the evening was devoted to an enjoyable smoking concert.

THE CRIPPLEGATE INSTITUTE.—The Governors of this institution, which is situated in Golden-lane, E.C., include among their winter classes one for photography (for men only), which is conducted by Mr. C. W. Coe, of Messrs. M. G. Wood's. A course of seven practical lessons is given in development, printing, and toning, specially arranged for amateurs. All materials and apparatus are supplied free. The fee is 7s. 6d. per course, with no extras. The syllabus is: No. 1, Apparatus and lenses; No. 2, Plates and exposures; No. 3, Development; No. 4, Development (lessons in); No. 5, Printing; No. 6, Toning; No. 7, Negatives, their defects and remedies. The classes are held at seven p.m. on every Friday. Particulars can be obtained at the Institute.

PHOTOGRAPHIC CLUB.—The annual Ladies' Lantern and Musical Entertainment, which took place on Wednesday, January 18, under the direction of Mr. E. A. Newell, was conducted throughout in a highly creditable manner. Mr. F. A. Bridge occupied the chair, and the programme offered an admirable selection of talent, the artistes being Madame Alice Lovenez (soprano), Miss Florence Venning (contralto), Mr. Robert Dennant (baritone), Mr. W. R. Maxwell (tenor), the humourist Mr. Fred Stephens, the shadowgraph genius Mr. Frank Kennard, and Mr. R. B. Hopkins, who energetically wielded the silver bells, Mr. T. F. Noakes accompanying. At intervals lantern slides of a miscellaneous character were thrown upon the screen, and until a late hour the concert-room was crammed with a large and appreciative gathering. The result can only be gratifying to the Club, and especially to Mr. Newell, who had devoted himself very earnestly to the organization and carrying through of this the last, and probably most successful, concert yet given by the Club.

THE CHORUS LADY AND HER PHOTOGRAPHS.—An interesting case relating to the value of photographs came on for hearing, a few days ago, at the Bootle Police Court, when Mr. Vereker, of the *Aladdin* Pantomime, Royal Lancaster Theatre, Bootle, was summoned by Miss Mabel Esmond Cahill, actress and authoress, for unlawfully detaining six photographs, the property of complainant. Mr. Wall, who appeared for the complainant, stated that the photographs represented his client posing in various attitudes, which, when hung outside the theatre in which she was appearing, were calculated to advertise her. The photographs had been delivered to the defendant's agents, and, when they were applied to for them, the complainant could not get them. She was referred from one person to another, and, thinking she was being humbugged, she took out the present summons. The defendant said the complainant was for a time in his employ. He had never asked her for the photographs, as she was only appearing as a chorus lady. It was usual to display the photographs of the leading ladies only. He did not know that the photographs were in the theatre until he received the summons to deliver them up to complainant. As far as he knew, the complainant had never asked for the return of the photographs. The photographs were then produced in Court, and the defendant said it was the first time he had ever seen them. The photographs were then handed to the complainant, and the defendant was ordered to pay the costs.

RE GEORGE ALFRED WOODFIELD, formerly photographer of Week-street, Maidstone.—The public examination of the above-named debtor took place before Mr. Registrar Warner, at the Maidstone Bankruptcy Court on the 18th inst. Replying to questions, the debtor stated that he commenced business as a photographer at 38, Week-street, Maidstone, and subsequently, about five years ago, he removed to larger premises at 105, in the same street. His rent at the former place was 15*l.* per annum, and at the latter place 60*l.* per annum, in addition to rates and taxes. During the epidemic in Maidstone his trade fell off considerably, as the bulk of his customers lived in the country districts, and during the epidemic they kept clear of Maidstone. His wife claimed some of the furniture. He admitted that he had over-estimated the value of his effects, because he valued them as a going concern, instead of what they would fetch under the hammer. He valued his apparatus, &c., at 136*l.*, but his studio, which was worth 40*l.*, went for 4*l.* 6*s.*, and a background that cost him 9*l.* or 10*l.* went for 17*s.* Every creditor would have received 20*s.* in the pound, or 15*s.* in the pound at least, if his landlord had agreed to accept a tenant that witness found. This gentleman would have purchased the business as a going concern, and he would have paid 65*l.* per annum rent, but the landlord asked 85*l.* Afterwards the landlord agreed to accept 75*l.* per annum, but the customer would not pay more than 65*l.* Witness was asking 200*l.* for the business, and he was sure that he could have got 150*l.* for it. That happened about a week before the petition in bankruptcy was filed. The landlord had not yet relet, and the premises were at present empty. He had kept a cash book, but no day book or ledger. He first discovered that he was not progressing satisfactorily about two years ago. In fact, as long ago as 1896, he had a small deficiency. His household expenses had amounted to about 30*s.* per week. His large creditor had been very kind to him, and had assisted him in every way. The examination was ordered to be closed.



## Patent News.

THE following applications for Patents were made between January 9 and January 14, 1899:—

- ANIMATED PHOTOGRAPHY.**—No. 486. "Improvements in Apparatus for Taking and Projecting Animated and other Photographs." R. W. PAUL.
- LANTERN SCREENS.**—No. 481. "Improvements in or relating to Lantern Screens." T. SWINGLER, JUN., and R. HINMAN.
- ARTIFICIAL-LIGHT PHOTOGRAPHY.**—No. 601. "Improved Means for Facilitating the Taking of Photographs by Artificial Light." C. BERNHOEFT.
- ROLLABLE FILMS.**—No. 620. "Improvements in Sensitised Continuous Films for Photographic and Cinematographic Purposes." J. T. SANDELL.
- STEREOSCOPIC CAMERAS.**—No. 675. "Improvements in Stereoscopic Cameras." A. L. GRIMSHAW.
- DARK SLIDES.**—No. 783. "Improvements in or connected with Photographic Dark Slides." J. W. DEBENHAM.
- WASHERS.**—No. 808. "Washer for Photographic or other Prints, Plates, or Films." B. L. HURST and J. McCLURE.
- PHOTOGRAPHIC PROCESSES.**—No. 887. "Improvements in Photography and in Materials and Processes connected therewith." J. E. THORNTON and C. F. S. ROTHWELL.
- CAMERAS.**—No. 895. "Improvements in and relating to Photographic Cameras." G. WISHART and F. MACKENZIE.
- HALF-TONE SCREENS.**—No. 915. "Improvements in Screens or Gratings for the Half-tone Photo-mechanical Engraving Process." H. LYON.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
30.....	Bradford Photo. Society .....	Members' Slides. Criticised by P. E. Newstead.
30.....	Camera Club .....	Photo G. carings. R. Dookree.
30.....	Kingston-on-Thames .....	Subject Competition.—Exhibition of Slides lent by the Royal Photographic Society.
30.....	Richmond .....	Composition and Selection of Subjects in Pictorial Photography. A. Horsley Hinton.
30, 31 .....	Southsea .....	Annual Exhibition.
31.....	Birmingham Photo. Society ..	Fourth Annual Conversazione.
31.....	Hackney .....	Hand Cameras. Jno. H. Gear.
February.		
1.....	Brentford .....	Printing, &c., P.O.P. Mr. Read.—Bro-mide. Platinotype. Messrs. Abbott and Pearce.
1.....	Croydon Camera Club .....	Council Meeting.
1.....	Leeds Camera Club.....	Gum-bichromate Process. W. J. Warren.
1.....	Photographic Club .....	Chat on Elementary Optics. Rev. F. C. Lambert.
1.....	Southsea .....	Annual General Meeting.
1.....	Woodford .....	Exposure and Development. R. Ohild Byley.
2.....	Bolton Mutual Photo. Society ..	Lecture: Amateur Photography.
2.....	Leeds Photo. Society .....	Colour and its Reproduction by Photography. E. J. Wall.
2.....	Leigh .....	Lecture: Practical Points in Exposure, Development, and Printing.
2.....	Liverpool Amateur.....	Demonstration: Enlarging and Exhibition of 1/125 Slides. William Harvey.
2.....	London and Provincial .....	Photographic Society Life. Walter D. Weir.
3.....	Croydon Microscopical .....	Conversational Meeting.
3.....	West London.....	On Hand Cameras. W. Taylor.

### ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 24,—Technical Meeting,—Mr. A. Haddon in the chair.

#### DEVELOPMENT OF GELATINO-CHLORIDE PAPER.

Mr. J. STERRY read a paper on "The Development of Gelatino-chloride Papers, and the Control of the Colour of Resulting Prints," the main object of which was the consideration of the question of the production of prints by development alone without subsequent toning. As far back as 1883 it was shown by Mr. A. Cowan that a very great variety of tone could be obtained in the development of chloride plates, and, if the same could be produced on paper choice could be made to suit the subject in hand, but in this case the difficulties were far greater. In 1892, Herr Valenta described a series of experiments in which, by means of development alone, he obtained sepias, browns, and purples, giving the following as a satisfactory formula: Pyrogallie acid,  $\frac{1}{2}$  per cent.; citric acid, 1 per cent.; sodium sulphite, 2½ per cent. The method appeared to have received some attention at the time, but to have been afterwards almost forgotten. This was followed by Dr. Liesegang, who used a saturated solution of tannin and obtained a red-brown print, but twenty minutes were required for development, and in 1893 Mr. Warnerke and Mr. H. Smith made further contributions to the subject, which then dropped until 1897, when Dr. Liesegang gave the result of a large number of experiments with various developers used

in very dilute neutral or acid solutions, from which he arrived at the conclusion that for practical purposes only gallic acid, hydroquinone, pyrogallol, par-amidophenol, and metol were of importance, the others failing because the paper was so easily stained (THE BRITISH JOURNAL OF PHOTOGRAPHY, 1897, p. 359). Last year, working upon similar lines (*idem*, 1898, p. 714), Mr. W. E. A. Drinkwater found that, with the addition of small quantities of bichromate of potash to a very dilute solution of pyrogallie acid, there was a marked increase in the rapidity of development, and that with suitable proportions a very satisfactory brown colour could be secured, the printing being carried just far enough to show the principal detail clearly. Experimenting with this method, Mr. Sterry at once found it satisfactory, both for colour and rapidity. The amount of bichromate required in the developer was stated roughly at from 1 part in 50,000 to 1 part in 600,000, excess beyond that necessary to develop a print fully in from 1½ to 2 minutes, always leading to a total change in the colour, and also to general fog. A definite quantity of developer, about 2 ounces to a quarter-plate, must be used, or the free silver present would materially affect the print; chromic acid answered as well as bichromate. When a print has been printed right out and fixed, there is a faint image on the paper support after removing the gelatine; but the small amount of exposure necessary for development does not show upon the paper at all, although after development there is a distinct image upon the support. Whilst Mr. Drinkwater's method was largely dependent upon physical development, it was not altogether so, for development could be carried out after washing the print, and, as a preliminary bath for removing all traces of free silver from the print, decomposing any combination of gelatine and silver, and removing fog, the following chemicals proved effective: hydrochloric, hydrobromic, and hydriodic acids, hydrogen peroxide, potassium permanganate, and chromic acid. The lecturer had adopted hydrochloric acid as being the simplest and most suitable for chloride papers, immersing the exposed and washed paper in a two per cent. solution for about a minute after which the print could be developed with almost any developer, although a restrainer was generally necessary to keep back all trace of fog. The colours obtained were most varied, depending upon the exposure, the retarding solution, and the developer; as with chloride plates, short exposures and strong developers gave cold colours, longer exposures and well-restrained developers giving warm tones. Of the two methods brought forward, Mr. Drinkwater's was by far the easier to work, but was practically confined to one or two shades of brown. The principal difficulties in the way of development of gelatino-chloride paper, so as to obtain a variety of colours without toning, were removed by the proposed preliminary bath of hydrochloric acid, but much additional experiment was necessary to fully determine the conditions under which the influence of the support was felt in the general colour. In conclusion, it was pointed out that, unless fairly fresh paper was used, little success was to be expected.

Mr. C. H. BOTHAMLEY remarked that, in using chromic acid, the nature of the water employed was of some importance, because any difference between bichromate of potassium and chromic acid would tend to disappear if the water contained lime salts, which would at once turn the chromic acid into a chromate. With regard to the image on the paper after the removal of the gelatine, he pointed out that ordinary gelatino-chloride paper always contained a certain quantity of soluble silver salts, and that, when the paper was coated, there was practically a plain sensitised paper behind the gelatine emulsion, and consequently upon development there would be an image similar to that which would be obtained on plain sensitised paper under similar conditions. If one was not satisfied with the red colour of some of the examples shown by Mr. Sterry, it was good to know that that was the best colour to submit to subsequent toning.

Mr. CHAPMAN JONES said the graduated prints exhibited by Mr. Sterry showed that different manufacturers succeeded, in different degrees, in avoiding the penetration of the soluble silver into the paper support. He thought the scientific interest of the paper would be greatly increased if it were possible to obtain information as to the exact nature of the papers with which the experiments were made.

Mr. T. E. H. BULLEN said he had made a number of prints very rapidly and successfully by Mr. Warnerke's method of development with gallic acid. With regard to Mr. Drinkwater's process, he did not find that bichromate of potassium answered well; he had not, however, followed the instruction to print for thirty, sixty, or ninety seconds in sunlight, because his experiments absolutely proved that it was impossible to get a developed print which would tone with such short exposures. Each paper, and each batch of paper, required different treatment.

The Rev. F. C. LAMBERT asked whether Mr. Sterry could tell him how to get pure black-and-white prints on P.O.P. by development alone.

Mr. BOTHAMLEY remarked that the gallic process, used by engineers for the reproduction of plans and drawings, gave excellent black-and-white prints, and was worthy of more attention than it received.

Mr. STERRY said he did not know how to get pure black-and-white on gelatino-chloride paper, the tendency to green in the blacks being apparently insuperable.

#### PERSULPHATE OF AMMONIUM AS A REDUCER.

Mr. ERNEST MARRIAGE showed a few slides to illustrate the action of persulphate of ammonium in the reduction of excessive density. The slides had been treated (generally when dry) in a five per cent. solution of persulphate, and the shadow detail had been well brought out without loss of detail in the high lights, the colour being changed from red to grey. The time of immersion varied from ten to fifteen minutes.

Mr. BOTHAMLEY said he had made a few experiments with persulphate and found it an exceedingly valuable reducing agent; he tried it with some under-exposed and practically useless negatives of interiors, and was a good deal surprised at the way in which it tended to wipe out the dense parts of the image while scarcely touching the fine detail. The exact strength of the solution did not much matter, as long as it was not over five per cent.; as it slowly decomposed in solution, it was advisable not to make up more than would be used within a short time.

The thanks of the Society were accorded to Mr. Sterry and Mr. Marriage.



**Croydon Camera Club.**—Australia has ever been known as of anomaly land, hence the strange and peculiar fauna depicted by Mr. W. Saville Kent at the above on Wednesday, January 18, and the often curious habits and customs described were full of matter for remark and wonderment. How the Southern bear sleeps, hunched on to a nearly perpendicular branch, how the Southern bird builds a nest thirty or forty feet in diameter, and how the Southern ants put up tenement houses for themselves twenty feet high, are just one or two samples of the kind of curiosities of animal life shown. Perhaps the most remarkable of the many natural-history specimens dwelt upon were the lizards. Thus the extraordinary thorny lizard, the bearded one, and another fearsome little specimen which, when approached by any threatening animal, opens a kind of reptilian umbrella and makes such a face that the boldest sporting dog quails and turns tail, were vastly appreciated. The chameleons—though not Australian—shown fly catching were also distinctly good, as were some snapshots of sprinting lizards, which stand up on their two hind legs and run twenty or thirty yards at a stretch. Can it possibly be that these little fellows are trying to evolve into a new type of man? If so, even the new woman will, later on, have to take a back seat. Fish which seemed like the creation of feverish nightmares, wonderful acres of coral reef, and many other captivating photographs were also shown by the lecturer, who was not only followed with much attention by a large audience, but received an enthusiastic vote of thanks at the instigation of the President (Mr. Hector Maclean).

**Hackney Photographic Society.**—January 17, Mr. W. Rawlings presiding.—The Excursion Secretary announced the result of the excursion lantern-slide competition, of which Mr. C. H. Oakden had acted as Judge, as follows: 1st, Mr. W. Selfe; 2nd, Mr. F. W. Gosling; 3rd, Mr. J. E. Hull. Mr. Gear demonstrated the method of

**DEVELOPING NEGATIVES WITHOUT A DARK ROOM,** which had been introduced by Mr. Howard Farmer. This consisted of adding to the developer a certain deep orange-coloured solution, which acted as a light-filter, and allowed a negative to be developed in the light of an ordinary room. This process would be a great convenience for testing exposures when away from home, and where, perhaps, no dark room was obtainable. To show that this method of development was applicable even with the use of energetic developers, Mr. Gear developed at the meeting two negatives with a strong solution of rodinal plus the colouring solution. The plates were developed in the full light of the meeting room, and when finished showed no signs of fogging. The coloring matter had no effect on the developer beyond staining it, and the trace of colour remaining in the film after fixation was quickly removed in the after-process of washing.

**West London Photographic Society.**—January 20, Mr. H. Selby (President) in the chair.—Mr. James Brown (Hon. Secretary) read a paper on

**THE PRODUCTION OF WARM TONES IN BROMIDE PAINTS.** [See page 57.] The hot alum and hypo process was demonstrated, and a number of enlargements toned by that method, kindly lent by the Eastman Company, were exhibited. Toning methods, in which the print is bleached and subsequently redeveloped were fully described, and numerous prints so treated were shown.

**Birmingham Photographic Society.**—January 17, Annual General Meeting.—Sir J. B. Stone, M.P., who has been President for six years, took the chair in that capacity for the last time. In moving the adoption of the report Sir Benjamin said photography had been applied to scientific and educational uses, and to a variety of forms of pleasure and enjoyment. They had seen in recent years the growth of the photographic taste and the camera in evidence in every possible quarter; but, with all the possibilities of the art, he did not think sufficient progress had been made to justify the energy and expenditure that were constantly going on in photographic materials. His parting advice to the members of the Society was that they should take the opportunity at their annual Exhibition of putting before the world the various uses to which photography can be applied, and the members might emulate each other in producing a series of scientific slides or pictures that might answer either for a public lecture or for instruction in the elementary schools. There was such a vast field still open for photographic work that he could not conceive they had exhausted their operation as leaders of public opinion. As a Birmingham Society they were proud of the Warwickshire Survey, and he was gratified beyond measure that this survey work had spread far and wide, and was being done in an excellent way throughout the country; and, whilst he had always been a strong advocate of record work, he had never had any selfish notion that the work should be confined to a particular collection or a particular locality, but, when he advocated that they might send interesting records to the British Museum, he did not withdraw his first love for doing it for their own locality first. The reasons for making photographic records increased, to his mind, the more he studied them. In past times waves of destruction had passed across this country, which had done much harm to us as a civilised nation, and they could not measure the incalculable loss, the destruction of ancient monasteries, and abbeys, and ecclesiastical memorials had been to us. In the reign of Edward VI., for instance, an act was passed to destroy and absolutely do away with all graven images and books, and that act was carried out by the public to such an extent as practically to destroy all valuable ecclesiastical work that had been erected up to that time. Greyfriars Church was filled with magnificent work of architecture and design, monuments erected to great men, but not only did the people enter the church and deface the monuments, but they were sold to an eminent alderman of the day for 50*l.*, who broke them up for road metal. How valuable would have been photographic records of the beauties of these monuments. The men of those days, he reminded them, were as cultured, as eminent, as skilful, and as thoughtful as those of the present day, and they were not to think that, because they lived in the nineteenth century, such things could not happen again. He urged them strongly to continue the work in which they had taken such an excellent lead. Mr. J. F. Hall-Edwards seconded the motion. He emphasised the importance of the scientific side of photography, and added that he would like to see a school of photography established in Birmingham. He hoped this would be one of the first movements in connexion with the Birmingham University—a university, by the

way, which was being founded on lines with which he did not altogether agree. Such a school was very badly wanted. The report was adopted. The following officers were elected:—*President:* Professor F. J. Allen (Mason College).—*Vice-Presidents:* G. F. Lyndon, J.P.; J. F. Hall-Edwards; T. W. Robinson, and E. Underwood.—*Treasurer:* Richard Haines, M.A.—*Hon. Secretary:* C. J. Fowler.

**Bradford Photographic Society.**—This organization held its Annual Meeting at the Bradford Grammar School on Monday, January 16, the President (Mr. Alex. Keighley) in the chair. There was a fair attendance. Mr. KEIGHLEY opened with a few remarks about the Society and its welfare. It had been in existence, he said, just four years, and during that period many interesting lectures and meetings had been held. He felt certain that the Society had been of great use to photographers by providing them with a means of seeing the work of others and exchanging opinions; but, had it achieved no other work than the Yorkshire Photographic Exhibition, he considered it had established a right to exist. The Exhibition had not, of course, been entirely the work of the Bradford Photographic Society, still the larger share of the work and organization had been accomplished by its members. The SECRETARY (Mr. J. Snowden) read the annual report, which showed that the Society was in a flourishing condition. The TREASURER (Mr. F. Nicholson) brought forward the balance-sheet, which showed a small amount to the credit of the Society. The following new officers were then elected:—*President:* Mr. Percy Lund.—*Vice-Presidents:* Messrs. Alex. Keighley, F.R.P.S., F. J. R. Sutcliffe, R. J. Appleton, W. Halstead, Frank Nicholson, and Oliver Nicholson.—*Committee:* Messrs. Rogerson, Liebrich, Geo. Thistlethwaite, W. A. Tetley, Wainwright, Kelsall, A. Hewitt, J. W. Bateson, and A. Hampshire.—*Hon. Lanternists:* Messrs. L. Cooper and C. W. Maw.—*Hon. Librarians:* Messrs. H. Akam and A. Hewitt.—*Hon. Treasurer:* Dr. David Stephenson.—*Hon. Recording Secretary:* Mr. F. Woodall.—*Hon. Business Secretary:* Mr. Ezra Clough. After the election Mr. PERCY LUND proposed that a very cordial vote of thanks should be given to Mr. Keighley, the retiring President, for his excellent services during the past four years. Mr. Keighley was one of the most prominent amateur photographers of Yorkshire, and he had done much, both in the Club and out of it, to encourage an interest in photography as an art. He hoped that, although Mr. Keighley was vacating the presidential chair, he would not lose interest in the Society, but would still, in spite of living at some distance from Bradford, be present at many of the meetings. Mr. GEO. THISTLETHWAITE seconded the proposal, which was carried with acclamation. An excellent series of lectures and demonstrations had been arranged for the remaining half of the season. Those interested in any branch of photography, whether ladies or gentlemen, are cordially invited to become members. The meetings are held every Monday evening at the Grammar School at eight o'clock.

JANUARY 23.—Mr. P. R. SALMON gave a lecture, entitled

#### PALESTINE AS I SAW IT,

illustrated by 150 slides. Mr. Percy Lund presided. The Chairman said they were all pleased to welcome the lecturer, an old member and friend of the Society, who needed no introduction. He was pleased to see such a large attendance and to have such a long list of new members to propose for election. He invited any one interested in photography, whether ladies or gentlemen, to join the Society, which he was pleased to say was in a very flourishing condition. Mr. Salmon, who is in the employ of Messrs. Levy et ses Fils, Paris, in commencing his lecture, stated that some of the slides were taken with a stereoscopic camera and others with a hand camera. The slides which were made by the special albumen process, for which his firm is so noted, were of excellent technical quality and great pictorial merit. Some of the principal views were of Jerusalem, including the Mosque of Omar and the Mosque El Akse, Bethany, Bethlehem, Mar Saba, Ain Karim, Nazareth, Shiloth, Nablous, Sidon, Acre, Tiberias, Magdala, and Damascus.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### PLATINOTYPE PRINTING.

To the Editors.

GENTLEMEN,—I notice that several of your readers have made inquiries as to the cause of certain peculiar lines and mealiness in platinum prints.

I myself have been so troubled, but have got a remedy at last, though what the cause is I cannot say.

To those using Platinotype Company's paper I recommend the following developer and conditions:—

Neutral oxalate.....	12 ounces.
Weak hydrochloric (3 ounces to 80 ounces of water).....	20 "
Make up with water to.....	80 "

Heat developer when using to about 70°, even hotter can be used.

The negatives should be plucky for this formula.

Your readers may think this is for hot-bath paper, but I have used it as given here on the A A paper for some time.

I should be glad to know from any who try this what success they meet with.—I am yours, &c.,

ALFRED E. BUTLER.

Ormonde Villa, Warleigh-road, Brighton, January 28, 1899.



## To the Editors.

GENTLEMEN,—Relative to meanness in prints, if "C. O. & D." does what he says he does, i.e., "pass my prints through the solution in the usual way," the meanness is accounted for. It is not advisable to save time by developing platinotype prints from the back as well as the front, and they should be merely floated, face downward, on to the surface of the developer, keeping the back of the prints dry, at least until the front is quite wet. The print may be at once picked up and held in the hands until development is complete. All this is "the usual way," but some people always know better than to follow the maker's printed instructions, and then grumble (because they get into messes inexplicable) to said makers and to every one else. Of course, "C. O. & D." may not be one of these.—I am, yours, &c.,

T. H. M.

## To the Editors.

GENTLEMEN,—I notice that three of your correspondents seem to be in some difficulty with their platinum prints, although, personally, I have been very successful with them. I think some discussion on this subject would benefit printers generally. According to C. O. & D. he has apparently used oxalate only. I think, if he used biphosphate of potash (perhaps this is not so widely known as it should be), he would be pleased with the result. I know from experience it is far better; if he added three-quarters of a pound of the biphosphate to his stated formulae, he would find his troubles disappear. I think it quite possible that he may be slightly over-printing, and stopping development directly the image appears, and thus causing the mealy appearance. If he accurately follows up the Company's instructions, he cannot fail to get good results. I think the secret of platinotypes lies in the depth to which the printing is carried; that is everything, and it is only gained by careful practice. I have used the Company's paper for the past two years, and never found it at fault. "Printer" is troubled with lines running through the print; I have seen a few of them and believe it to be something to do with his padding, as he says the lines appear before the print is half off the negative; this is how I have found it. Platinotype printers must remember that damp renders the paper useless, that they must be printed the right depth; it, of course, varies with the quality of the negative, and the temperature for the cold-bath developer should not be below 80°. I have found the D. salts superior to the ordinary oxalate developers.—I am, yours, &c.,

H. J. HEWITT.

1 Sycamore-terrace, Bootham, York, January 20, 1899.

## To the Editors.

GENTLEMEN,—Re platinotype printing troubles. My advice is, Order all required in hot bath (A) of the Platinotype Company. Judging from my own experience, all the troubles complained of will vanish.—I am, yours, &c.

ONE WHO HAS BEEN THROUGH THE MILL HIMSELF.

## MODERN FALLACIES, &amp;c.

## To the Editors.

GENTLEMEN,—I sympathise with your desire for strict accuracy, hence it is that whatever I write in the photographic and other technical press is the result of honest personal study and experience. I find it difficult to understand, therefore, why I am specially selected for the pillory.

Premising that I am not so ignorant as you appear to infer of the composition and properties of sel-d'or (nor the manner and purpose of its introduction), I should like to point out that, although the writer of the article in question has quoted me correctly, he has not attached the significance to the word "combined" that I did.

I imagine that, when M. Fizeau, to whom we are indebted for the introduction of the double salt of gold and soda, "sel-d'or," that is, called attention to its properties, the bath was made up by those who used it on the spot by mixing solutions of gold chloride and soda hyposulphite. Later on would come the tubes of sel-d'or, but many would still make it in the old way. It is easy to see that from the simple solution to one containing phosphate of soda and an excess of hypo, with the object of combining the operations, was only a step; that, as a matter of fact, the old combined bath, which figures in all old ALMANACS OF THE BRITISH JOURNAL OF PHOTOGRAPHY, is all that remains to us of the old hyposulphite of gold and soda toning bath. It was very frequently mentioned by old photographers, as I can very readily remember, as a hyposulphite toning and fixing bath, not to be recommended, however, on account, so they said, of the non-permanence of the results without an after bath of hypo, and some openly referred to it as a "sel-d'or" bath, and I am quite sure that it was a sel-d'or bath, "inasmuch as it contained a solution of gold and soda hyposulphite" "combined" with other salts.

There is no doubt, as you say, that "sel-d'or," a rather elastic term by the way, was the name given to the double salt of gold and soda introduced by M. Fizeau for the purpose of toning Daguerreotypes; but, so long as we use chloride of gold and hypo soda in a combined toning and fixing bath, we cannot forget the "salt of gold." Some people would

say that to nothing else are we so much indebted for all the faded silver prints of the years gone by. I am not anxious, of course, to defend the bath in any way; it was useful for wet-collodion slides, but prints very often displayed signs of sulphur toning.—I am, yours, &c., J. PIKE.  
Nottingham.

## THE ROYAL PHOTOGRAPHIC SOCIETY AND PROFESSIONAL PHOTOGRAPHERS.

## To the Editors.

GENTLEMEN,—As a "bread-and-butter man" I venture to write you about the R.P.S. election, the third Yorkshireman who has done so. That the R.P.S. has made mistakes in the past is admitted. Sometimes those mistakes have been made while trying to improve things. Few professionals exhibit now at the R.P.S. or anywhere else. Why? Because most of those who used to exhibit have found the game not worth the candle. Only the other day, the R.P.S., or as it was then the P.S.G.B., saw that retouching and touching up was being carried on to such an extent that the Judges at the annual examination were bothered to know which was photograph and which was paint; so they decided to encourage the exhibition of pure, that is untouched, work, as, after all, the Judges were men who knew more of photography than of painting and retouching, and to this end refused to honour any photograph, no matter how good, which showed signs of hand work on negative or print. The result was that very many of the best professional exhibitors took offence and showed no more. Not that I think the Society was wrong in putting down retouching, but I am in the minority here.

Then the R.P.S. made a mistake more recently, it began to create Fellows of the R.P.S., but was not particular what the Fellow knew of photography as long as he had two guineas in his pocket. When this honour was offered to us bread-and-butter men for a certain sum of money, we felt astonished, for the average Englishman has a sense of honour left in him, and there are certain things which he thinks should not be bought with a price, but won by hard work; and then two guineas is two guineas. Now, when we saw how certain photographers bought this honour and advertised the purchase in large gilt letters on the front of their mounts, underneath work nine-tenths of us would have been ashamed to send out, we felt more sorry than ever for the R.P.S. In fact, if a Fellow of the Royal College of Surgeons had made such a bad job of a patient as one portrait I saw lately, signed F.R.P.S., I am sure the Fellow would have been asked to resign.

There are some points in Mr. Percy Lund's letter which I think require comment. May I comment? Mr. Lund is sorry that professionals will not unite. They never will. Why? Because their ranks are continually being recruited by men who are bound by no laws or traditions. Twenty years ago—before the deluge—with the amateur such a thing might have been possible, to-day it is not. Supposing all the photographers here unanimously decided to give only two instead of three cabinets for half-a-crown, to-morrow there would be a new studio with an amateur in it doing them at the old rates.

Look at the National Association of Professional Photographers! This body found it impossible to make photographers unite, they could not even agree about the most suitable meeting places; some were thirsty, and others thought all distillers and brewers should be potted at sight.

The last paragraph but one in Mr. Lund's letter is the one I find it hard not to agree with. If I am not mistaken, the "others" have been going to the wall, according to certain writers, for years; but it does not require much observation to find that it is this class of photographers who is doing, and has done, most of the trade. For one person who is an artist and has cultivated taste there are thousands who never bother their heads with the fitness of things. To be sure, photographic dealers are greatly to blame for pressing on to photographers in the good old days impossible and abominable accessories and backgrounds, for much of the bad taste which abounds, which our patrons seem to think necessary to make up a perfect photograph, and unless we can provide an artificial palm tree, a sham terrace wall, a stuffed poodle dog, and a castellated mansion behind, people go where such things are to be had. They would rather suffer the torture of the head-rest, and be twisted into ridiculous attitudes, and be highly polished by the retoucher, than be taken naturally, and say that they never enjoyed sitting for a portrait before. When I was young, I hoped as Mr. Lund hopes yet, but hope deferred makes the heart grow sick. Excuse all this.—I am, yours, &c.,

Whitby, Yorks, January 20, 1899.

FRANK M. SUTCLIFFE.

## THE CROYDON CAMERA CLUB AND THE AFFILIATION.

## To the Editors.

GENTLEMEN,—Currency having been given to unfavourable and *ex-parte* statements which seek, by making damaging reflections upon the Club and myself, to minimise the effect of the Club's resignation of membership in the Affiliation, I ask you to give us the privilege of explaining in your widely-read JOURNAL how it happened that the Club revolted.

The combination of societies for mutual help and encouragement was,



no doubt, at the outset a very fascinating idea, full of valuable possibilities.

What has this alluring project developed into? Nothing much beyond sterility and destruction. Almost from the very beginning the Affiliation has been notoriously captured and run by a log-rolling gang, which, regardless of outsiders, has played for its own hand. Let me cite some amongst the least objectionable instances.

Take the *Judges' Regulations*. Here, instead of the main object in view being to aid and safeguard the interests of the affiliated societies, the controlling gang drew up a set of rules almost solely in the interest of what are called "Judges" and of exhibitors. All kinds of vexatious restrictions and obligations have been thereby imposed upon societies by this precious one-sided document, which it is not surprising to know has more than once been contemptuously passed over by those who possess a spark of independence.

Another impertinent inference, by the photographic equivalent of "The Three Tailors of Tooley-street," was made on behalf of certain amateurs who want to have money forced upon them for unsaleable lantern lectures. This tampering with freedom of contract, so far from being helpful, is most distinctly detrimental to the activity and welfare of photographic societies. In connexion with this point it is somewhat surprising to find that, as regards compulsory payment for lantern lectures, the Royal Photographic Society, which is the parent of the Affiliation, does not even pay "the expenses" of all those who give lantern lectures at its exhibitions, this notwithstanding that it is guilty of taking "money for admission."

Amongst other things which have riled the Club was the cynical way in which the Affiliation filched the credit derivable from a first communication of Mr. James Packham's notable researches on *gum-bichromate printing* to the Croydon Camera Club.

A paragraph in a contemporary also reminds me of the high-handed way in which the Affiliation, several years ago, took advantage of the carelessness of our then Secretary, when, in consequence of our subscription being a few weeks or so overdue, the Club was actually struck off!

This general policy on the part of the Affiliation of being as harmful and ill-tempered as possible has certainly tired out our patience. Even to the very last the Affiliation, so far from welcoming help in return for offers of aid, flings back mud. The assertion which has been made is, however, not true that I have been canvassing (*i.e.*, soliciting votes) for an Affiliation lecture. The real facts of the matter are that, reading that lectures on certain subjects were desired for circulation, I informed the Chairman that I should be pleased, if called on, to furnish one on a particular subject with which I am familiar. On his replying that the initiative rested entirely with the delegates to nominate and invite lecturers, the matter, as far as I am concerned, dropped, and I took no further steps. I was not even aware that any one but Mr. Thomas and myself knew of my offer. I suppose, in the ordinary course of business, at some meeting, the subject cropped up, and my offer thereby became known to some of the delegates, who, however, could make no better use of it than to inspire spiteful comments.

By the way, had Mr. Thomas continued the chairmanship, it is quite possible that the Club would have gone on putting up with the unpleasant ways of the Affiliation out of regard which many of our members have for the late Chairman. As it is, we sorrowfully resign the inestimable privilege of half-price exhibition tickets; and, as our members prefer to take their sleep in bed, also forego the Affiliation circulating lectures.

Other societies may find it worth while to swathe themselves in Affiliation red-tape, and feed off the photographic pap sent out, but we of Croydon prefer more freedom, and stronger, fresher meat; and so we intend to "gang our own gait," indifferent whether or not we thereby provoke another "severe indictment of the management of the Society," being quite content with our continuous growth, our financial prosperity, and with the abnormal interest taken in our meetings by the general body of members.

I should add that I took no part in the discussion at our Council meeting which decided the resignation, I was utterly unaware the question was going to be raised, and that not a voice was lifted up in favour of the Affiliation.—I am, yours, &c.,  
HECTOR MACLEAN.  
Croydon, January 24, 1899.

## THE METRIC SYSTEM.

To the Editors.

GENTLEMEN,—I have had the gratification of reading the notes on the metric system published in your issue of the 13th inst., and note with thanks your suggestion that I should send to Professor Sweet a copy of the report recently issued by this Association.

It will probably interest you to learn that there exists in the United States a society which advocates the adoption of the metric system. The President of it is Professor Mendenhall of Worcester, Mass., the writer of the accompanying pamphlet, and I am to-day writing to that gentleman, calling his attention to Professor Sweet's remarks.

I think Professor Sweet is wrong when he says the manufacturers are against the metric system. I spent twelve months in the States in 1897-8, and I found several manufacturers, or makers of machinery, who

were in favour of it; indeed, I found some who use it in their works, and I believe I could soon obtain a list of seventy firms who do so use it. They see that, if they are to send their machines to metric-using countries, they must do so.

Further, a Bill for the compulsory introduction of the system into the United States on January 1, 1901, is before Congress now, and I received a letter from the Chairman of the Committee on Coinage, Weights and Measures, at Washington, only a fortnight since, saying this Bill was very likely to pass. The fact that the Americans use the metric system in Cuba, Port Rico, and the Philippines, is helping to bring that result about.—I am, yours, &c.  
E. JOHNSON, Secretary.

The Decimal Association, Botolph House, Eastcheap, London, E.C.,  
January 20, 1899.

[The pamphlet by Professor T. C. Mendenhall, which Mr. Johnson is good enough to send us, is an able defence of the metric system in reply to some criticisms directed against it a few years ago in the *Times* by Mr. Herbert Spencer.—Eds.]

## 1899. FORTHCOMING EXHIBITIONS.

- January 27-31..... Perthshire Society of Natural Science. C. F. S. Burrows, Hon. Secretary, 16, Princes-street, Perth.  
,, 30, 31..... Southsea Amateur. F. J. Mortimer, Cornwall House, Ordnance-row, Portsea.  
February 4-25..... Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, 2, George-street, Edinburgh.  
,, 13-18..... Photographic Society of Ireland. Hon. Secretary, 35, Dawson-street, Dublin.  
,, 21-24..... Hastings and St. Leonards. Exhibition Secretary, A. Brooker, 21A, Wellington-place, Hastings.  
,, 23-25..... Woolwich Photographic Society. Hon. Secretary, F. W. Machen, 161, Griffin-road, Plumstead, S.E.  
,, 27-March 4. Birmingham. C. J. Fowler, Court Mount, Edington, near Birmingham.  
March 4-11 ..... South London. Hon. Secretary, A. E. Allen, 27, Princes-square, Kennington Cross, S.E.

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

J. Clapperton, 23, Albert-place, Galashiels, N.B.—Photograph of Dr. Wm. H. Murray, of Galashiels.

J. A. Horsburgh, 4, West Maitland-street, Edinburgh.—Photograph of The Right Hon. Lord Saltoun, of Philorth, Aberdeenshire, as Grand Master Mason of Scotland in Masonic dress.

D. K.—You have omitted your name and address; consequently, according to our rules, your question is not answered.

F. BEECH WILLIAMS.—Register the photograph forthwith and place the matter in the hands of a respectable solicitor. You will then have no difficulty about recovering.

ROBERT ROBY.—1. We should certainly recommend colour-corrected plates and a screen. 2. The Bausch and Lomb Ray-filter. 3 and 4. Edwards's Snap-shot Iso.

J. A. H.—1. Platinotype paper is usually meant, although the letters are occasionally employed to indicate collodio-chloride. 2. The papers named are *gelatino-chloride*.

J. D. G.—The Strand Engraving Company, Strand, W.C., would undertake the work. The price ranges from 6d. to 1s. 3d. per inch. You would probably be charged about 8d.

JOHN RELPH.—1. There are several solvents of celluloid which would answer your purpose; probably acetate of amyl would do best. 2. We know of no special preparation for the purpose.

X. Y. Z.—Your communication is far too personal, and too offensive for admission into our columns, even if your name, as the writer, were attached to it. Even that you have not the courage to do, it seems.

MOUNTANT.—H. GRIFFIN. Nothing beats freshly made starch paste as an all-round mountant. The mountant named is a convenient one to use, but as it is a trade preparation, and we do not know its composition, we can express no opinion as to the effect it may have on prints mounted with it one way or other.

LANTERN.—C. A. CROSS. The unevenly lighted and partially coloured disc on the screen shows that the light is not properly centered, and is not at the right distance from the condenser. First see that the light is accurately centered with regard to the axis of the optical system of lantern, then move it backward and forward till an evenly illuminated disc is obtained.



**FLASHLIGHT.**—T. LAMBERT. The composition referred to will give an excellent artistic light, and of very short duration. The "flash" is very much of a small explosion, and we should advise you to be very careful with the mixture, for fear of accidents. Better keep the ingredients separate, and then mix only just before using, employing only a strip of cardboard for the mixing. It is one of the most dangerous of the flashlight compositions.

**BURNISHER.**—WRECKED says: "My Globe enameller marks my prints in several places through minute digs in it; will you oblige in your answer to Correspondents? 1. Is there a remedy? 2. Can I get a new bar and where shall I write for it? Thanking you in anticipation."—1. If the "digs" are not too deep, they can be worked out on an oil-stone—working the bar longitudinally along the stone. 2. Those who supplied the burnisher will, doubtless, supply a new bar.

**PHOTOGRAPHIC CLUB.**—C. X. There is no difficulty whatever in gaining admission to the Photographic Club either as a member or a visitor. As the former, you have only to be proposed by a member and seconded by another. As a visitor, you will be admitted by the introduction of any of the members, or the Hon. Secretary will be pleased to send you a ticket of admission to any meeting on application. Address, W. R. Stretton, Esq., 4, Queen-street-place, E.C.

**TENANCY.**—WARWICK. As you took the tenancy on a three years' agreement and no fresh one was made, it seems to us that you have since been a yearly tenant, and subject to the six months' notice you received at Christmas. Unless there was an agreement to that effect, you cannot claim any compensation with regard to the studio you built. Surely you did not build a studio and other premises on the strength of a three-years' agreement? If you did, it was very remiss on your part.

**WINTER PHOTOGRAPHY.**—J. FROST facetiously writes: "I was much interested in your valuable hints re winter photography, and how to turn it to profitable account. It would be equally as interesting and valuable if you would tell us when we shall have a winter when we can make use of them, which I certainly shall when the opportunity occurs!"—We are afraid we must refer our facetious correspondent to the Clerk of the Weather for a reply, as it is "beyond our ken."

**CINEMATOGRAPH.**—1. Impossible to answer satisfactorily. We have seen films that have been passed through the machine hundreds of times and yet have remained in good condition. No definite guide can be given—all depends upon the care and skill of those through whose hands the films pass. 2. The subject is fully discussed in a useful little book, *Animated Photography*, by C. M. Hepworth, published by Hazell, Watson, & Viney, 1, Creed-lane, E.C., price 1s. We recommend you to procure this.

**TONING BATH.**—G. HORNE asks: "Can you, through your valuable paper, give me a formula of a thoroughly reliable toning and fixing bath combined, one that will keep for retail purposes? We should require three or four gallons at a time. It must be one solution, as the amateur likes that best. Thanking you in anticipation."—We know of no reliable combined toning and fixing bath that will keep, because in time the gold would become reduced, and, after that, what tones were obtained would be due to sulphur toning and not gold toning.

**STUDIO.**—J. M. writes: "I purpose building a new studio 30 feet by 19 feet. Light east. Would 8 feet of length, glazed on east side, as shown in sketch, give ample lighting? Would it be an advantage to have whole of east side glazed? Will it be necessary to have part of west side glazed also, in order to avoid direct sunlight in early part of day?"—Ten feet would be better, particularly for taking groups. It would also be convenient at times, say, early in the morning, if the west side were also glazed. If both sides are glazed, there will always be the option of lighting the sitter from either side.

**SPOTTY PRINTS.**—SPOTTER. "I have been greatly troubled lately by spotty prints like the enclosed; could you inform me the cause of them? I use sulphocyanide bath, hypo quarter of a pound to the quart of water, and twenty minutes fixing. The spots do not appear until the prints are mounted and dry."—Several causes will produce spots similar to those on the enclosed prints, but which of them has been the cause in this instance, when no data to form an opinion upon are given, it is impossible to say—beyond faulty work. We notice, however, that the fixing bath used is but half the strength usually employed. That may have, with other causes, contributed to the spots.

**SENSITISING BATH.**—R. SUMNER writes: "I am only an amateur, and am trying albumen paper. Having read that home-sensitised paper gives better tones than the ready-sensitised, I have been trying my hand with that, and I certainly prefer it. The bath is 60 grains to the ounce; but, after using it two or three times, it becomes a dark colour, and that with each lot I have used, which means to me a great waste."—In reply: There need be no waste whatever. All that has to be done is to add a little kaolin to the solution, then well shake for a minute or two; the solution will then, after resting a few hours, be quite discoloured and as good as at first if filtered. The kaolin may be left in the bottom of the bottle, as it does over and over again.

**STUDIO LIGHT.**—A. MARTIN says: "The studio I am working in I can only work one end, the shadow side covered in and three feet top and side, the end I work with, covered with dark curtain; please inform me the best way to light a sitter. Should I place them direct under the top light or place them nearer the background; an answer will oblige!"—The sitter should certainly not be illuminated by a direct top light. Not knowing the form of the studio or its aspect, we can offer no advice. Of course, each sitter requires a different lighting to suit the features and the effects desired. We should advise you to get a professional in your neighbourhood to give you a few lessons, as you appear to be ignorant of the subject of lighting.

**COPYRIGHT.—FAIR PLAY.** You certainly cannot prevent your competitor from showing an enlarged portrait of one you took, and selling reduced copies of that if he likes. You received "a valuable consideration"—were paid for taking the portrait, which the sitter can do as he likes with. He has given your townsman permission to do what he is doing, and why should you have any voice in the matter?

**MONIQUE SURGENS.**—1. On examination some time ago we found it useful and practicable. 2. We safely changed very rapid plates in it in the open. 3. Yes. 4. The film there mentioned is a rollable one; but we have used stout celluloid specially surfaced for focussing purposes. The fine grain is in its favour, and you do not run the risk of breakages. One lies on our table as we write this which we have had in use for years.

**WORKING HOURS.—EMPLOYÉ** writes: "What is the rule with regard to working hours? When I was engaged, the hours stated were to be from half-past eight to half-past six, with an hour for dinner. During the winter months there is nothing much to do after dark, but — & Co. will not let us leave till half-past six. Is it not usual for employés to leave off at dark?"—If there are stated hours in the agreement, they should be abided by both winter and summer. We presume the firm will not expect you to remain after half-past six in summer, though much might be done after that. When employés are allowed to leave earlier in the dark days of winter, they are expected, *quid pro quo*, to stop later in summer if there is work to be done. But an agreement is an agreement, and should be adhered to.

**STUDIO WITH SOUTH ASPECT.**—REX writes: "I seek your valuable advice in an important venture I have been contemplating. I am a young photographer, and am desirous of opening a studio of my own. I have the offer of premises in a good position at 30l. a year rental, with lease. I should have to knock the building about to get my studio, there not being sufficient yard room to erect one. When I have done this, there will be a south light. Would you advise me, all other conditions being favourable, to refuse the offer on account of the light being south? I should be very grateful if you would let me know your views in this week's JOURNAL, as the landlord is waiting for my decision."—Very successful portraits can be, and are, taken in studios with a south light. Such studios are a little more troublesome to work, at times, than those having other aspects. There is no reason why, if you are a skilful photographer, the premises, if otherwise suitable, should be rejected on account of the south aspect.

**MATT ALBUMEN PRINTS.**—F. C. writes: "Would you have the kindness to help me out of a difficulty I seem to be unable to abridge? I am endeavouring to turn out albumen prints (with a special warm tone I obtain) with a dead matt surface, collodionising the glass as for ordinary bright enamels, only on ground glass or matt opal. However, I cannot seem to meet with any success. First, the collodion film used to split, and I always find them inclined to come off the plate too soon, i.e., before dry. When they come off, the surface has not taken that of opal—only to a slight degree—and there seem frothy, bubbly marks all over, although every precaution was taken. I regret that I cannot tabulate this query into numbered questions, as I do not know exactly what to ask, but shall be very pleased if you will kindly do anything to help me to do what I am striving for. Thanking you in anticipation."—It seems to us that, in using collodion, you are increasing the gloss you are anxious to get rid of. Have you tried working without the collodion? The next thing we should suggest is to use but a lightly albumenised paper, and squeegee that while wet on to finely ground glass, or, better still, use plain salted paper or paper prepared with diluted albumen, say, one part of albumen to two of water.

**ILL EFFECTS OF METOL.**—GOLFER says: "To facilitate the turning out of my orders in these dark and unprintable lighted days, I had to go largely in for Velox papers, which I got splendid prints on, using their special portrait paper and the following developing formula, which is very near 'Barnet' formula for their bromide papers, namely: A.—Metol, 100 grains; soda sulph., 2 ounces; pot. brom., 16 grains; aqua, 20. B.—Potass. carbonate, 1 ounce; water, 20 ounces. For developer use 3 parts A to 1 part B. The only drawback has been that these chemicals have seriously affected my fingers in lifting the prints, the skin turning white, as if burned, and a dead or want of sensitiveness feeling; while there is no pain, there is a burning or itching sensation in the part affected. After a time the skin peels off, but, before this takes place, the skin cracks before the under skin has had time to grow, and exposes the flesh, and, should it be under the nails, which is often the case, a good deal of pain may take place. I may state that I have used finger stalls, but even this does not prevent it, as the stalls roll up in taking off, and in time get saturated with it on the inside, and it is then worse than ever, as the whole finger is affected. Is it the metol or potass. carbonate that is the cause? So many use Velox paper, or, I should state, metol developer, that you will be conferring a great benefit if you will kindly give, first, an antidote; or, second, another formula for Velox paper that will not cause any discomfort to the user. Thanking you in anticipation."—Metol is liable to produce trouble, such as that described, with some people, though not with others. It is very erratic in that way. If the developer recommended by the makers of the Velox paper be employed, and used with a brush as directed, no trouble will be experienced, as the fingers need scarcely come in contact with the solution. India-rubber finger stalls are a certain preventive, if ordinary care be taken that the solution does not get inside them—a very easy matter. Avoid the solution getting inside the stalls, and take the precaution to wash off the developer before the stalls are rolled off. If contact with the metol be avoided, the sores will quickly cure themselves.

\* \* Owing to exceptionally great pressure on our space, we are again compelled to hold over numerous articles, answers to correspondents, &c.



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## EX CATHEDRA.

A NOTABLE addition to London studios has just been made by Messrs. Langfrier, the well-known photographers, of Glasgow. The new atelier is situated at No. 23A, Old Bond-street, and on the east side of that fashionable thoroughfare, a position that is unrivalled for the opportunity it affords of cultivating a high-class photographic business. The suites of rooms occupy two floors, and have been specially designed and built for their respective purposes. Access to them from the ground level is obtained by means of a lift, so that sitters and visitors are spared the trouble and fatigue of mounting two or three flights of stairs. We write under correction, but we believe that the new Langfrier studio is the only one in London that affords its clientele the very modern and very acceptable convenience of the elevator.

THE reception room is of noble proportions, measuring approximately fifty feet by thirty feet. It is furnished and decorated in the best taste, and the walls are covered with

a well-chosen selection of Messrs. Langfrier's very excellent portrait work, so that the visitor is made to feel that he has entered a beautiful gallery of photographs rather than the mere ante-room of a photographic studio. In respect of the dimensions of their reception-room we should not be surprised if Messrs. Langfrier had established a record; to our knowledge, there is not another as large in the country. The Langfrier studios have been in course of erection for nearly a year, and have cost several thousands of pounds. They are furnished and fitted throughout, even down to the minutiae and details of the dark rooms, printing rooms, and so forth, with the keenest regard to completeness, convenience, and good taste.

\* \* \*

SPECIAL reference is demanded by the studio; this measures about forty-five by twenty feet, with a height of twenty feet. Instead of being ridged on the glass side, the corner has been rounded off, and the glazing has been carried to the middle of the roof. One end of the studio is occupied by a perfectly built-up stage, having a raked floor, proscenium, curtains, footlights and scenery dock, all complete, for stage photography. A total candle power of 50,000 is obtainable from incandescent lamps, so that any effect of stage lighting can be secured. It is anticipated that even cinematographic pictures will be taken on this attractive little studio stage, the convenience of which to members of the theatrical profession and others must obviously be very great. When in working order, this very fine studio will allow of practically anything or everything in indoor portraiture and group photography being produced in it. The daylight is uninterrupted, and the incandescent electric light is always at hand in emergencies. The Langfrier studio starts as well equipped as enterprise and good judgment can make it, and we wish it the success it merits.

\* \* \*

WE announced some months ago that the West Surrey Photographic Society had organized for its members a novel competition, namely, the photography of fruit or vegetables. The competition has just been decided, and was very successful, thirty-seven prints having been sent in. We are pleased to learn that these prints were of such high average merit that the Judges, in addition to the guinea prize, which went to Mr.



E. W. Burch for a group of grapes, lemons, &c., with a claret jug (an ingeniously selected group, by the way), highly commended the same gentleman's group of vegetables, commended two prints sent in by Mr. Curtiss, and one sent in by Mr. Pointon. The winning prints have been submitted to us for our inspection. Mr. Burch has been wonderfully successful in his tone renderings, and, indeed, all three gentlemen show great skill in their work. We congratulate the West Surrey Society on the success of their interesting competition, which is to be followed by one for a book plate for the Society's library.

A CORRESPONDENT writes to us as follows with respect to Mr. E. Sanger Shepherd's lecture on "Photogravure" at the Camera Club: "I notice in his lecture at the Camera Club, on Thursday fortnight, Mr. Sanger Shepherd mentions Captain Abney's process for making transparencies by sensitising an ordinary unexposed gelatine bromide film with bichromate of potash, and, after drying, exposing and developing as for ordinary carbon tissue, thus producing an image composed of varying thicknesses of bromide of silver and gelatine. So far so good; but why Captain Abney's process? It was published, if I mistake not, by Mr. H. Y. E. Cotesworth twelve or thirteen years ago—at any rate, I know I tried it successfully from instructions published in the JOURNAL about that time. I can, perhaps, nearly fix the date by saying that I used Obernetter's gelatino-chloride print-out paper, which was almost new then, because ordinary gelatino-bromide films, being generally more or less 'alumed,' were, at best, uncertain in action, whereas the perfectly soluble chloride film was quite certain."

The writer goes on to say: "The paper was fluted on, or immersed in, a solution of bichromate in the ordinary way, which turned it bright red owing to the free silver, and this colouration, as pointed out in the article describing the process is rather an advantage than otherwise since it prevents the light penetrating the film too completely. If, however, it be objectionable, an equal quantity of bromide of potassium may be mixed with the bichromate, when the sensitised film will be pure yellow. In either case, when dry it was exposed until the image was fully visible, squeegeed on the glass, and developed in the ordinary way. I showed some lantern slides made in this way from Obernetter paper to the late Mr. Traill Taylor in 1886 or 1887, and I scarcely think the change from that medium to rollable celluloid films can constitute a new process." We have referred to back volumes, and find the process referred to is described by the late Mr. H. Y. E. Cotesworth in an article in our issue for March 4, 1887, p. 132.

DICKENS'S birthday, February 7, will be marked this year by a lecture on "The Real Dickens-land," given in the Assembly-room of the Bull Inn, Rochester, famous as the scene of the ball attended by Tupman, the friend of Pickwick, and the perfidious Jingle. The lecture will be in aid of the restoration fund of Rochester Cathedral, and will be delivered by Mr. H. Snowden Ward. The chair will be taken by the Dean of Rochester. We have seen many of the photographs that will be shown as lantern transparencies on this occasion; they are by Mrs. Ward, and are of remarkably good quality. We understand that Mr. and Mrs. Ward shortly leave for the United States on a lecturing tour, and we have no doubt that not the least popular of the series will be those with "Dickens-land"

for the subject. Our hearty good wishes accompany our friends on their journey.

THE very latest aspect of coupon photography is communicated by a Brisbane correspondent to an Australian contemporary. The circular that is issued reads as follows:—"Important Announcement. The Manager of the ——— Hairdressing Saloon, ——— street, will give to each customer, for Shaving or Hair-cutting, a Discount Coupon. When twelve Coupons have been issued to any customer, he will, on presenting them to Walter E. Perroux, proprietor of the Austral Photographic Studio, receive three enamelled cabinet photos of himself, mounted on Christmas cards or otherwise, and equal in finish to the best produced in Paris or Vienna. The coupons will be transferable, and the issue will be limited to twelve to each person." Coupon photography here at home is "played pretty low down," as the current phrase goes, but we doubt if it has yet reached the depth here indicated.

M. TANQUEREY, the free portrait exploiter of Paris, is irrepressible. In the last batch of literature, which the British Post Office so amiably assists him in distributing amongst people who in all probability get no opportunity of learning the real nature of the man's business, he quotes a number of what he terms "testimonials" from the English press. Extracts from our contemporaries, *Truth*, *The Morning Leader*, and *The Daily Mail* are given which are cleverly made to appear favourable to "Tanqueray." With regard to the first-named paper it is matter of common knowledge among its readers and others that Mr. Labouchere has not hesitated to emphatically denounce Tanqueray and his methods. The quotation from the *Daily Mail* is an extract from an interview with Lady Colin Campbell, who really received an enlarged portrait free of charge, and who, in return, is quoted as saying that Tanqueray "deserves every support from English people!" The lady is scarcely to be congratulated on her choice of a *protégé*. Among the quoted testimonials is the following letter to the *Yorkshire Post*: "I beg to write to say that I had SIX portraits done by Mons. Tanqueray of Paris. The crayons are most excellent and were valued by a local photographer at 80 shillings each. I am still ordering others.—Lewis Mothley, Spen-lane, Kirkstall, Leeds, November 22, 1893." Mr. Warren, the able President of the Leeds Camera Club, who contributes an interesting column on photographic topics to the *Yorkshire Post* every week, would be doing photography in the North of England a distinct service by counteracting the misleading effects such a letter as the above is calculated to have when published in so influential and widely read a paper as the *Post*.

#### DEVELOPING PRINTING-OUT PAPERS.

THE development of gelatino-chloride papers is by no means a new topic, but just recently it has again been brought prominently forward by a paper read before the Royal Photographic Society by Mr. Sterry, and previously by an article in our columns by Mr. W. E. A. Drinkwater. That good results can be produced by this method on some papers is beyond question, but whether it possesses any practical advantages over the employment of the papers specially prepared for development remains to be seen. We have just said that good results are obtainable on some papers, and we emphasise the



"some," inasmuch as many workers, especially amateurs, seem inclined to look upon "printing-out papers" as a definite article, and as being of one and the same composition, whatever the brand. As a matter of fact, there is a wide difference in the characteristics of the various printing-out papers now on the market. Hence it is obvious that the development treatment and formula that will yield good results with one make may not do so with another. Therefore experimenters in this direction should not, in the case of failure, attribute it to either the method or the formula, but rather to their not being adapted to the particular brand they have tried.

Here is another point in connexion with the development of commercial gelatino-chloride papers that should be taken into consideration. In the manufacture and handling of printing-out papers the same scrupulous exclusion of actinic light that is imperative with bromide papers for development is unnecessary; but it is manifest that, if the former are to be subsequently submitted to a developing agent, any trifling actinic action, either before or after printing, will result in more or less fogging of the lights, although it would have no effect whatever if the paper were employed for the purpose for which it was put upon the market, namely, for printing out and afterwards toning. We call attention to this matter, because it may have been the cause of some of the failures of those who have been, at one time or other, experimenting with gelatine printing-out papers and development.

### MINIATURE PAINTING.

THE Society of Miniature Painters, of which Sir William Richmond, the grandson of a miniature painter, is the President, has opened an Exhibition, not the first, at 175, New Bond-street. The Exhibition is, necessarily, not a large one, superficially, but it contains a number of works of considerable merit, which it is not our present purpose to comment upon, beyond saying that portrait photographers will do well to visit it and study the styles of colouring, with the view to the more prominent introduction, or rather reintroduction, of coloured photographic miniatures on a permanent base. There is no question that photography killed miniature painting of a class soon after its *début*. We say of a certain class, for at that time there were miniature painters and miniature painters. There were Cosways and "Miss La Creevy's," so well described by Dickens. However, it is noteworthy that one of the foremost miniature painters of their day, Sir William J. Newton, was one of the founders of the Photographic Society, now the R. P. S. At the inaugural meeting in 1853, under the presidency of the late Sir Charles Eastlake, then President of the Royal Academy, Sir William J. Newton moved the first resolution—"That a Society be now established, to be called the Photographic Society." From this it will be seen, at the first, how artists looked upon photography.

When portraits of the La Creevy type were killed, coloured photographic miniatures, Daguerreotypes, paper pictures, and glass positives came to the front—coloured and uncoloured. Brooches and lockets with portraits, sometimes with the portrait on one side and hair—arranged by "artists in hair"—on the other, were the fashion. At that time a good business was done by the best establishments with coloured miniatures at from one to ten guineas and upwards each; but they were works of art. They were also of a class to be had for

a few shillings. But fashion changed; portrait and hair jewellery went out of fashion, and a feature of coloured photographs, once a very lucrative one for the smaller sizes, was neglected when the *carte-de-visite* mania set in, and has not since been revived with any spirit. Possibly, however, the energy of the newly formed Society of Miniature Painters may give a fillip to coloured photographs, if they are made works of art—not what are now called coloured photographs, done for a few shillings each.

**A Novel Point.**—A few weeks ago we alluded to a matter that may prove an important one to photographers. It was this: In taking some snap-shots of an old inn, a well-known man in the district was included in the pictures, which were subsequently shown before a large audience at the Shettleton Camera Club. It happened that the person in the foreground had a strong objection to being photographed, and threatened legal proceedings against those concerned, and the Club in particular. It now appears that the matter will be brought to a practical issue, for it is stated that the gentleman has actually commenced proceedings, which will shortly be tried in Glasgow, he claiming 150*l.* damages on the ground that, while following his usual calling, photographs of him were taken without his knowledge or consent, and afterwards publicly exhibited. The issue of this case is an important one to photographers, for, if it succeeds, it will materially interfere with instantaneous photography, followed commercially. For example, in photographing a ceremony, as, say, in the launching of the *Oceanic*, hundreds of people must be included in the picture, and, if any one of the number can prohibit the publication of the picture, it will be an important matter; but, possibly, there is more in this particular case than we are aware of at present.

**Art in the City.**—There is shortly to be unveiled another handsome fresco to the adornment of the interior of the Royal Exchange. The new picture has just been completed, and is the work of Mr. Stanhope Forbes, A.R.A. It represents the Great Fire of London, a most appropriate subject for a City picture. The spectator is supposed to be standing by the river side in the vicinity of the old London Bridge, with crowds of excited people filling numerous boats moored to picture-que wharfs. Of course, such a subject is a difficult one to deal with, and is entirely imaginative, but the artist has proved himself equal to the occasion so far as making a fine historical picture from the meagre authentic records available. Slowly but surely the City, which is said to be devoted solely to business and money-making, is acquiring art treasures that may some day be a credit to the chief city of the world. The permanent collection of paintings now at the Guildhall is good, while the annual loan exhibitions always contain some of the finest works in the kingdom.

**Spy Mania in Spain.**—According to a Reuter's telegram, the spy mania has extended to Spain, for, according to it, from Palma, Majorca, a mysterious person, said to be an officer in the British army, is travelling about the island taking photographs. It is also added "that he is under the observation of the authorities at Mahon, and that reports upon his movements are sent every day to the prefect." Such is the report. In many countries a photographic suspect would be unceremoniously "run in," but, according to the telegram, they are more considerate in Spanish territory with regard to foreigners. However, as we have often said before, English photographers, travelling in foreign countries, should be careful where they use their cameras, because the authorities do not always, as it would seem they do in Spain, shadow the tourist, and send daily reports to the authorities, before they subject him to sometimes serious inconvenience.



## DEFECTS IN PLATINOTYPE PRINTS.

SEVERAL correspondents of THE BRITISH JOURNAL OF PHOTOGRAPHY having complained of the difficulty they experience in obtaining good vigorous and rich prints in platinotype, the following notes on the most usual causes of poor weak or "mealy" prints may be of assistance in ascertaining and removing the cause of failure, it being assumed that the paper has been kept thoroughly dry until the time of development, and that the negatives are sufficiently vigorous to give a rich print. Unless these two conditions are fulfilled, it is useless to expect good results.

The most common cause of weak prints, without any richness of tone or force, is that the developer is too cold, and it is noteworthy that two recent correspondents complain that only during the last two or three months have they been troubled with this falling off in the quality of their prints. Whatever strength of solution is used for developing, it should never be colder than about 65°. In many cases a stock solution is kept in a very cold place, and may, in addition, be diluted at time of using with water drawn from a tank so situated that its temperature is always low, and this may be an unsuspected cause of failure to obtain the same quality as similar working had given in the summer time, when the temperature of the air was much higher. Platinotype paper for cold development can be developed at almost any temperature, but from 60° to 90° may be taken as the two extremes for the best results. At 80° or 90°, the strength of solution remaining the same, a print will be more vigorous and also warmer in tone than if developed at 60° or 65°; increasing the temperature above 100° has the effect of making prints muddy and dull, while below 60° the tendency is to give a very cold tone and absence of strength.

Other causes of want of vigour are, first, too weak a developer. Whether the Platinotype Company's "developing salts" or potassium oxalate are used for developing, the most desirable strength for average work is one part stock solution and one part water; the stock solution being either one pound of potassium oxalate dissolved in fifty-four ounces of water, or half a pound of "developing salts" in fifty ounces of water. Diluting these solutions has the effect of giving a warmer tone and lessening the force and vigour of the print, for weak negatives they may be used undiluted.

Second.—Developers kept too long after diluting. The stock solutions will keep indefinitely; when diluted they deteriorate rapidly, especially if used.

Third.—Too many prints developed in a weak solution. Diluted developers should be used for a moderate number of prints only and thrown away after once using.

Fourth.—Developer, whether strong or weak, exposed to strong daylight after using and then used again, the resulting prints are muddy and flat.

If carefully kept from light, either of the stock solutions given may be used again and again, and if made up to the original bulk from time to time with fresh solution of the original strength, will remain in good working order for years. This was the usual method of working with the hot-bath process, but with the cold it has frequently a tendency to give harsh contrasts with rusty or bronzed shadows if solarisation has commenced. This bronzed effect can be always avoided by diluting the developer.

One correspondent complains of streaky markings. These may be caused by immersing the print in a small quantity of solution and allowing it to touch the bottom of the dish during development. There is no objection to immersing the print instead of floating, but it should be taken as little below the surface as possible. Or, another cause may be seen on the developer; this can be avoided by filtering the stock solutions and keeping them corked. Or, air bubbles may form on the print and not be noticed until the remainder of the print is almost developed; it is difficult in such a case to prevent markings. As soon as a print is in contact with the developer it should be raised and any air bubbles broken; any part that has not been in contact with the fluid will develop up and show no markings if the print is immediately immersed again, but not more than three or four seconds should elapse from the time that the print is first brought into contact with the developer and its second immersion.

A most instructive experiment, one that would teach more than volumes of writing, would be to take several prints, or small pieces of prints, and develop them at different temperatures varying from about 50° to 120°, and with strengths of solution ranging from undiluted stock to one part stock with five or six parts water.

Platinotype is a beautiful and exceedingly simple process; but, in order

to secure its full beauty, its capabilities require careful study, and it would appear that in many instances its simplicity prevents its receiving that careful attention to small details that is essential even in the simplest work if success is to be attained.

HENRY W. BENNETT, F.R.P.S.

## FOREIGN NEWS AND NOTES.

**The Action of Ammonium Persulphate.**—M. Hassreidter stated recently before the Association Belge de Photographie that he had found that ammonium persulphate acted quite differently to other reducers, and did not attack the shadow details, but rather the high lights, a fact which has also been noted in England. He further stated that he found that a two and half per cent. was the best strength to use, and that, as the reduction continued during washing, it was advisable to stop the action by immersing the plate in a solution of hyposulphite of soda.

**Photography in Colours.**—Before the Louvain section of the Association Belge de Photographie the process of M. Dugardin, which was briefly referred to last month in our columns, was fully described, and it turns out to be the three-colour process, and the superposition of three carbon positives, which is by no means new; but there is one point of novelty in the process, unless no less than three mistakes are made in the report. Three negatives are obtained by suitable screens and orthochromatic plates; the actual words of the report are: "L'un par les radiations jaunes, l'autre par les bleues, et le troisième par les verts, c'est-à-dire par les trois couleurs fondamentales du spectre." From these negatives bichromated gelatinised papers containing yellow, green, and violet pigments are printed and then superposed. The novel point is the use of yellow-green and violet pigments as reproduction colours. One naturally wonders how red or purple would be formed.

**Encore et Toujours la Photographie des Couleurs.**—We also referred last month to the Mathieu-Dery process, and further details are now given, and it is interesting to note that the description, which, by the bye, was given by M. Mathieu, is a marvel of inconsistencies. In the first place he claims to have made a plate sensitive to red and yellow, and *insensible to blue*, another sensitive to yellow and blue, and insensitive to red; this, judging from the plates our English makers turn out, is not a difficult job, and a third plate sensitive to red and blue but not to yellow; some few would like to know how this is done. He further claims that each of the plates is so prepared as to allow three colours to act which are wanted to act, and that they should not be affected by those which are not wanted to act, and yet he uses light filters to cut out certain colours! The following passage is very hopeful: "J'estime que le temps n'est pas loin où les écrans seront complètement mis de côté, et le triage rigoureux obtenu uniquement par les qualités spéciales des trois émulsions." This hails, we know, from the land of Ducos du Hauron and Cros; but what do some of our plate-makers say to it? The rest of this paper we may dismiss, for the author not only claims to have done what no one else has, and what is generally considered by those who have paid most attention to the subject to be impossible, but he also claims for his process of photography in colours the total abolition of that want of perspective and depth which characterises all monochrome photography.

**The Gum-bichromate Process.**—Herr Watzek points out in the *Photographisches Centralblatt* that it is always advantageous to give the paper used for gum bichromate a preliminary sizing, and he has found that chrome gelatine is the best; and, if plain gelatine is used, the colour mixture is partially and locally absorbed, and the result is that it is difficult to obtain clear high lights, and too often patchiness of the prints results. The particular strength of the chrome gelatine recommended is five per cent. of a five per cent. solution of chrome alum in a five per cent. solution of gelatine, and the mixture must be applied hot. At the suggestion of Herr Ghiglione, he had tried with success the use of decomposed gelatine; a five per cent. solution of gelatine was exposed in an open vessel till it had become mouldy on top and liquid underneath, the liquid portion was poured into a bottle, and, to every 1000 parts, from five to ten parts of formaline added and kept well corked; this can be diluted with water to any extent, and for thin papers should be diluted with about an equal quantity of water, but used full strength for drawing papers.



## ON THE PRODUCTION OF WARM TONES ON BROMIDE PAPER.\*

URANIUM toning has been discussed so copiously in the photographic press of recent years that I do not propose to touch upon it, except in passing. It yields a range of very rich red and brown tones, which, however, are freely soluble in water and of doubtful permanence. The prints must be lightly developed, as the process is one of intensification. The developer should not be ferrous oxalate. They must be thoroughly fixed and thoroughly washed, and chemical contamination in every shape avoided. In order that the solution may act uniformly, the print, if it has been dried, must be first soaked in clean water. If the colour produced is not satisfactory, the print may be restored to its original condition by immersion in a bath of three or four drops of ammonia to a pint of water, and, after further washing, may be again toned. Some improvement results from following the toning by a two per cent. solution of ammonium sulphocyanide, which also helps to get rid of the bichromate stain. Other points to be noted are, that the full force of the water from the tap must not be allowed to fall on the prints, and that they must be blotted off after washing, or some other means adopted to prevent unequal drying.

We next come to the methods of bleaching and subsequent redevelopment, which all yield warm tones. The bleaching agent may be potassium bichromate, ferric chloride, cupric chloride, mercuric chloride, or potassium ferricyanide, and, which ever we may select, it is necessary to add hydrochloric acid. The best is—

Potassium bichromate.....	5 grains.
Hydrochloric acid.....	10 minims.
Water.....	1 ounce.

The well-washed print is immersed in this and thoroughly bleached. It must then be washed to remove the bichromate stain, and it is then ready to be developed. Fifteen grains of Schlippe's salt to the ounce of water produces a Bartolozzi red, and, according to the books, an addition of a few drops of ammonia darkens the colour to a reddish-brown, a result which does not uniformly follow.

An alternative method is to darken the bleached image in a bath of from ten drops to one drachm of ammonium sulphide to twenty ounces of water. This produces tones ranging from a yellowish-red to a dark brown, a vigorous original and a stronger solution of the sulphide yielding the darker shades, and the weaker solution generally tending to produce the less attractive yellowish tones. The bleached image may be developed in the ordinary sense of the term, using any non-staining developer, and this is a capital means of saving a print which is of a bad colour. Probably, by the use of a weak and well-restrained developer and a prior exposure of the bleached print to daylight, a warm-toned image might result, but I have not had time to try this. The image may also be darkened up to full intensity by sunlight, but it takes three or four days' exposure, and the print must, in the first instance, be very vigorous and the bleaching action must be thorough. This method produces a very agreeable colour, very suitable for "misty morning" effects.

The bleaching bath may consist, as I said before, of ferric, cupric, or mercuric chlorides. As these possess no advantage over the bichromate of potash, and, on the other hand, the presence of the metal is a complication which renders it very difficult to avoid stains, and as they yield much the same tones as the bichromate method, there is nothing to recommend their use.

Whilst discussing these processes it may be remarked that the silver chloride image formed by the cupric and ferric salts may be darkened by exposure to sunlight—of course, after the copper or iron has been eliminated by the use of a weak solution of hydrochloric acid and copious washing—and the results are scarcely to be distinguished from those produced by the bichromate method. It may also be noted, with regard to the latter process, that the chromic stain may be removed very quickly and the washing much shortened by the use of a weak solution of sodium sulphite. In addition to the above bleaching agents, chlorinated soda, chlorine water, and others have been proposed; but, as their action is merely to convert the image into one of silver chloride, and as the final tone of the print is decided by its original density and the after-treatment bestowed upon it, the simplest means of producing the chloride of silver image should be selected, and this is to be found in the bichromate method.

Mercuric chloride as a bleaching agent is in some respects different to the others. The image does not darken appreciably by exposure to light, and it may be developed up to full intensity by the use of a combined fixing and toning bath, weak in hypo and strong in gold. Very good tones are produced, but mercury is not a desirable element in a photographic image, and the process is therefore better left alone.

A process recently recommended is to bleach in a five per cent. solution of potassium ferricyanide to which is added about one-tenth of its volume of hydrochloric acid (this seems unduly strong in acid). After washing, the print is developed in a weak and well-restrained developer. This is said to produce warm tones, but I have not had any opportunity of testing it.

\* Concluded from page 58.

Bromide prints may also be bleached by an aqueous solution of iodine and iodide of potassium of a dark cherry colour, and afterwards darkened by either a solution of Schlippe's salt or ammonium sulphite, the former producing reddish tones and the latter very fine browns.

This is a method which I can confidently recommend, as it is easily worked and the results are very satisfactory. In any formula involving the use of iodine the print is instantly stained a deep blue, due presumably to a combination between the iodine and the starch sizing of the paper, iodide of starch being formed. Washing in running water for half an hour, followed by a few hours' soaking, will get rid of the most obstinate case of this stain; but, by the use of a weak solution of sodium sulphite, to which a drop or two of hydrochloric acid is added, it is quickly decomposed, and a much shorter washing will then suffice. In no case, however, should the washing be hurried over, as stains may appear on the application of the sulphite solution.

Before passing from this subject, I may remark that the results produced by these various processes of bleaching and subsequent redevelopment show signs of considerable permanence. Some have been subjected to the action of a strong clearing solution of thiocarbamide, alum, and hydrochloric acid, for twenty-four hours without the slightest reduction of density, alteration of colour, or loss of detail; others have shown considerable resistance to the action of reducers, and others have been exposed to light for twelve months without any appreciable change.

The production of warm-toned prints by simple development may well form the subject of a separate paper. Some tentative experiments have been made, using various lantern-slide formulæ, with pyro as the principal agent, and I have also tried pyro-acetone, but the results have tended more to greenish-yellows than to sepia and browns. This is just as might have been expected. A formula which will yield a rich sepia in the lantern slide will almost inevitably, in the case of a paper print, produce a nondescript colour of a yellowish tint. This difference is to be accounted for by the fact that, in the one case, we are dealing with transmitted light, and, in the other, the light is reflected. Ortol and ammonia and a partly oxidised amidol developer have been recently proposed as likely to give considerable richness of tone, and I remember having produced very satisfactory prints of a brown shade some years ago by the use of eikonogen; but, beyond the fact that the production of the desired tone was very uncertain, no details remain in my memory.

And now I leave the subject, with the consciousness that I have only touched its fringe, and that it may well supply an experimentalist with a solid twelve months' work.

J. BROWN.

## LOCAL REDUCTION OF DENSITY.

We frequently find, on examining a negative, that some part, it may be large or small, would be better if rather less dense, though the rest of the plate may be right, and those who have had long experience have generally become acquainted with satisfactory means of reducing those parts, and so balancing the general effect of light and shade; but some there may be who have not yet made this a study, and their work therefore lacks that degree of refinement which others possess.

Such effects are often brought about by patches of sunlight which come through trees on an outdoor group, or some article of dress in a portrait which is too light for its position, or a flower worn in the hair may destroy the effect of light on the face. In outdoor work a gable end may receive strong sunlight, and spoil the harmony, and with an interior there may be a patch of sunlight coming through a window—or a window in the picture may be too light and require to be subdued.

It is to obviate these troubles that remedies are sought, and, fortunately for modern photography, the gelatine plate or film lends itself to various plans which in the old collodion process would have been impossible.

We will deal first with very small spots, as these are comparatively simple. To reduce small spots the plate must be quite dry, and the point of a lancet used either as a scraper or to pick the spot out; if the plate is moistened in a slight degree by the breath of the operator, too large a part may be moved in scraping. If the spot is to be reduced only slightly, it is best done by making a solution thus:—

Water .....	1 oz.
Perchloride of iron .....	$\frac{1}{2}$ "
Hydrochloric acid .....	$\frac{1}{4}$ "

Apply this with a small brush and allow a drop to cover the spot for a few seconds, then apply a few drops of the ordinary fixing bath, or put the plate into the fixing and wash well afterwards. This plan done carefully will reduce a spot very neatly and evenly.

Another easy plan with small spots or markings is to cut the end of an old spotting-brush handle to a point, and, having dipped it in methylated spirit, rub it with some firmness on the spot, and then wipe off with a rag; continue this process till enough has been removed.

When we have larger parts to treat, there are several ways of doing it. Methylated spirit rubbed over the surface with a rag, pressing firmly on the part to be reduced, is, perhaps, the easiest plan and the safest, as the effect is so easily watched, and the plate requires no treatment after the spirit, as it does after the perchloride; but it is more suited to hard edges, as, for instance, making a distant sea line show, which can easily be done



if a piece of note paper is held to the line, and the spirit applied with the rag by being rubbed hard along the top.

For the shadows under clouds, or for reducing white pillars in a church, the spirit is excellent; but, for the general reduction of the whole foreground or one side of a negative, the best plan is to wet it thoroughly, and, while still very wet, flood that part to be reduced with the perchloride of iron solution above mentioned, diluted with about five times its bulk of water, as it would be much too strong as it is; this changes some of the reduced silver in the plate into chloride of silver, which must then be dissolved away by putting the plate in the fixing bath for two or three minutes. It will then be seen how far it has been reduced, and if it is not sufficient, it must be washed well and the perchloride again applied.

There are several other solutions for this purpose, but none are so simple and certain as this. The object of wetting the plate is to prevent a hard line being formed, and to cause the solution to act evenly. Of course, care will have to be used to prevent it from running where it is not required, by slightly inclining the plate. This plan will often cause clouds to become printable, when the density of the sky had previously obscured them.

If a plate has been over-exposed, and it is found difficult to get sufficient density in the sky without over-developing the scenery, it is a good plan to continue the developing till the sky is dense enough, and then, after fixing and washing, reduce the scenery in daylight till it is thin enough to print properly, leaving the sky alone.

ALFRED SEELEY.

### ARCHITECTURAL PHOTOGRAPHY.

Before the Gospel Oak Photographic Society, on Tuesday, January 17, Mr. C. Stone delivered a lecture on "Architectural Photography." In opening, the lecturer showed how well the study of architectural photography combined with the pursuit of other hobbies. The student of sculpture would find much to engross his attention in the decoration of our large cathedrals and churches. The lover of carving could gratify his passion, and the musical and historical enthusiast would be interested in the fine old organs, and the records which were to be found in the ecclesiastical archives, and the pictures and adornments of the fabrics themselves.

Architectural photography, to be really successful, must be made a speciality of by him who undertakes it, but the care, patience, and time expended upon its study and practice would be amply repaid by the results. A young friend of his, who had become the proud possessor of a hand camera, was advised to make his initial exposures on architectural subjects because "they did not move." Now, of all things in the (photographic) world, the hand camera was the least suited to the class of work with which he was dealing. The most suitable camera, and the one he would advise if one were dealing with architecture alone, was the square bellows pattern. This was a trifle heavier than the form with taper bellows, and, should the latter be selected, care should be taken to see that the taper of the bellows was not too sharp, otherwise some portion of the image might be cut off when using short-focus lenses. The camera should be fitted with all the usual movements, such as rising, falling, and cross fronts, and, most important of all, a swing back with plenty of play, as when one wished to secure pictures in which the ceiling was introduced, it often became necessary to tilt the camera pretty considerably, and to compensate for this tilting, and to prevent distortion of the image, the back would often have to be swung considerably. Levels—circular ones were preferable—should be affixed to the camera, and one should find a place on the swing back to indicate when the plate was accurately vertical.

Distortion was the *bête noir* of the architectural photographer. In most branches a slight amount would not be apparent, but the large number of parallel lines in the frames of windows, rafters of ceilings, &c., would necessitate the greatest care to prevent a grotesque result. This reason alone would put the single lens out of court, and only such lenses as give rectilinear images should be chosen. For ordinary work a lens of average focal length will be sufficient, say five or five and a half inches for a quarter plate, but in confined situations a shorter focus, or what is called a wide-angle lens, must be employed. This latter instrument should, however, be used very sparingly, and only on occasions when the longer-focus lens prevents sufficient of the image being obtained, as it is apt to give a bad perspective.

As regards the stand, this should be as high as possible, and of the most rigid pattern procurable, as the long exposures necessary gave many opportunities for vibration.

The best plates for general use were isochromatic ones, of what is usually called "ordinary" rapidity, and these, for the prevention of halation, should be backed. The lecturer stated that he had tried backing papers for the prevention of halation, but they were not successful, owing to the difficulty of getting optical contact; but a backing medium, put up in collapsible tubes, which was now on the market, seemed to be efficacious, and, moreover, was very cheap.

Despite all attempts to prevent it, halation would occasionally make itself manifest, and the best way of removing it was by rubbing down the negative with methylated spirits, applied on a piece of wash-leather in which the tip of the finger was wrapped. Considerable force would have

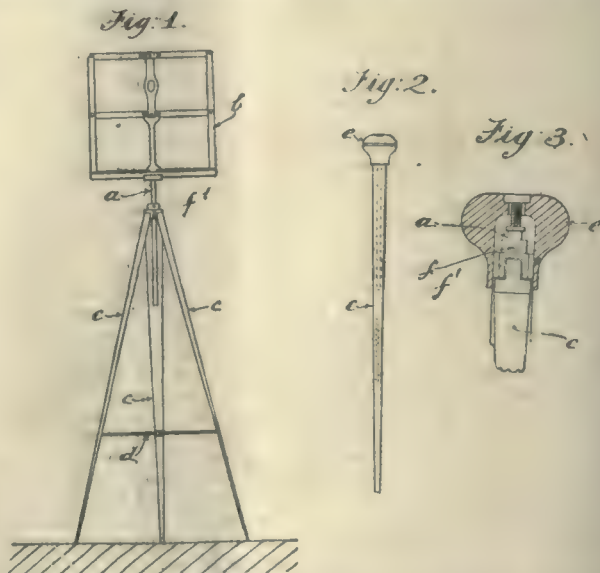
to be used in this rubbing, but no fear need be felt of damaging the negative, providing it was perfectly dry before commencing operations upon it. The negative should be laid on a level surface, however, otherwise there was a danger of cracking it.

Coming to the actual subjects themselves, one would always do well in writing to the authorities for permission to photograph, more especially in the case of interiors. A politely worded letter seldom met with a refusal; in fact, the lecturer said, he had never been refused but once, and in this case the interior of a country church was the subject, the reason given was that it was against the interests of the local photographers to permit views to be taken of the edifice. There was not much in the objection, however, more especially in the light of some of the commercial views he had seen. In some places a charge was made for admission, in others a charge was made both for admission and for permission to photograph; but in the majority of instances no charge was made at all, and usually everything is done to enable the photographer to pursue his hobby in comfort. It was a very good plan to make friends with the head verger before commencing operations, as that gentleman was often able to point out objects which might otherwise pass unnoticed.

Excellent results could sometimes be obtained by photographing a cross the nave of a church or cathedral instead of straight up the centre aisle, and attention should be paid to the peculiar carvings which were sometimes to be found at the ends of the choir stalls. The chancel was generally a difficult subject, owing to the large amount of stained glass which was to be found at the back of the altar. A dull day should be chosen for the photography of stained glass windows, and a backed isochromatic plate, with a screen, should be employed. The colour of the screen would, of course, vary with the character of the subject. For one containing much red and blue a rather dark one was best, such as to necessitate the exposure being increased four or five times, being about right.

### BURNETT'S COMBINED MUSIC AND CAMERA STAND.

MR. BURNETT'S invention relates to a new or improved combined music and camera stand, the object being to construct the stand so that it may be used either as a music stand or as a camera stand. In carrying out his invention he forms the legs of the stand of suitable material, and which are connected together at the upper ends by means of a socket piece. The legs are so arranged that they may be folded together, and a cap or cover screwed upon the top socket so as to maintain them in their folded position, when the whole may be used as a walking stick. Suitable stay rods are provided for giving rigidity to the legs when extended. The music-holder or stand is formed of strips or sections, which are pivoted



together so that it may be folded or collapsed when not in use, the music stand being provided with a socket piece which fits in the socket aforesaid when required. When desired, a camera may be carried upon the socket.

Fig. 1 is a view showing the invention in use as a music stand.

Fig. 2, side elevation of the same when folded up for use as a walking stick.

Fig. 3, vertical section to enlarged scale on top of the stand.

*b* is a music stand composed of strips and pivoted together, and adapted to be folded or collapsed when required. *c* are the legs of the stand, which are pivotally secured to the socket piece, *f*, being provided when required with the struts or supports, *d*. The socket piece, *f*,



carries the sliding rod, *a*, which may carry the music stand or camera, being secured in position in the socket, *f*<sup>1</sup>, by means of the set screw, *f*, or the like. When the legs, *c*, are folded together, and the cap, *e*, placed in position by engaging with the socket piece, *f*<sup>1</sup>, they are prevented from expanding or opening, and the whole may then be used as a walking stick.

If desired, the cap, *e*, may screw on to the rod, *a*.

### ESTIMATION OF GELATINE.

[From *Comptes Rendus*.]

THE insolubilisation of gelatine by means of formaldehyde soon suggested itself to chemists as a means of quantitatively estimating gelatine in food stuffs and other commercial products, and methods which make use of this reagent, have been published. In a recent communication to the Paris Academy of Sciences, M. A. Trillat describes the practical use of formaldehyde for this purpose, and, as his paper may prove useful to photographic experimentalists, we give it as it appears in the *Comptes Rendus* for November 7:—

"Dissolve the substance in water, and separate any insoluble matter by filtration or decantation. Evaporate the liquid to a syrupy consistency; add about 1 c. c. (17 minims) of commercial formic aldehyde, and continue the evaporation till the whole is pasty. Take up the residue in boiling water, which dissolves those substances unaffected by formaldehyde. The presence of gelatine is indicated by the presence of a loam-like deposit of insoluble gelatine. Before weighing this it is necessary to remove all soluble matters mechanically retained within its pores. To filter and wash is very tedious; it is best to decant the liquid. The precipitate settles completely in twenty-four hours, or, at any rate, merely leaves the liquid slightly opalescent. The insoluble gelatine is broken up and washed with boiling water until the washings contain none of the products associated with the gelatine, as indicated by suitable tests. The precipitate is then dried over a salt bath and weighed. Two examples of the accuracy of the process are here appended:—

"A mixture was made containing 35 parts of gelatine, 20 parts of gum, and 10 parts sugar. This mixture (65 grammes) was dissolved in 500 c. c. of water and 50 c. c. of the solution used for the estimation. The gelatine estimation was made within one per cent.

"A second mixture of gum (35 grammes), gelatine (5 grammes), and sugar (5 grammes) was prepared, the gelatine in which gave a figure differing from the theoretical result by only 0.5 per cent. The method is thus accurate enough for most cases. The presence of sugar does not affect the results. The increase in weight of the gelatine by combining with the formic aldehyde is quite negligible, as the latter passes almost entirely into the washings, a dissociation due to the great difference in molecular weight between albuminoid matter and formic aldehyde.

"In order to estimate gelatine in the presence of albumen or other substances coagulated by heat, these bodies must be first separated by boiling. In all cases it is better to add the formaldehyde to the substance in a pasty condition, as no precipitate separates from the dilute solutions. Albuminoid substances which have been rendered insoluble by formaldehyde are not attacked by alkalies or dilute acids, they are completely insoluble in boiling water, alcohol, ether, and neutral liquids."

### THE PHOTO-CHEMICAL ACTION OF TURPENTINE.

[From *Chemiker Zeitung*, 1898, No. 90.]

THE interesting experiments of Becquerel on the action of various substances on the photographic plate have been continued by Russell,<sup>†</sup> who has found that oil of turpentine has a strong action on photographic plates. Arguing from his experiments, Russell inclines towards the view, put forward by Stokes, that vapours of these chemically or photo-chemically active bodies are the cause of the darkening of photographic plates. From the first this explanation has not struck me as fitting in with the facts, for two reasons: (1) Because oil of turpentine, when acting on metallic haloids, separates from them not the metal but the halogen, with absorption of metal, whilst in the case of the photographic plate the metal is separated; (2) the photo-chemical action of turpentine takes place through media which are difficultly penetrable by turpentine vapour.

In order to decide whether the results of turpentine on photographic plates were due to chemically active vapour or to chemically active rays, I repeated Russell's experiments, selecting the oil which he states to be most active.

I had constructed a three-storied rectangular frame of pieces of wood 13 mm. (= 5½ inches, about) in length, 10 mm. (= ¾ of an inch) broad, and 8 mm. (= ⅜ inch) thick. The height of the frame was 80 mm. (3 inches), its breadth 90 mm. (3½ inches), and its length 134 mm. (5¼ inches). In each story a photographic plate was placed, and on the middle plate an open porcelain basin containing turpentine. The frame was placed on a plate of glass (ground matt), and covered with a

small glass shade, so that the turpentine and the plates were together in a confined space, which was of necessity saturated with turpentine vapour. The apparatus was set up and kept in a dark room, the plates being exposed to the action of the oil for from four to five days.

**Experiment 1.**—The plates were laid film up on the first and second stories, and film down on the third. After exposure all the plates were strongly darkened, but the middle one was transparent on and immediately around the place where the porcelain basin had stood.

**Experiment 2** was arranged as the first, except that the film side of each plate was reversed in position (turned over). After a similar exposure all the plates were blackened at the edges, but otherwise transparent. In both experiments the space in which the plates were exposed was saturated with turpentine vapour, so that all parts of the sensitive films were exposed to its action. If the blackening were the result of the action of a vapour, the plates in each experiment should have been completely blackened; but, as stated above, this was not the case. If, however, the blackening be assumed to be due to the radiation of the turpentine, the results of each experiment become explicable. According to my view, turpentine gives out particularly active photo-chemical rays, which fall directly on to the plates on the third story, as well as on the inner surfaces of the glass, and are then reflected to the other plates. In the first experiment every portion, and in the second only the marginal portions, of the plate could be struck by the reflected rays. The question arises, Upon what does this property of turpentine to emit radiation depend? The answer is not far to seek. The cosmic ether fills not only empty (planetary) space, but also the intermolecular spaces of every body. The ether in a body is not in a state of rigid equilibrium, but there is a constant exchange going on between the ether of the body and the ether in its neighbourhood. The only sense in which there is equilibrium is that a body receives in a given time as much ether as it loses. The molecules of a body affect the density, elasticity, and oscillations of the ether in their neighbourhood. The ether which surrounds the molecules of turpentine, and which is emitted by the turpentine, makes oscillations under the influence of the turpentine molecule which are similar to the oscillations of ultra-violet rays, and, like them, chemically active. I will return to this question later.

DR. JOACHIM SPERBER.

### WIGHT'S APPARATUS FOR DEVELOPING, FIXING, AND WASHING PHOTOGRAPHIC FILMS.

THE principal object of Mr. Wight's invention is to treat photographic films without handling them or exposing them to the light, and without the necessity of using a dark room, but it is also useful for avoiding handling in a dark room.

The apparatus consists of a box divided into two compartments by a movable partition, each compartment being provided with a door. The upper compartment contains a drum or reel, and the lower compartment has a false bottom free to rise and fall, being mounted as a parallel ruler, or in other like way.

The mechanism for removing the partition, turning the reel, and raising and lowering the false bottom is so arranged that it can be operated from the outside without admitting light.

In using the apparatus for treating a flexible film the doors are opened, and the end of the film to be treated is drawn into the upper compartment through a slit and fixed to the reel.

The upper door is shut and the reel turned, drawing in the film through the slit. When the desired length has been wound on the reel, it is automatically secured and separated from the remainder by a knife working inside the box and operated from the outside. A tray containing the proper solution or liquid is placed on the false bottom, the lower door is shut, and the partition removed. The false bottom is then raised until the solution in the tray comes up to film on the reel. The reel is then turned so as to bring all the film in turn into contact with the solution for a sufficient time. When it is desired to change the solution, the false bottom is lowered, the partition is replaced, and the tray removed through the lower door.

Figs. 1 and 2 are vertical central sections at right angles to each other. Fig. 3 is a section on the line 3—3 (fig. 2), the case, *m*, and reel being omitted.

Figs. 4 are central sections at right angles to each other of the printing case, *o*.

Fig. 5 shows a stand for the reel.

*a* is a box provided with two doors, *a*<sup>1</sup>, *a*<sup>2</sup>, and divided into two by a sliding partition; *b* is a shaft having one end working in a bearing, *a*<sup>3</sup>, in the side of the case, and the other end in a bearing, *d*<sup>1</sup>, at the end of a spindle, *d*, working in a sleeve, *a*<sup>4</sup>, projecting inwards from the door, *a*<sup>1</sup>. The spindle, *d*, is normally pressed inwards by the spring, *d*<sup>2</sup>, keeping the bearing, *d*<sup>1</sup>, in contact with the shaft, *c*, but it can be pulled a short distance outwards to disengage it, and held in that position by causing the pin, *d*<sup>3</sup>, to enter the bayonet joint slot, *a*<sup>5</sup>, in the sleeve, *a*<sup>4</sup>. *e* is a sleeve fitting on the shaft, *c*, and revolving with it by reason of a pin, *c*<sup>1</sup>, carried by the shaft entering a notch in a flange on the sleeve. *c*<sup>2</sup> is a nut screwing on the shaft and holding the sleeve in place. The sleeve, *e*, has fixed to it a disc, *c*<sup>1</sup>, carrying bars, *c*<sup>2</sup>, whose other ends are connected by an annular plate, *c*<sup>3</sup>, the whole forming a reel. By unscrewing the

\* THE BRITISH JOURNAL OF PHOTOGRAPHY, 1895, p. 214.

† *ibid.*, 1898, p. 213.

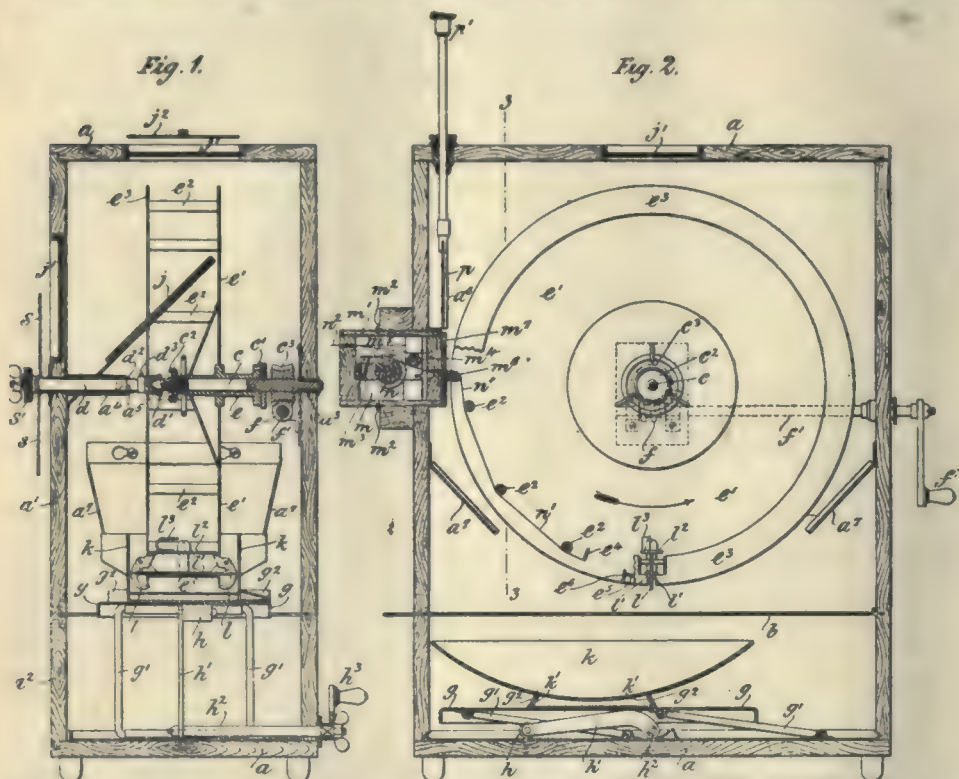


nut,  $c^2$ , the reel can readily be removed, and the width of the box is such that wider reels than that shown can be employed to receive wider films.  $c^2$  is a worm wheel fixed to the shaft,  $c$ , and gearing with a worm,  $f$ , on a

wards, the other round the roller and backwards. The lid,  $m^1$ , is then put on and the case inserted into the hole in the box,  $a$ , the parts being in the positions shown in fig. 2. The door,  $a^1$ , is opened, and the reel is

Fig. 1.

Fig. 2.



shaft,  $f^1$ , turned by a handle,  $f^2$ , outside the box.  $g$  is a false bottom mounted on parallel links,  $g^1$ , and raised and lowered by a roller,  $h$ , bearing on its under side. The roller,  $h$ , is carried by an arm,  $h^1$ , fixed to a shaft,  $h^2$ , turned by a handle,  $h^3$ , outside the box. When raised, the arm,  $h$ , is turned slightly beyond the vertical, and rests on a stop, so remaining in that position until the handle,  $h^3$ , is turned back again. In fig. 1 the false bottom,  $g$ , is shown raised, and in fig. 2 lowered.  $j$  is a mirror fixed to the door,  $a^1$ , and going inside the reel.  $j^1 j^1$  are sight holes glazed with non-actinic glass, through which the film can be inspected either directly or by reflection. The holes,  $j^1$ , can be closed by shutters,  $j^2$ .  $k$  is a bath having a dovetailed foot,  $k^1$ , fitting in guides,  $g^2$ , on the false bottom,  $g$ .  $e^4$  is a bar having its ends fixed to the disc,  $e^1$ , and annular plates,  $e^3$ . If it is intended to treat short lengths of films, several such bars are provided in suitable places, or the bar may be movable.  $l$  are a pair of jaws pivoted to and normally pressed down on to the plate,  $e^5$  (fixed to  $e^1$  and  $e^3$ ), by the spring,  $l^1$ .  $l^2$  is a lever pivoted to the plate,  $e^5$ , which, when the parts are in the position shown, comes above the tail end of the jaws,  $l$ , and holds the jaws off the plate,  $e^5$ .  $m$  is a case and  $m^1$  its lid. This case fits into a hole in a box,  $a$ , being prevented from entering too far by the ridges,  $m^2$ . The case,  $m$ , receives a frame,  $m^3$ , carrying a roller,  $m^4$ , and bearings for a spool,  $n$ , on which is wound the film,  $n^1$ , and black paper,  $n^2$  (technically known as a cartridge).  $m^5$  is a spring arm bearing on the cartridge and preventing it from accidentally unwinding.  $m^6$  is a roller at the front of the case,  $m$ . The case,  $m$ , might be dispensed with, pivots for the cartridges being provided inside the box,  $a$ , but this arrangement is not so convenient.  $o$  (fig. 4) is a somewhat similar case fitting the same hole in the box,  $a$ , and containing a spool,  $c^1$ , of sensitive paper or film, a printing frame,  $c^2$ , and a slide,  $c^3$ . At its front end is a roller,  $c^4$ .  $p$  is a knife working in guides,  $a^6$ , in the box,  $a$  (these are omitted in fig. 1), and  $m^7 c^5$  in the cases  $m$  and  $o$ ; it is operated by a handle,  $p^1$ , from the outside of the box,  $a$ .  $a^7$  are flaps or guards to receive drips and return them into the bath.

All the openings into the box,  $a$ , and cases,  $m$  and  $o$ , are rendered light-tight in well-known ways.

When employing the apparatus for developing a cartridge film which has been exposed in a camera in the ordinary way, the procedure is as follows:—

The cartridge,  $n$ , containing the exposed film, is taken from the camera and placed in the case,  $m$ . A short length of the film,  $n^1$ , and of the black paper,  $n^2$ , are unwound, the one being led under the roller,  $m^4$ , and for-

wards, the other round the roller and backwards. The lid,  $m^1$ , is then put on and the case inserted into the hole in the box,  $a$ , the parts being in the positions shown in fig. 2. The door,  $a^1$ , is opened, and the reel is turned by the handle,  $f^2$ , to bring the bar,  $e^4$ , close to the end of the film,  $n^1$ , which projects into the box. The film is then clipped or attached in any convenient way to the bar,  $e^4$ , and the door,  $a^1$ , is shut. The reel is then turned in the direction of the arrow (fig. 2), winding the film on to it, the corresponding length of black paper being simultaneously drawn out of the rear of the case,  $m$ .

Or the cartridge box may be provided with a receiving roller to take the backing paper, which roller may either be operated by hand from outside the box or automatically; in such case the slit for the backing paper is not required, as the paper does not pass outside the box.

After a time the flange,  $e^4$ , of the plate,  $e^5$ , comes against the roller,  $m^4$ , and prevents the further movement of the reel, and simultaneously the projection,  $l^2$ , on the lever,  $l^2$ , comes against the stop,  $a^3$  (fig. 3), on the door,  $a^1$ , and the lever is turned freeing the jaws,  $l$ , which are then caused by their spring to hold the film against the plate,  $e^5$ . The knife,  $p$ , is then forced down, cutting off the length of film which remains fastened on the reel. The knife is raised and the case,  $m$ , slightly withdrawn so as to allow the reel to turn, but not sufficiently to admit light. A bath,  $k$ , containing a suitable developing solution, is next put into place on the false bottom,  $g$ , the door,  $a^1$ , is closed, the partition,  $b$ , withdrawn, and the false bottom,  $g$ , raised. The reel is then turned by the handle,  $f^2$ , until the whole of the film has been sufficiently treated. The bottom,  $g$ , is then lowered, the partition,  $b$ ,

put in, the door,  $a^1$ , opened, and the developing solution replaced by a fixing or other solution or water. The same operations are repeated and so on until the treatment of the film is complete. The door,  $a^1$ , is then opened, the nut,  $c^2$ , unscrewed, and the reel with the film on it removed.

Fig. 5.

Fig. 3.

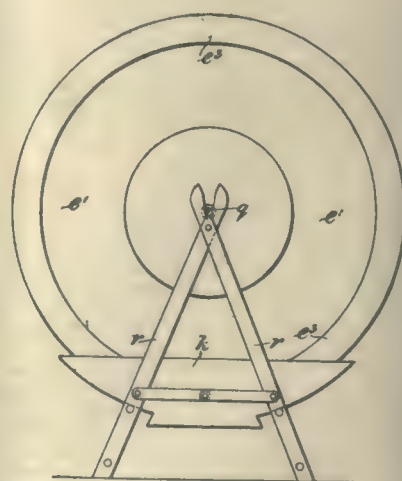
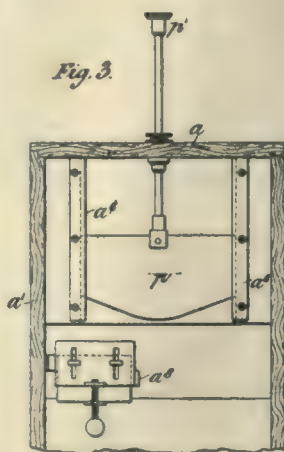


Fig. 4.



A spindle,  $q$ , is passed through the sleeve,  $e$ , and the reel, mounted on the stand,  $r$  (fig. 5), is put under a stream of water, which causes it to revolve, and thoroughly washes the film.



In using the apparatus for printing the procedure is very similar: The end of the sensitive paper is led from the bobbin, *a*<sup>1</sup> (figs. 4), through the slots, *a*<sup>2</sup>, *a*<sup>3</sup>, into the box, *a* (which is laid on its back), its end being attached to the reel as above described. The frame, *a*<sup>4</sup>, containing the negative, *a*<sup>5</sup>, is put into place, the slide, *a*<sup>6</sup>, is withdrawn, and the frame pressed home to bring the surface of the negative into contact with the film, and the shutter, *a*<sup>7</sup>, of the frame is opened. After a sufficient exposure the shutter, *a*<sup>8</sup>, is closed, the frame, *a*<sup>9</sup>, is pulled out sufficiently to allow the paper to be drawn through, but not sufficiently to allow light to enter, the reel is turned a short distance and the frame pressed home again. A second exposure is then taken, and so on, until the reel is stopped by *a*<sup>10</sup>. The knife, *p*, is then forced down, cutting off the paper, the length on the reel being treated in a similar manner to that above described. On putting in the slide, *a*<sup>11</sup>, the frame, *a*<sup>12</sup>, may be removed and the negative changed before the whole length of film has been drawn in.

Pointers, *s*, may be provided, capable of being clamped by a nut, *s*<sup>1</sup>, to the spindle, *d*, so that they turn with the reel. These pointers can be set to indicate the position of any parts of the film requiring special treatment, and also to indicate the amount to be wound on after each exposure in the printing frame.

If a dark room be employed, the reel is placed on the stand, *r* (fig. 5), a handle being fitted to the spindle, and the film or paper, as the case may be, attached to it, the necessary baths being placed in succession under the stand. In this way the photograph may be manipulated without any handling.

### PRINTING, TONING, AND FIXING.

As far as the general public are concerned, the above are the most important of the different manipulations in photography with silver printing (as it is usually called, or, more properly, printing out in silver, for bromide is also silver printing), as it is only with the finished print that the sitter is acquainted. This is the part where the skill, or want of it, possessed by the operator comes in, as, given the same negative, paper, toning bath, and hypo, two different workers will turn out a like number of dissimilar results, and a bad worker will get a bad result, even with the best materials.

Judging by the number of queries in the photographic papers, these are (to many) operations of extreme difficulty. No hard-and-fast rules can be laid down, as tastes in photos differ so widely in tone, finish, &c., but the following general remarks, may be found useful.

The first item to consider is the printing-out paper, and it is rather an important one, as, each of the three kinds of paper requires a slightly different treatment though not a great deal, and a little attention to the details mentioned below, will give the highest class results with least trouble and uncertainty.

As albumenised paper was most generally used until the last few years, we will take that kind first. Although the results upon it are not to be compared with the results upon emulsion papers, it is still very largely used, as it stands rough and careless handling better than the finer sorts of paper. One very great objection to it is its liability to fade; and its unreliability is illustrated by the fact that several prints out of one batch will prove almost permanent, while others, done at the same time and under the same conditions, fade very quickly. I have been told by the advocates of albumen that this is the result of careless work, and, if so, should feel inclined to believe that almost all workers in albumen were careless, as nearly all batches of albumen prints suffer from the same complaint, this, to start with, is a very hard thing to believe, as many photographers are careful and conscientious workers; but, beyond that, I know some photographs which were produced by careful men, and still some have faded, while others have kept beautifully—and the best of albumen prints, if exposed to sunlight, fade very quickly.

I have heard some photographers say: "I should like to use the emulsion papers, as one gets so much better results; but, as I have to put 300 or 400 prints into the bath at once, I am afraid they would be spoiled." Well, I am not afraid—I am certain they would, as a great many of the albumen ones are. Some photographers allow their assistants a very large percentage as "wasters," and surely it must be much better, and quicker in the end, to turn out almost the whole of the prints as good ones than have to allow a large percentage of waste, merely by doing a smaller number at a time, for any one with a knowledge of the scientific part of photography knows that it is practically impossible to manage several hundred prints successfully at once with even the most remote hope of permanency or reliability. But, even granting that it is possible or necessary with albumen, there is no need to do so with the emulsion papers, as the various operations proceed so much more quickly than with albumen, which requires to be so deeply over-printed to allow for the subsequent loss. It is probable that having to form the chloride in the pores of the paper itself causes albumenised paper to take longer in the working.

Gelatino-chloride, or P.O.P., as it is generally known in the trade, has taken a very large lead in recent years, and, although not quite an ideal paper, has many advantages over albumen, as it prints, tones, fixes, and washes much quicker, and, though it reduces somewhat, not to anything

like the same extent as albumen, in addition, the prints are very vigorous, with much more detail; and a great advantage with many, especially amateurs, is the ease with which they may be glazed by squeegeeing down if the glass or ferrotype plate is properly cleaned, and French-chalked or waxed; and, although this is supposed by some people to be an "inartistic gloss," it gives the print an effect which is unattainable with any other paper, and, in spite of its defects (mostly in hot weather) I am not at all surprised that it has become so popular, for, if properly worked, it should prove more stable than albumen.

Collodio-chloride, which, although invented so far back as 1865 by the late Mr. G. Wharton Simpson, and sometimes called after him Simpson-type, has (chiefly by reason of the difficulties attending its manufacture) only come to the front during the last few years, approaches more nearly to perfection than any other printing-out paper at present in existence, as the working of it is not affected by the weather, the general results are better, the whites are purer, detail is much greater, it tones with very much less gold than the others, and, even when exposed to strong sunlight, is practically permanent.

The emulsion papers require slightly more care in manipulating than albumen, but this is amply repaid by the time saved in working; dirty fingers and dishes are the great enemies of emulsion papers, as it stands to reason that, the more sensitive the paper and the better the result, the more likely it is to be affected by dirt, and surely no photographer can find a reasonable excuse for either material or chemical dirt. Regarding the operation of printing, unless the negative is a good one, the final print can never be good; this is a point which is often overlooked, the paper and chemicals are blamed, where really the negative is at fault. In one case under my own notice, a complaint was made of inability to obtain pure whites, and of course the paper was blamed. I asked to look at the negative, and found it so thin, that it was actually printing where the high lights should have been; this thinness is often caused by the idea of being able to print so much quicker. To a certain extent this result is attained, but there is a limit which must not be exceeded. Good results are obtained by paying a little attention to the light, in printing, according to the negative, dense negatives printing best in the sun, while thin negatives come out better in the shade.

In printing, each of the above papers requires a slightly different treatment. Albumen requires to be deeply over-printed, with a decided tinge in the high lights, as it reduces so much in the subsequent operations; gelatino-chloride does not require to be printed quite so deeply, the high lights being only faintly tinged, while collodio-chloride should only be printed slightly deeper than the finished print is required, as it should lose very little in toning and fixing if the baths are in proper order.

A very common cause of failure is insufficient washing before toning; this is especially the case with the sulphocyanide bath, which is now almost entirely used for the emulsion papers.

The reason for the use of the salt bath (which is often recommended) does not seem to be understood very well, its use being where paper has not been sufficiently washed, to eliminate the free acids and silver which are nearly always present in these papers. The salt combines with the silver, forming silver chloride, which, of course, does not affect the toning bath, and is easily removed in fixing. The salt bath also tends to give a redder tone to the prints.

The toning bath should be tested for acidity, as very often commercial chloride of gold, and the acetates, tungstates, phosphates, sulphocyanides, &c., which are used as chloride absorbents, are very acid, and an acid toning bath causes a great reduction in the prints, especially with collodio-chloride. It is advisable to add a small quantity of bicarbonate of soda to the toning bath to neutralise it, more especially if, as is very often the case, the paper is insufficiently washed, to also neutralise the free acids, which otherwise would strongly acidify the bath. It may be thought too much trouble to see that the toning bath is not acid; therefore I would ask any one who thinks so to try and tone with a bath made purposely acid, place a print in, and note the great loss of density, probably spoiling it; then make the bath alkaline, place another print in, and observe the difference. I am quite sure that sensible photographers will not think it too much trouble again, as they will be able to trace the cause of many spoiled prints, should they not have already found the reason of this trouble. The time and trouble may be reduced to a minimum as follows: Most photographers, I presume, usually work with a standard-quantity bath, and if the amount of bicarbonate necessary to neutralise the average bath is once found, and a small measure (a spoon will do), holding the required quantity, is kept, all that would be required is to fill the measure with bicarbonate and empty it into the bath; not a great deal of trouble where it means the saving of prints.

Sometimes complaints are made of double toning with gelatino-chloride; this usually occurs from using a gold bath too strong, and the gold is deposited too rapidly and unevenly. Strong baths with gelatino-chloride have the advantage of toning quickly, but, as it is often at the expense of some of the prints, it is difficult to see where the advantage comes in.

The toning bath for collodio-chloride should never be very strong in gold, or great reduction in depth takes place, with poor, blue tones. I recommended an amateur to try collodio-chloride some time ago. He said he did not understand it, and asked how it was worked. I told him, the



same as working gelatino-chloride, only not to use too strong a toning bath. He said he always liked to use a strong one, which I told him was useless for collodio-chloride; however, he insisted upon using a strong bath, with, of course, the usual results of no density and blue tones, and, to make matters worse, kept adding gold, thinking to get the tone he required, where, in fact, he was getting farther away from it. He was very much disgusted with the result, which, of course, he put down to the paper, though it was entirely due to his own stupidity, for it is a well-recognised fact that collodio-chloride must *not* be toned in a strong bath.

In toning, gold deposited quickly gives blue tones, while that deposited slowly gives red ones.

The combined toning and fixing bath is an abomination which no photographer with any care for his work should tolerate, as, no matter how carefully it is worked, there is no certainty of knowing how much gold the bath contains, or if it contains any at all, as the sulphur in it will tone after all the gold is used. Fancy a combined bath made with a mixture of alum and h. po., as occasionally recommended, the chemical formulae for which are, respectively,  $\text{Al}_2\text{K}_2\text{ISO}_4 + 24\text{H}_2\text{O}$ , and  $2\text{Na}_2\text{S}_2\text{O}_3$ . What a grand chance of sulphur toning, and how would it stand for permanency? Always use distilled water in making up toning baths, it is a little more expensive to start with, but in the end is cheaper, when the spoilt prints and lost time and gold are taken into consideration.

In hot weather it is usually recommended to use an alum bath with gelatino-chloride, and, unless care is taken to thoroughly wash the alum away, trouble results. The less the hardening agents are used until the finish of the prints the better, as they tend to make the film impervious to the toning and fixing solutions.

Fixing should never be done with a freshly made solution of hypo. Firstly, because a newly made bath is very cold, therefore cannot act properly; secondly, hypo almost invariably contains some impurities, and always deposits sulphur if allowed to stand, and, should these instead be allowed to deposit upon the prints, they will tend to yellowness and fading. Unless the operator is in the habit of testing the hypo for acidity, it is advisable to add a small quantity of ammonia, as hypo is frequently acid, and many of the complaints of reduction to a large extent in fixing are generally traceable to acid hypo, besides which the acid helps the deposition of sulphur. The ammonia may be added in a similar way to that suggested for adding bicarbonate of soda to the toning bath. Always use at least one ounce of hypo to ten ounces of water, more rather than less, so as to form the soluble hyposulphite, or, more properly, thiosulphite of silver, which is easily dissolved away, instead of the insoluble one, which is obtained with very weak solutions of hypo, and do not fix too many prints with the same solution or fading is bound to ensue.

Toning and fixing proceed best when the solutions are at a temperature of about 65° Fahr. Where a little attention is paid to the above matters, I am sure that little or no trouble will be found with spoilt prints, loss of density, double toning, &c.

C. T. SUTTON.

#### WEISS'S SMOKE AND FUMES COLLECTOR FOR FLASHLIGHT PHOTOGRAPHY.

THE subject of this invention is an automatically working apparatus for collecting and enclosing the smoke and fumes generated through the igniting of the powder employed in the taking of instantaneous photographs. The essential feature of the invention is the arranging of a bag above the instantaneous light apparatus, this bag being in a collapsed state before the igniting of the flash powder, and leaving the lamp for the instantaneous lighting free, but after the ignition of the powder it unfolds automatically by means of the flame, and then encloses the instantaneous light apparatus, together with the smoke resulting from the ignition.

Figs. 1 and 2 show a form of the apparatus and its connexion with a lamp for instantaneous light, fig. 1 elevation illustrating the position of the apparatus before the igniting of the flash powder, and fig. 2 its position when actually effective, after the ignition, whilst fig. 3 is a plan view of a detail. Figs. 4 and 5 are sections of a slightly modified form of the apparatus.

The flash powder, 1, to be ignited lies on a table, 2, which is fixed on a stand, 3, 4. It is ignited, for example, by the forward motion of a carrier, 5, with a match, 6, the match being rubbed on a friction surface, which is not shown, and entering the body of the powder through an opening in the back, 7, of the table. The powder may, however, be ignited in any other manner.

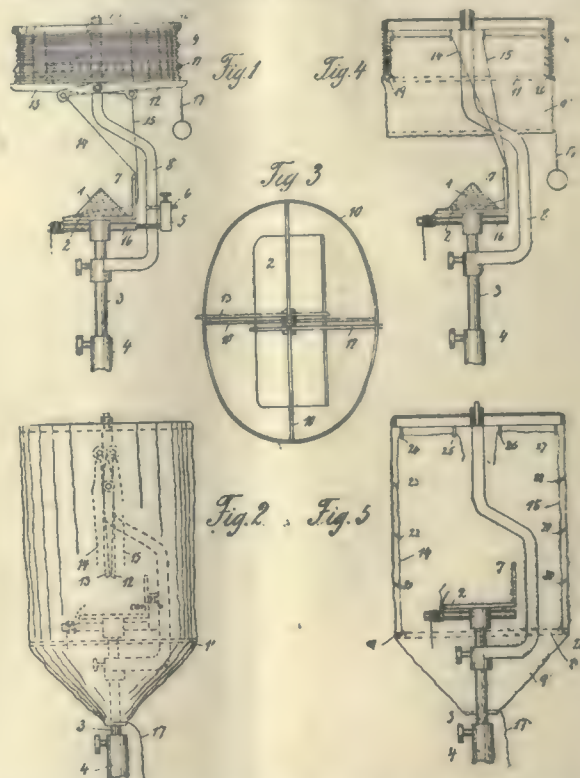
To the rod, 3, of the stand, an arm, 8, is fixed. This arm carries the smoke bag, which is open below and closed above. The bag-like part, 9, is placed over a frame, 10 (plan view, fig. 3), and has sewn into it a ring, 11. To the arm, 8, levers, 12, 13, are pivoted; these levers, when in their horizontal position, support and bear the bag, 9, in the collapsed or folded state (fig. 1). To the shorter ends of the levers, cords, 14, 15, are fastened, which are kept stretched and carried through the flash powder, or, in other words, through the area of the flame. In fig. 1 the cords, 14, 15, are carried through an opening in the back, 7, of the table, then through the body of powder, 1, or, in other words, through the area of the flame, and are kept stretched in any suitable manner,

for example, by being wound around the guiding sleeve, 16, of the carrier, 5. In this condition the smoke collector apparatus is ready for use.

If the flash powder be now ignited, and at the same moment the photograph be taken, the flame produced burns through the cords, 14, 15, so that the levers, 12, 13, lose their hold, and the bag, which is loaded or charged with the ring, sliding down from the levers, unfolds. Thereby, the lamp for the instantaneous light, and the ascending smoke will be entirely surrounded, and the latter completely intercepted, this latter operation being further effected by pulling the cord, 17, which serves for contracting the bottom of the bag.

Fig. 2 shows the apparatus in this position, in which the levers, 12, 13, assume a vertical position by their own weight after the cords are burned through.

In order to make the apparatus again ready for use, the separated cords are united again, or new cords fastened to the levers, 12, 13; the arm,



8, is arranged suitably adjustable on the rod, 3, of the stand; the frame, 10, is arranged on a pin, 18, in the upper end of the arm, 8, by means of a central socket. Having regard to the fact that the table, 2, is of a suitable lengthy (or oblong) form, it is advisable to make the frame elliptical, and the bag of corresponding shape.

Figs. 4 and 5 illustrate, in section, a simplified form of the invention, from which the levers, 12, 13, are absent. The cords, 14, 15, are, in this case, fastened to hooks, 19, 20, rove through eyes or loops, 21, 22, 23, 28, 29, 30, in the bag, and eyes or loops, 24, 25, 26, 27, on the cross stay of the frame, and further on as arranged in fig. 1. Fig. 4 shows the bag, 9, in the folded state, the lower part, 9<sup>1</sup>, hanging down free. When the cords, 14, 15, are burned through, the bag unfolds through the dropping of the ring, 11 (fig. 5), whereupon the lower part, 9<sup>1</sup>, is closed by pulling the cord, 17.

#### NOTES FROM THE WEST OF SCOTLAND.

JUDGING from the experience of a few of the professional photographers in Glasgow, installations of electric lights in studios are not being attended with the happiest results. In one instance especially, where a firm of photographers have gone to a considerable outlay in fitting up an installation of arc lamps for portraiture in their studio, it has been found that the current supplied by the Glasgow Corporation was so unreliable as to quite interfere with the proper conduct of the business of the firm.

Then, again, it is no secret that on more than one important occasion the voltage that was supplied by the Glasgow Corporation was quite inadequate to feed the customary arc lamps employed in an ordinary cinematographic display in the Royal Art Institute, and in another important function held in Glasgow Chief Public Halls, where it was desired to photograph a celebrated concert party, the installation of electric arc lights could not be brought into requisition at all.



The outcome of all this is a distinct leaning on the part of a few of our leading photographers to turn their attention to a form of illumination that is more under their own personal control, such as a well-appointed installation of acetylene gas.

The introduction of acetylene gas into our studios so far has been slow, but it can be safely asserted that, in all cases where such has been introduced, the same has been attended with the most successful results, and at the present time there is a distinct inclination on the part of photographers to adopt such in preference to the uncertainty of the arc light.

Some time ago we drew our readers' attention to an important action that was likely to come before one of the law courts in Glasgow, in which a local camera club was being sued for the alleged offence of taking and exhibiting a snap-shot of a dealer. This cause has now been brought into Court, and of which the following is a condensed report of the grievance alleged:—

"ACTION AGAINST A CAMERA CLUB.—A rather curious action is pending against the Shettleston Camera Club. A case has been intimated by Mr. Charles McKerracher, dealer, Gray-street, Shettleston, against the Shettleston Camera Club (Robert Anderson, M.D., President; William Gordon, Vice-President; J. S. Wilson, Secretary; and H. Gray, Treasurer, of the said Club). Pursuer alleges that some of the members of the Club took three snap shots of him while in the pursuance of his calling in the Old Edinburgh-road, and that said photographs were exhibited at a lantern entertainment given recently by the Club. He further alleges that through this cause he has suffered much loss of business and personal inconvenience. The sum of 150*l.* as damages is claimed as compensation. The Club have had a meeting, and agreed to defend the action."

A very interesting series of photographic demonstrations was recently given before the Glasgow and West of Scotland Amateur Association, by Mr. T. N. Armstrong. These, among other minor items, included some valuable hints on the application of the flashlight to ordinary daylight exposure, as well as what must be termed an exceedingly simple method of making lantern slides from large-sized negatives by reduction through the camera with the aid of an ordinary paraffin lamp. In these demonstrations Mr. Armstrong used, in connexion with the turning of magnesium powder, a novel form of lamp for which he claimed an illumination of any extent up to ten thousand candle power, according to the quantity of powder used. It certainly was a surprise to the large audience that assembled on the occasion to witness the wonderful light that was produced.

The chief points of interest in connexion with the production of lantern slides by reduction through the camera, when merely an ordinary paraffin lamp was used, seemed to lay in the employment of a portrait combination of lenses, in conjunction with a more than rapid grade of lantern plate which enabled a very brief exposure to suffice. Mr. Armstrong explained that he was indebted to Messrs. Cadett & Neall for supplying him with these excellent plates. The results achieved before a crowded meeting were certainly strikingly successful, for, with an ordinary tissue paper, diffusing screen exposures of three minutes yielded most exquisite results.

The developer used was plain pyro and ammonia, which was mixed in the presence of the audience.

Mr. Willie Anderson of Partick also showed his method of making vignettied bromide prints, and in this he used his newly designed vignetter which is most portable and effectual. Mr. Anderson not only exposed a large number of prints, but developed the same in the presence of the meeting, and was most successful throughout the entire series of demonstrations.

#### YORKSHIRE PHOTOGRAPHIC SOCIETIES: PROPOSED UNION.

A SPECIAL Meeting, convened by circular issued at the instance of the Secretary of the Bradford Photographic Society, was held at the Grammar School, Bradford, on Friday evening last, at 7.30 p.m., to consider the desirability of establishing a Union of Yorkshire photographers and photographic societies.

The meeting was the outcome of the success which has been attained by the Bradford Exhibition and to the friction which has of late arisen between the Yorkshire societies and the affiliation with the Royal Photographic Society.

In response to the invitation the following gentlemen attended the meeting for the respective societies:—

Bradford Photographic Society, Messrs. B. J. Appleton, J. Akam, J. Woodall, W. A. Bell, P. Lund, F. Nicholson, H. G. Rogerson, G. Thistlethwaite, and E. Clough (Secretary *pro tem.*).

Halifax Camera Club, Messrs. J. W. Holland, C. Foster, G. Bower, and J. Abbey.

Leeds Photographic Society, Messrs. J. C. Coultas, T. Carter, A. W. Atkinson, H. B. Buckley, and John Woolf.

Yeadon and District Photographic Society, Mr. — Coupland.

Batley Photographic Club, Messrs. P. Sheard (President) and W. H. Atkinson (Secretary).

Heckmondwike Photographic Club, Messrs. A. Senior and T. W. Rhodes.

Keighley Photographic Club, Messrs. Thomas Heaps, J. W. Gill, and S. Bairstow.

Leeds Camera Club, Messrs. J. H. Gash (Secretary), W. J. Warren (President), R. Bourke (Vice-President), W. Rust (Vice-President), and J. Skilbeck (Committee).

Rodley Photographic Club, Mr. J. F. Ashley.

Huddersfield Photographic Society, Mr. W. A. Beevers.

Wakefield Photographic Society, Mr. W. Woodhead.

Hull Photographic Society, Messrs. J. Hollingworth and — Johnson.

Sheffield Photographic Society, Mr. George W. Blackwell.

Mr. Clough at the outset remarked that they must not consider that at all in the light of a formal meeting; it was practically in the nature of an experiment.

On the motion of Mr. Appleton, seconded by Mr. Frank Nicholson, Mr. Lund (Bradford) was voted to the chair.

Mr. Lund, on taking the chair, said it seemed to him that some sort of union amongst the various associations in Yorkshire was desirable, and was clearly indicated by the representative attendance that evening. Of course, there were adverse views on the subject, and he called upon

Mr. Clough, who read a letter from the Rotherham Photographic Society, which was to the effect that that organization considered that the advantages to be gained by such a movement as they had now under consideration were no greater than those already provided by the Royal Photographic Society, at the same time it was necessary. He should say he had received a large number of letters, in which approval was expressed of the scheme. Of course, those letters simply expressed the opinion of various hon. secretaries, and was not binding at all upon the various associations.

Mr. Warren insisted that it was of vital interest the meeting should know what associations expressed approval of the scheme.

Mr. Clough intimated that ten secretaries or officials had expressed approval of such a union as was contemplated by the circular.

On the suggestion of the Chairman, Mr. Clough undertook to explain the objects for which the meeting had been called. There had, he said, for some time past been a desire among various societies in Yorkshire to exchange opinions as to the desirability of a sort of federation amongst the various societies in Yorkshire; and, so far as he could see, the feeling was spreading every day. The Yorkshire district was so wide, that it was felt an impossibility to proceed until a small informal committee took the matter in hand, and, with this end in view, eight gentlemen had taken the matter in hand. The whole object of the Committee had been to bring, if possible, the matter to a head. They, of course, had drawn up a scheme, but it must not be taken that any preference should be given to that as compared with the suggestions of any individual. The desire had been to found a basis on which discussion might take place. The Committee that had been engaged on the preliminary work consisted of Messrs. Appleton, Thistlethwaite, Akam, F. Nicholson, H. G. Rogerson, P. Lund, and A. E. Clough.

Mr. Clough then submitted the following draft scheme, as recommended by the Committee:—

#### YORKSHIRE PHOTOGRAPHIC UNION.

##### PROBABLE FACILITIES GAINED BY UNION.

1. Intercourse and exchange of opinion between one society and another.
2. United action for the purpose of exhibitions or dealing with any question of importance to photographers in the county.
3. Interchange of prints and lantern slides.
4. Interchange of lecturers and lectures.
5. Annual excursion.
6. Annual meeting to be held at different centres.
7. Special railway fares.
8. Competitions in different branches of photography.

The interchange of prints could be achieved by means of a circulating portfolio under the control of a special committee. The interchange of slides might be effected conveniently in the following manner:—

Each society to send to headquarters no less than a given number of slides. These are submitted to a selection committee, who make up from them one or more sets for circulation in the usual manner.

These slides, when the circuit is completed, to be returned to their owners. All breakages are paid for by individual societies. The interchange of lecturers might advantageously be carried out on the following lines:—

By the establishment of, first, a voluntary lecturing and demonstrating staff composed of men who would come and give (a) three evenings each season; (b) six evenings each season; (c) nine evenings each season. To these voluntary lectures no charge shall be made for admission. The society engaging a lecturer shall pay his travelling expenses, and, if circumstances render it necessary, his hotel expenses also, provided hospitality is not offered. Some such arrangement as the following should be established in order to regulate the demand and supply of voluntary lectures: All societies in the Union to be allowed two voluntary lectures each season, and, in addition to that fixed number, one extra lecture for each approved lecture placed by that society at the disposal of the Union.

Secondly, a paid lecturing staff, comprising duly approved and selected lecturers, residing either in Yorkshire or elsewhere, whom the Union consider desirable to have on their books, and who allow a special commission to the Union on all engagements.



As to the interchange of lectures, the Union might purchase each season one or more written lectures from qualified writers, which would be circulated among the societies in the Union in the usual manner.

9. Juries of selection.

10. A meeting of officials for exchange of lectures.

That questions of principle be taken up by the Union with railway companies.

That the Union arrange, if desired, and when possible, for privileges for working in private places of interest, i.e., places not open to the general public.

#### CONSTITUTION.

A President, six Vice-Presidents, Recording Secretary, Business Secretary, Committee, Treasurer, members, and associates.

Members may be either individuals who have joined the Union by paying a subscription of 5s. per annum, or delegate members elected by societies as their representatives.

All members of the Society who have joined the Union become associates, and are entitled to attend the annual excursion and the General Meeting. Photographers not members of any club may become associates on payment of 1s. per annum, or members on payment of 10s. 6d. per annum. Societies can enjoy the privileges of the Union on the following terms: Those having a membership roll of fifty or less, 10s. per annum; 15s. for those having 100 or less; and 20s. for all above that number.

These societies shall be allowed to send to the General Committee one, two, or three member delegates.

**General Committee.**—The individual or unattached members and the delegates members shall form the General Committee of the Union. The General Committee shall elect twenty-five of its number to form a Managing Committee. The Managing Committee shall be nominated a month prior to the General Meeting, and elected by voting papers sent to every member by post, to be returned five clear days prior to the annual meeting. The whole of the officers and Managing Committee shall retire annually, but be eligible for re-election. Associates have no vote. The Managing Committee shall elect the officers.

The Chairman pointed out that it was at the option of the members to revise the suggested scheme in every respect. Of course, if they decided on any scheme, a meeting would have to follow for the election of officers, &c.

Mr. W. Rust (Leeds) thought some reason should be given for the formation of the proposed combination.

Mr. Bourke (Leeds) was under the impression that there was already in Yorkshire a sort of society carrying out similar objects to those it was proposed the new organization should devote itself.

Mr. Hollingsworth (Hull) thought that their best plan would be to accept the draft scheme, and each delegate submit it to his Association for consideration. At a subsequent meeting they would have something definite to go upon.

The Chairman asked that some one should suggest that some such a Union as had been suggested was desirable; of course, if the meeting was against the proposal altogether, the whole thing fell to the ground.

Mr. Hollingsworth moved—"That the formation of a Union of Yorkshire Photographic Societies is desirable."

This was seconded by Mr. Carter (Leeds), and carried without opposition.

The Chairman thought it would be advisable to take the various items in the scheme *seriatim*.

Mr. Sheard (Batley) thought they had gone as far as they could that night, and suggested that the scheme as propounded by the Committee should be put in the possession of all the societies in Yorkshire, so that it might be duly considered. Of course, the expense of the circulation could be arranged amongst themselves. He moved a resolution to the effect.

Mr. T. Heaps (Keighley) seconded this.

It was agreed to defer the motion.

Mr. Rust again expressed his inability to discover any reasons which had been put forward for bringing the Union into existence.

The Chairman pointed out that the reasons were embodied in the draft scheme, and it seemed to him there was a general feeling in favour of it.

Mr. Bourke (Leeds) maintained that there was a body already existing in Yorkshire devoted to similar objects as suggested that night. In connexion with the affair a meeting was duly held in Leeds last year.

Mr. Appleton thought that the matter referred to by Mr. Bourke did not interfere with the present scheme at all.

Mr. Warren agreed with this view, maintaining there was a need for the proposed Union.

After further discussion, clauses 1, 2, 3, 4, 5, of the draft scheme were agreed to.

As to the Annual Meetings it was agreed to add to No. 6, "To be held in April at different centres."

Clause No. 7, as to special railway fares, brought about some discussion, the idea being that the resolution carried should allow members of the proposed Union, on production of cards of membership, to travel at reduced fares, such as maintained with regard to the Yorkshire Naturalists' Union and other similar societies.

As to No. 8, "Competitions with different branches of photography."

The Chairman remarked that it was impossible to foresee how far this

would go. Special awards might be given in connexion with important exhibitions.

Mr. Warren thought, in connexion with No. 9, the scheme might include an arrangement for registering Judges, so that in club competitions they would know where to apply.

The meeting considered Mr. Warren's idea a valuable one, the existence of something after the nature of a "judicial bench" being desirable, and it was decided to add to the item, "Election of a Judicial Bench."

No. 10 gave rise to considerable debate, and it was resolved to add to that item, "That questions of principle be taken up by the Union with railway companies."

As to the exchange of lectures, the Chairman said the idea was that the Union would have under its control all grades of lecturers, many of whom might be acceptable in small societies, but at the same time not able to take up a position at societies such as Leeds and Bradford. The best plan would be for each society to place its programme before the Central Committee.

Mr. Warren asked if it was seriously intended that no society, however influential, should have more than three representatives present at any committee meeting?

The Chairman said that was certainly the idea. It was not intended that the larger societies should dominate over the smaller ones.

It was ultimately decided to add the following items to the draft scheme:—

"Juries of Selection."

"A meeting of officials for exchange of lectures."

"That questions of principle be taken up by the Union with railway companies."

"That the Union arrange, if desired, and when possible, for privileges for working in private places of interest, i.e., places not open to the general public."

It was proposed by Mr. Sheard, and carried *nem. con.*—That an association with the title of the Yorkshire Photographic Union be formed, and that the provisional scheme as revised and approved be printed, and forwarded to the secretaries of every society in Yorkshire.

Mr. Warren was appointed Hon. Treasurer *pro tem.*, and the meeting adjourned to February 9.

#### PERTSHIRE SOCIETY OF NATURAL SCIENCE (PHOTOGRAPHIC SECTION) EXHIBITION.

For a first Exhibition by a young Society, or rather by a newly re-suscitated branch of an old Society, this Exhibition, opened on Wednesday, January 25, is a very creditable one. The manner in which the members have contributed to the confined classes shows an unusual amount of enthusiasm; to be critical, we might in some cases say their zeal had over-run their discretion, but it is so comforting to find so much whole-hearted enthusiasm that criticism on this point is stilled. In five members' classes we have 176 entries, the most popular naturally being the landscape, which totals sixty-nine entries, including many good things. The best work in the various members' classes is submitted by Messrs. W. Ellison and A. S. Nicol, the latter taking the silver medal for the best print exhibited in the members' classes with a photographic joke, entitled *A Study for a Saint*; the "saint," it may be stated, stripped of his surroundings, is simply a bare-footed youngster, staring benignly at the spectator. A few members have yet to learn that a white, blank sky is not true to nature, but the Exhibition should teach this. As might be expected from a sub section of a Society with the above title, scientific work is more *en evidence* than is usual at photographic exhibitions. Mr. R. Kidstone shows a number of micro photographs, clear in detail and of perfect technique; Mr. Charles Kirk has a series of views of birds' nests, some of which might well compare with those of Mr. Kearton; and Mr. A. S. Reid, M.A., exhibits some very good photographs of geological formation that will form a valuable help to geological students. *A Stencil Pattern by Photography*, by Mr. A. S. Nicol, is at once, suggestive and useful.

In the Open Classes the local men exhibit largely, but there are also entries from a wider area. Mr. W. Louis Primrose, Glasgow, in the Landscape and Seascape Class wins the silver medal with *The Brook*, a photograph which, while obeying the canons of composition, is wanting in some point of interest. Second place is taken by Mr. E. S. Lyttel, Glenalmond, with *Evening*, a rather indifferent interpretation of a hackneyed subject, a photograph with a similar title by Mr. W. F. Slater, Camberwell, being thought by many superior to the bronze medal print, but we understand the Judges were unanimous in their verdict.

In the Portraits, Figure, and Animal Studies, pride of place is taken by a local professional, Mr. John Spark, Perth, with *Faith*. The photograph may not, perhaps, quite carry out the title—the subject is an ambitious and difficult one—but it shows that even in the provinces there are professionals with a real love for their profession and a desire for some better than "the usual thing." A sunning down of the light on the drapery and the removal of an obtrusive arm would improve this photograph, while a quieter frame would considerably aid in securing the harmony of the whole. The bronze medal is awarded to *Pointers at Work*, by Mr. W. J. Croall, Edinburgh, a picture that secured much attention at the Glasgow International Exhibition of 1897 under the title of



*Sporting Dogs at Work.* In this class Dr. Fergusson, Cheltenham, shows a beautiful series of *Kitten Studies*, some of which figure in the catalogue as *Kitty Study*. Mr. W. F. Slater, Camberwell, shows his well-known *Pelican*, Mr. Alex. Geekie, Coupar Angus, has a really good thing in *Study of a Head* and *A Little Girl's Head*—a camera sketch is sufficiently away from "the usual thing" to be noticeable. Messrs. W. M. Warneuke and J. Craig Annan show a selection of their well-known works, and exhibits are forwarded from Messrs. G. H. J. Burrows and John Spark, Perth; Mr. A. F. Mackenzie; and the Art Photographic Company, Perth. The work of Mr. Mackenzie contains portraits of prominent men like Sir John Millais, Mr. W. E. Gladstone, &c., and should be seen by all who value first-class technique with a pleasing and artistic arrangement of the subject.

We ought to mention that admission to the Exhibition, which is held in one of Perth's best modern buildings, the Sandeman Free Library, is free, and the Exhibition should be a valuable education to the citizens of "the fair city," who are taking full advantage of the privilege offered.

Appended is the prize list. Judges: Messrs. W. M. Warneuke, Glasgow; J. Cox Cox, Loches; and William Fraser, Perth.

#### MEMBERS' COMPETITIONS.

*Landscapes and Seascapes, with or without Figures.*—Bronze medal, Mr. Henry Shields, *Evening, Loch Fyne*; certificate, Mr. William Ellison, *Autumn Scene*.

*Portrait, Figure, and Animal Studies.*—Bronze medal, Mr. William Ellison, *The Stocking-knitter*; certificate, Mr. Henry Shields, *Tommy*.

*Instantaneous Work.*—Bronze medal, Mr. A. S. Read, M.A., *Hurdle Race*.

*Architecture, interior or exterior.*—Bronze medal, *Interior of St. Paul's, Antwerp*; certificate, Miss M. Thomas, *Balmerino Abbey*.

*Flower Studies, Statuary, &c.*—Bronze medal, Mr. Charles Kirk, *Nest of Willow Wren*; certificate, Mr. A. W. Brown, *Grapes*.

*Lantern Slides.*—Bronze medal, Mr. Henry Shields; certificate, Mr. Harry Coates.

Silver medal for best in above classes.—Mr. A. S. Nicol, *A Design for a Saint*.

#### OPEN CLASSES.

*Landscape and Seascape.*—Silver medal, W. Louis Primrose, Glasgow, *The Brook*. Bronze medal, G. S. Lyttel, Glenalmond, *Evening*.

*Portrait, Figure, and Animal Studies.*—Silver medal, John Spark, Perth, *Faith*; bronze medal, W. J. Croall, Edinburgh, *Pointers at Work*.

*Lantern Slides.*—Silver medal, E. R. Bull, London; bronze medal, Graystone Bird, Bath.

*Apparatus.*—Silver medal, J. Lizars, Glasgow; bronze medal, C. F. S. Burrows, Perth.

At the opening *Conversations* Mr. Henry Coates (President) presided, and Mr. Charles Reid, Wishaw, delivered a lecture illustrated with his famous lantern slides. The Secretaries (Colonel Campbell and Mr. C. F. S. Burrows), with their Committee, deserve all credit for the successful outcome of their labours.

#### THE INTERNATIONAL PHOTOGRAPHIC EXHIBITION AT BIRMINGHAM.

We have received a proof prospectus from Mr. Welford of this Exhibition, which is to form part of the National Trades and Industrial Exhibition at Bingley Hall, Birmingham, from March 20 to May 13. Amongst the various classes we note one for beginners, and another for amateurs who have not previously gained awards. Ladies too are catered for, there being one class reserved to them, and, in addition, a special silver medal for the best work by a lady in any class. Although previously medalled work is not debarred, there is a Champion Class, but it is on new lines. The three best pictures in the whole Exhibition receive the champion medals first, then they are debarred from medals in the classes for which they may be entered. Mr. Welford believes this to be the first time that this has been done. All pictures, however, remain eligible for the special prizes, which are numerous, and consist of medals, hand cameras, and five cash prizes ranging from 5l. 5s. to 1l. 1s. The rules and regulations are very complete, and things are defined that are often left open to question. All the competitions except two are open to amateurs and professionals alike. The Judges are Messrs. Harold Baker, B. Child Bayley, and A. Horsley Hinton. In order to assist exhibitors as much as possible, Mr. Welford will arrange for the transfer of frames from the Birmingham Society's Exhibition, which closes on March 4, to Bingley Hall. He will also receive exhibits from the South London Exhibition, which closes on March 11, up to Tuesday night, March 14, provided their exhibitors can arrange for their being dispatched on the Monday from London. All other exhibits must reach him on the 11th. For the benefit of London exhibitors, he will accept frames unpacked at his offices in Chancery-lane up to Wednesday night, March 8; these will be taken to Birmingham, and returned to his offices at the close of the Exhibition at a charge of 6d. per frame. They must not, however, be packed in cases or boxes. As these conveniences must entail considerable extra work for Mr. Welford, we trust they will be

appreciated. In view of recent complaints as to receiving notice of awards, he also guarantees that a printed list of awards shall be posted to every exhibitor at the earliest possible moment. Full particulars are now ready, and may be obtained from Mr. Walter D. Welford, 19, Southampton-buildings, Chancery-lane, London, W.C.

#### KODAK, LIMITED.

THE First Ordinary Meeting of the shareholders of the above-named Company was held at Winchester House, Old Broad-street, E.C., on January 26, under the presidency of Sir James Pender, Bart., M.P., Chairman of Directors.

After the Secretary had read out the notice convening the meeting, the Chairman said that this was only the formal meeting required by the statute, and, as the Company had been so recently formed, they had no definite business to put before the meeting. The Company was registered on November 14, and, although they had until March 13 to hold the statutory meeting, the Directors thought it advisable to meet the shareholders as soon as they were in a position to report the completion of the purchase, and to give some information of the progress and prospects of the business. The purchase was completed on January 20, and, in anticipation of the completion, notices of the meeting were sent out. The Company was now in entire possession of the undertaking of the English Company, and the businesses in France and Germany, as well as of ninety-eight per cent. of the shares in the American Company. With regard to the issue of shares in November last, it was probably a matter of common knowledge that, although no part of the capital was underwritten or guaranteed, the shares issued to the public, when the Company was brought out, were largely over-subscribed. Shareholders would naturally desire to know how the combined businesses have prospered, and those who were also shareholders in the Eastman's Photographic Materials Company, Limited, have already been notified of the progress of the Company to the end of last September. He was now glad to state that the rate of increase in the sales for the first nine months of 1898 have been maintained throughout, and, further, that the profits for the whole year have been of an eminently satisfactory nature. Although the audit for 1898 was not yet completed, the accounts have been made up by the Company's accountants on the principle laid down by Messrs. Price, Waterhouse, & Company, and showed a profit of over 230,000l. For purposes of comparison, it might be stated that the profits for the year 1897 were 185,232l. That showed a very marked increase, and they would observe that it was a continuation of the steady increase that has been shown for several years. The sales and the profits have been annually increasing, and, with regard to the current year (1899) it would be seen, on the basis of those figures, that there would remain, after payment of the preference dividend, sufficient to pay a handsome dividend on the ordinary shares, and still leave a large sum for the reserve fund. With regard to last year's profits, they took the profits of the whole year in respect of the businesses in England, France, and Germany, subject to payment of twenty per cent. per annum to the shareholders in the English Company. The margin on that was greatly in favour of their Company. They were also entitled to ninety-eight per cent. of the profits of the American Company from October 1 last. With regard to 1899, he might inform them that it has been arranged that the dividends on Kodak, Limited, should accrue from January 1, 1899. Assuming that the profits for the present year were as good as those of 1897 and 1898, they proposed, as has been the custom in America, to pay dividends quarterly, so that they might expect the first interim dividend in April next. It was an engagement in the prospectus that was issued that the cash in hand and at the banks of the combined businesses on January 1, 1899, should not be less than 150,000l. As a matter of fact, the cash balances at the date mentioned exceeded 165,000l. An application has been made to the London Stock Exchange for a settlement and a quotation of the ordinary and the preference shares. Their business in every country where organized was doing well and increasing, and they still have enormous territory and fields to exploit. They have excellent new goods for 1899, to meet a keep ahead of every demand, and they were also opening new depôts, in fact one has been opened at Brussels. He could not conclude his statement without referring to the death of his colleague, Mr. George Dickman. Many of them would have been acquainted with him, and would know of his fine qualities without any word from the chair. As the most prominent officer of the old Company on this side, and one who did much to establish the business on a firm and sound basis, they must all pay Mr. Dickman's memory the tribute of their sincere esteem and admiration.

#### Our Editorial Table.

MESSRS. MORLEY & COOPER, of 70, Upper-street, Islington, N., are issuing a special list devoted to hand cameras, of which there are several illustrated and described. The three latest Kodaks are also mentioned in the list.



## THE BARNET EXTRA RAPID PLATES.

Manufactured by Elliott &amp; Son, Barnet, N.

Messrs. ELLIOTT have recently increased the rapidity of their favourite brand of Extra-Rapid dry plates, and, taking advantage of the dull weather experienced at the commencement of the present week, we sought the opportunity to subject the plates to practical trial in circumstances analogous to those prevailing in studio work. In other words we tried the plates on home portrait subjects and interiors, giving what we should regard as very short exposures. We were convinced from our experiments that the Barnet Extra-rapid plates possess a very high degree of rapidity indeed, and we have no hesitation in endorsing Messrs. Elliott's recommendation of them for photographing interiors and badly illuminated subjects. In the studio, too, they should prove invaluable. Under stress of purposely forced development the plates resisted any tendency to fog, and a careful examination of the deposit showed it to be singularly fine in the grain. Thus the Barnet Extra-rapid plates have a combination of good qualities which should ensure them a good run amongst all classes of photographers.

## DEUTSCHER PHOTOGRAPHEN-KALENDER, 1899.

Verlag der Deutschen Photographen Zeitung, Weimar.

This excellent publication will soon attain its majority, being now in its eighteenth year, and its usefulness has been considerably increased by dividing the present issue into two volumes. The first, in the form of a pocket-book, contains a diary, a collection of formulæ, tables, and other statistical information, selected with care to meet the wants of the professional photographer. The second volume is a directory, comprising lists of the German photographic societies, officers of foreign photographic societies, and a list of photographic dealers throughout Germany. The book should be on the shelves of every German photographer.

## CATALOGUES RECEIVED.

G. W. Wilson &amp; Co., Limited, 2, St. Swithin-street, Aberdeen.

From the renowned house of G. W. Wilson, of Aberdeen, we have received their latest issued descriptive list of sets of lantern slides. The number extends to several hundred, and for subjects there are cathedral, historical, castles, picturesque old towns, both at home and abroad, scenery, Bible history, science themes, and others too numerous for mention. The list should be in the possession of all those who appreciate a beautiful lantern slide. For providing such, Messrs. Wilson's name has long been a household word wherever the optical lantern is used. In a prefatory note Messrs. Wilson & Co. say they supply good slides and expect a fair price. They do not supply job lots; they do not make their slides from cheap magazine or newspaper woodcuts; and they do not pirate other makers' slides. Such a business policy deserves the utmost encouragement.

In view of stocktaking, Messrs. George Houghton & Son, of 89, High Holborn, are issuing a list of a few new and second-hand lenses, which are to be cleared at greatly reduced prices. This list will be forwarded to any of our readers on application.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, February 8, at eight o'clock. Members' Open Night.

LEEDS CAMERA CLUB CONVERSATION.—The Leeds Camera Club had their Annual Conversations, on Wednesday evening, January 25, at the Alexandra Hall, about 250 of the members and their friends being present. A reception was held by the President (Mr. W. J. Warren) and Mrs. Warren, and Mrs. Warren afterwards distributed the prize medals to the various winners. The winning prints were on view during the evening. Among the numerous attractions provided by the Committee was the Kromskop, exhibited by Mr. Fox; a series of microscopical exhibits by Messrs. Gash, Birch and Fox; a demonstration of flashlight photography by Mr. Homburg and Mr. Morfitt; a Röntgen demonstration by Mr. J. H. Gash, lantern and cinematograph by Mr. R. Burke, interspersed with songs and music, under the arrangement of Mr. Palliser. Mr. Eastman gave a display of telephonic apparatus, a very enjoyable evening concluding with a Christmas tree distribution to every child present, under the arrangement of Mr. and Mrs. J. H. Gash.

THE NORTHAMPTON PHOTOGRAPHIC EXHIBITION.—This Exhibition will be held in the Assembly Rooms, Town Hall, Northampton, from Thursday, February 16, to Thursday, February 23, 1899. The Open classes are: (a) Open to professional and amateur photographers residing in the town and county of Northampton only:—Not previously medalled: 1. Portraiture and Figure Studies, including Animals; 2. Landscape, Seascape, and River Scenery; 3. Architecture, interior and exterior; 4. Hand-camera Work (direct pictures only); 5. Lantern Slides (sets of four). (b) Open Classes:—6. Champion Class, Pictures which have previously received an award at any exhibition. Not previously medalled: 7. Portraiture and Genre Studies and Animals; 8. Architecture, interior and exterior; 9. Hand-camera Work (direct pictures only); 10. Landscape, Seascape, and River Scenery; 11. Lantern slides (sets of four). Entry forms and further information can be obtained from the Hon. Secretaries, Messrs. E. J. Felce, 53 Adams' Avenue, Northampton, and E. G. Holt, 35, Ivy-road, Northampton. The date for receiving entry forms has been extended to February 6.

RÖNTGEN SOCIETY.—The next General Meeting will take place on Tuesday, February 7, at eight p.m., at 11, Chandos-street, Cavendish-square, London, W., under the presidency of Mr. C. W. Mansell-Moullin, M.D., Oxon, F.R.C.S. Mr. Wilson Noble will read a paper on a modified form of Toepler mercury pump. There will be a discussion on the Röntgen-ray photography of soft tissues, introduced by the President.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION ANNUAL EXHIBITION.—At the Grand Assembly Rooms, Barras Bridge, Newcastle, an Exhibition of photographic work, was held on Monday week, the exhibits comprising the work of members sent in for the competitions of the Newcastle and Northern Counties Photographic Association, and a loan collection by the principal workers of the day. The standard of work shown was high, pictorial merit and technical skill being very conspicuously combined in most cases. The list of awards for the members' competitions is as follows:—Set of three landscapes, bronze medal, Mr. W. S. Corder, North Shields. Set of three architectural subjects, bronze medal, Mr. A. Cowling, South Shields. Set of hand-camera pictures, bronze medal, Mr. J. Rhagg, Newcastle. Set of lantern slides, bronze medal, Mr. G. B. Bainbridge, Newcastle. Enlargements, silver medal, Mr. A. B. Gardner, Newcastle; bronze medal, Mr. Burton Graham, Whiteby. Portraiture, silver medal, Mr. Andrew Peddie, Durham. Stereoscopic pictures, silver medal, Mr. H. G. Ridgway, Sunderland; bronze medal, Mr. W. H. Nixon, Newcastle. Messrs. P. M. Law, Newcastle, and R. Hauxwell, Durham, were the Judges. At the opening ceremony Mr. J. P. Gibson presided, and amongst those present were the Rev. Principal Gurney, Mr. Edgar Lee (President of the Association), Mr. Fred. Park, Mr. Cowan, Mr. J. S. B. Bell, Mr. John Watson, and the Hon. Secretaries, Mr. W. Thompson and Mr. Parker Brewis.

## Meetings of Societies.

## MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
6.....	Barnet and District .....	Demonstration: Development, &c. T. McWalter.
6.....	Kingston-on-Thames .....	Lecture. Rev. F. C. Lambert, M.A.
6.....	Putney .....	Development and Toning Solis Paper. The Eastman Company.
6.....	Richmond .....	A Walk through Old Kingston. W. F. Hodgson.
6.....	South London .....	Hand-camera Work. W. Thomas.
7.....	Boyle .....	Prize Slides.
7.....	Gospel Oak .....	The Photographic Plate. J. E. Rayner.
7.....	Hackney .....	Lantern Evening: A Trip to Ta-moath.
7.....	Isle of Thanet .....	Annual Lantern-slide Competition and Exhibit on.
7.....	Lewisham .....	Demonstration of Trimming and Mounting Prints and Cut-out Mounts. H. L. Davis.
7.....	Rotherham .....	Lantern Slides. John H. Hodges.
8.....	Croydon Camera Club .....	Ninth Annual Meeting.
8.....	Leeds Camera Club .....	Chemicals used in Photography. B. A. Burrill, F.I.C.
8.....	Photographic Club .....	Members' Open Night.
8.....	Southport .....	Lantern Work. D. E. Benson.
8.....	Southsea .....	Annual Dinner and Smoking Concert.
9.....	Darwen .....	Demonstration: Carbon. T. H. Hayes.
9.....	Liverpool Amateur .....	Printing Processes for Pictorial Purposes, with a Demonstration of some Special Printing Methods. A. Hooley.
9.....	Oldham .....	Prints in Yorkshire. T. Burton and T. W. H. Lton.
9.....	Woolwich Photo. Society .....	Elementary Photographic Optics. R. Child Bay-ve.
10.....	Croydon Microscopical .....	Peak of D.aphyria, with Lantern Slides.
10.....	Leeds Photo. Society .....	Annual Dinner.
10.....	Plymouth .....	Members' Lantern Night.

## LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 26.—Mr. J. S. Teape in the chair.

Mr. T. E. H. BULLEN, referring to his paper on development of printing-out paper, delivered last week, said the question had been raised as to the possibility of getting uniformity of tone by development. He now showed several cards bearing, some of them, six prints of the same negative, and others three prints, made by the development process, all of which were particularly uniform in tone and depth of printing, indeed superior in these respects to much of the ordinary professional work. While these prints showed the possibility of securing them a uniform batch, an important factor in the attempt was the use of one brand of paper and one developer for the different prints which it was desired should resemble one another. Any toning formula, Mr. Bullen had reason to believe, would answer with prints developed by the method described, provided that a thorough washing in water followed the salt bath to which the prints were subjected after development.

Mr. LEWIS MEDLAND brought up a number of slides, taken in the pre-kina-matographic days, to show the many diverse phases of movement in horse racing, leaping, sports, the flight of birds, &c. The exposures in many instances were so short as one five-hundredth of a second, effected with Newman & Guardia's Celeritas shutter, and the several pictures brought before the members evoked a large share of appreciative remarks.

Mr. T. E. FRESHWATER exhibited a series of slides from photographs of the stuffed birds and animals in the collection at the Natural History Museum at South Kensington. All the specimens had to be photographed through the glass sides of the cases, and the success of Mr. Freshwater's efforts to avoid reflections in so doing was the subject of some comment. He said that the



photographer attempting this class of work was confronted with difficulties which exercised all the skill of the operator. There were many bright points to be avoided, reflections from the lens mount, bright screws on the camera, &c., and surrounding objects. He made use of a large black cloth (with an aperture for the lens to poke through), which he carried right up on some support to keep off these reflections. The background was a plain tinted grey brown material, with a white back, giving one the option of two surfaces. There was plenty of light, which sometimes had to be moderated by drawing the blinds. The exposures, with a lens stopped down somewhat, ran very often into minutes. A few of the slides were tinted, and all of them very interesting.

Mr. and Mrs. Welford and Mr. Bullen also contributed a selection of work—Convention pictures, landscapes and flowers.

#### PHOTOGRAPHIC CLUB.

JANUARY 25.—Mr. Lewis Medland in the chair.

Mr. R. CHILD BAYLEY gave a lantern lecture, entitled

#### THE HAND CAMERA AT HOME AND ABROAD,

in his usual bright and humorous way. Particularly interesting, on account of their present rarity, were the pictures of Spitzbergen, visited the year before last, which gave a very good idea of the features of this island, although to be able to appreciate the degree of colouring in the icebergs and glaciers nothing short of a visit would suffice. The remaining pictures covered the Norwegian coast between Bergen and Hammerfest as seen on a trip amongst the fjords, and included the results of a trip up the Rhine and Moselle, whilst the home subjects centered in the shipping at Ramsgate and the neighbouring district. The lecture was fully appreciated.

**Croydon Microscopical and Natural History Club, and Photographic Section.**—At the Twenty-ninth Annual General Meeting of this Club, held on January 17 last, William Whitaker, Esq., F.R.S., P.G.S., was elected President, and the following gentlemen form the general Committee, i.e., Messrs. J. H. Baldock, F.C.S.; J. Epps, jun., F.Z.S.; H. D. Gower; A. J. Hogg; G. E. Newby; E. J. Platts; E. Pierce, and N. F. Roberts, F.G.S. *Hon. Secretary:* R. F. Grundy. *Librarian:* A. Roods, F.S.I. The Photographic Committee comprise the following members: Messrs. J. H. Baldock (Lanternist and Recorder), H. D. Gower, E. Pierce (Hon. Secretary), E. J. Platts, A. Roods, C. J. L. Russell, and A. Weightman. The outgoing President, Dr. Hobson, then read the annual address, reviewing the work done by the Club, and its various sections during the past year, and which will be published in the *Transactions of the Club*.

**Birmingham Photographic Society.**—January 24.—Mr. HAROLD BAKER gave a demonstration of

#### BROMIDE PRINTING.

In his opening remarks Mr. Baker expressed surprise that bromide paper was not used more, as the variety of papers now upon the market made it possible to produce good prints from almost any kind of negative, and a variety of tones could be produced by soaking in a hot solution of alum and hypo, and other methods. The great cause of failure, he considered, was due to using a deep ruby light to develop by instead of a plentiful supply of yellow or orange. In some cases it was advantageous to judge of the necessary amount of development required by looking through the print in the same way as in development of negatives. It was advisable to cover the front of the printing frame with tissue paper in order to diffuse the light, and so prevent any small scratches or bits of dust that may be on the back of the negative showing as white marks upon the resulting print. With small prints it was advisable not to soak the paper in water before developing, but to put straight into the developer. If prints are previously soaked in water it very often leads to uneven development. Referring to warm tones, Mr. Baker preferred to dry his prints before putting them into the hot alum and hypo toning bath, as the risk of frilling was much reduced by so doing.

## Patent News.

THE following applications for Patents were made between January 16 and January 21, 1899:—

**PHOTOGRAPHY IN NATURAL COLOURS.**—No. 944. "An Improved and Simplified Method of taking Photographs in Natural Colours." A. LANDER. **PRINT AND PLATE-WASHER.**—No. 959. "Photographic Print and Plate-washer." G. A. CARRUTHERS.

**OPTICAL PROJECTION.**—No. 993. "Improvements in or relating to Optical Projection Apparatus for Advertising and Other Purposes." W. L. CAMPBELL.

**DEVELOPING AND FIXING APPARATUS.**—No. 1015. "Apparatus for Developing and Fixing Photographic Films and Plates." Communicated by R. Fleischer. A. M. CLARK.

**PRINTING.**—No. 1129. "Improvements in Printing by Photography." A. M. BARNES and E. COWPER.

**CAMERAS AND ENLARGING LANTERNS.**—No. 1130. "Improvements in Cameras and Enlarging Lanterns." A. M. BARNES and E. COWPER.

**PROJECTION APPARATUS.**—No. 1132. "Improvements in connection with Photographic Enlarging or Projection Apparatus." A. M. BARNES and E. COWPER.

**FINDERS.**—No. 1162. "Improvements in Photographic Finders or View-meters." J. E. THORNTON and C. F. S. ROTHWELL.

**FLASHLIGHT.**—No. 1388. "Producing Flashlight for Photographic Purposes." F. W. EMUSS and M. P. PROUT.

**CAMERAS.**—No. 1471. "Improvements in or relating to Photographic Cameras." G. W. BASE.

#### FORTHCOMING EXHIBITIONS.

1899.

- February 4-25 ..... Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, 2, George-street, Edinburgh.  
 ,, 13-18 ..... Photographic Society of Ireland. Hon. Secretary, 35, Dawson-street, Dublin.  
 ,, 16-23 ..... Northampton. E. J. Felse, 53, Adams-avenue, Northampton.  
 ,, 21-24 ..... Hastings and St. Leonards. Exhibition Secretary, A. Brooker, 21a, Wellington-place, Hastings.  
 ,, 23-25 ..... Woolwich Photographic Society. Hon. Secretary, F. W. Machen, 161, Griffin-road, Plumstead, S.E.  
 ,, 27-March 4. Birmingham. C. J. Fowler, Court Mount, Erdington, near Birmingham.  
 March 4-11 ..... South London. Hon. Secretary, A. E. Allen, 27, Princes-square, Kennington Cross, S.E.  
 ,, 20-May 13 ... National Trades and Industrial Exhibition, Bingley Hall, Birmingham. George Stanley, Manager.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### PLATINOTYPE PRINTING.

To the EDITORS.

GENTLEMEN,—In reply to Tom Reveley and others, re platinotype printing, having had many years' experience, I am of opinion that all difficulties with respect to mealiness, lines, &c., will be surmounted by using distilled, not merely boiled, water. This is only necessary for making developer, and can be procured at any decent chemist's establishment.—I am, yours, &c.,

W. COLES.

Grasmere, Acock's-green, Birmingham, January 24, 1899.

To the EDITORS.

GENTLEMEN,—I have noticed correspondents' complaints in the last two issues of the JOURNAL re the platinotype paper. Having had many years' experience with the platinotype process, I think that I shall not be out of place in giving my opinion. At different times I have had much trouble with the different papers supplied by the Platinotype Company, but, by thorough investigation, have found the cause of the trouble, and almost invariably have found it faulty manipulation on my part. Printers are, as a rule, only too ready to blame the Company for supplying bad paper when they are really themselves at fault. Employers are also often just as ready to blame the printer; but there are, undoubtedly, occasions when paper is to blame for the faulty result, and in such case it is hard that the printer should suffer.

My belief is that the mischief may occur either in the sensitiser, or, most probably, in the dressing of the paper before sensitising. Several printers, to my knowledge, are having the same trouble with the paper that your correspondents complain of; in fact, only a few days ago I had a print given me with exactly the same marks and lines, &c., as described by correspondents.

I enclose a piece of platinotype paper, that you may see for yourself the result.—I am, yours, &c.,

H. ANDREW.

166-8, Strand, London, January 24, 1899.

[At page 68 of the present number of the JOURNAL there is a short article by Mr. H. W. Bennett, one of our leading photographers, who has had a long experience in platinotype printing, which draws attention to the most probable causes of the failures with that process of which our correspondents have been complaining during the last few weeks.—EDS.]

#### ABOLISHING THE DARK ROOM.

To the EDITORS.

GENTLEMEN,—I among many others, doubtless, was much interested in Mr. Howard Farmer's account, published in your issue of January 20, of his method of illuminating a dark room.

He has, however, left out the cream of the whole matter, namely, the composition of the liquid light filter, and the illustration is not as clear as it might be.

Is the lamp, A, shaded on three sides, and only throwing light down through the light filter?

If so, why not put a gas flame immediately over the light filter, C, with a ventilated cover over it?



If you could give more information on these points in an early issue, you would much oblige.—I am, yours, &c.,  
January 26, 1899. A GROPER IN DARK-ROOM DARKNESS.

In the discussion that followed the reading of his paper Mr. Farmer stated that at present he could not divulge the nature of the colour-filter solution. The construction of the lamp is as our correspondent describes it. As to his suggestion to place the flame over the light filter, possibly he had better address Mr. Farmer, at 209, Regent-street, on the subject. He may have some reason not given in his paper for the particular form of construction adopted.—[Eds.]

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

E. F. Field, 5, Albion-place, Maid's-tone.—Photograph of Eleanor Marx Ave'ing.

W. H. Dodgson, 16, Henry-street, Blackburn.—Photograph of "Big Sea Breaking on Poard."

Lovell, 27, Wellington-row, Whitehaven.—Two Photographs of J. Blinkin'op, Postman, Whitehaven.

F. Coghlan, 31, Carlisle-road, Londonderry.—Three Photographs of Count Arthur Moore, Unionist Candidate for Derry City.

RECEIVED.—X. Y. Z.; C. B.; F. J. WRIGHT. These and others in our next. STUART.—The first-named.

PYRO.—We are sorry to say we have not retained the address.

C. H. CHASE.—We believe so; but you had better make further inquiries through a commercial channel.

WEST RIDING PHOTO-ENGRAVING COMPANY.—Messrs. Morgan & Kidd, of Richmond, S.W., undertake such work.

PLATINO.—Thanks for your letter. What has been published in this and our previous issue sufficiently meets the case, we think.

A. E. S.—We should be inclined to think that the water you use is slightly contaminated with iron. That would produce the markings.

UNO.—We do not think the firm named would be likely to receive a pupil. Possibly the London Stereoscopic Company, 54, Cheapside, E.C., would.

R. RICHMOND.—The Science and Practice of Photography, by Mr. Chapman Jones, published by Messrs. Hiffe, St. Bride-street, E.C., would meet your case. It could be carried in the coat pocket.

W. S. WALTERS.—1. Dissolve one ounce of potassium bromide in nine ounces one drachm of water, and you have it. Messrs. Percy Lund & Co., Bradford, publish a little book on the subject by Mr. Bool.

GAS BAGS.—B. EVAN. If the gas bags have been lying by for many years and become so very hard, and, when softened before the fire, show many leakages, we should say they are perished and cannot be effectually repaired. Though the price asked for them is low, we are inclined to say, from the description, that they would be dear at any price at all.

CRYSTOLEUM.—A. M. SMYTHE says: "I should be much obliged if you will kindly inform me where I can obtain paints and instructions for crystoleum painting."—There used to be a Crystoleum Company in Regent-street that taught that kind of colouring, and supplied the necessary materials, but whether it is in existence now or not we are unable to say. The so-called crystoleum painting practically died out some time ago, and we doubt if any one practises it now. Ordinary colours, as supplied by artists' colourmen, are all that are necessary. The method has frequently been described in our back volumes and ALMANACS.

STEAMING SLIDES.—R. NORRIS complains that he is troubled with his slide becoming covered with moisture when put into the lantern. He says: "I hired a number of fine slides to show at an evening party, and directly one was put into the lantern it became covered with dew and quite spoilt the show. I have never seen this at public entertainments. How is it avoided?"—The reason was that the slides were cold, and the moisture in the room, heated by the lantern, condensed upon them. If the slides are kept in a warm place for a few hours before the show, so that they become warm, no moisture will condense upon them; thus the trouble will be avoided in the future.

PLATINOTYPE.—H. B. COLLIS asks: "Can you tell me what is the matter with enclosed platinum print? It was finished and produced in the usual manner, as far as we know, and has since been in a frame, and has become, as you will observe, very much eaten away in some manner. Can you account for it in any way?"—We cannot, as we have never seen the like before. It looks very much, however, as if moisture had been in the frame, and the print pressed on the glass and then become dry and cemented to it, so that, when separated, portions adhered to the glass. That is the only suggestion we can make, and it is noteworthy that the paper where there is no image is also affected.

SPOTTY PRINTS.—T. J. writes: "Enclosed you will find two photographs, which I shall be pleased to have your opinion in reference to the fading of one. This has been done about four years. I have prints done at the same time on other mounts, and not mounted quite as good as the one sent just done. Do you think it is the cause of the mount, or the fault in the fixing and washing? I have photographs done by me twenty-five years ago, as good now as when they went out. I shall be obliged if you will give me your opinion."—It is impossible to say definitely the cause, but it looks more as if the fault lay with the fixing than with either the mounts or the washing. We form this opinion from the appearance of the small spots and the general fading of the image.

GRANULARITY IN ENLARGEMENTS; FORMULÆ.—ARGUS S. CROYLE asks: "1. Will you be good enough to inform me of the best means of avoiding the appearance of 'grain' when making enlarged negatives? I find that using photo-mechanical plates for the transparencies and ordinary plates for the enlarged negatives the grain is very conspicuous. 2. Also would you be good enough to inform me where I can find Mr. Wellington's formula for developing, intensifying, and fixing in one operation; and what proportions of silver solution, hypo, and bromide to use in making Mr. Bolton's developer for the same purpose?"—1. There should be no conspicuous grain shown in this method of working beyond that existing in the original negative. If that be granular, of course the grain will be magnified in the enlargement, and the greater that is the more conspicuous it will become. It may, however, be somewhat mitigated by making the enlarged negative very slightly out of focus. 2. See Mr. Bolton's article in last week's JOURNAL.

VARIOUS.—ROBERT J. BENGHIAT (Smyrna).—As I find "Correspondence" the most important article in THE BRITISH JOURNAL OF PHOTOGRAPHY, I beg you to give me some hints on the following: 1. What must I do to prevent the cracks caused to albumen prints, when covered with water colours and dried? 2. To what does the index on the sixth page of the SUPPLEMENT TO THE BRITISH JOURNAL OF PHOTOGRAPHY of the second number refer? 3. What is the easiest way to prepare "flexible supports" for using as collotype plate? How to make the film? And please tell me the proportions for the preparation in Continental Weight System? 4. What is the use of the formula under the name of "Dusting-on Process" mentioned on page 180 of the ALMANAC?—In reply. 1. Use less gum with the colours. 2. The index to the volume for last year. 3. Parchment paper is sometimes used as a flexible support in the collotype process. We should advise you to get Schnaus's work on the collotype process, which you can obtain from Penrose & Co., Upper Baker-street, W.C., as space is too limited to describe processes. 4. To produce pictures by the dusting-on or powder process.

CARBON C.C.—J.A.H. says: "Thanks for reply in answer to my query in your Answers to Correspondents' column. I wish to ask you a few other questions, if you don't mind answering them in the same manner, viz:—1. I have printed a lot of carbons from Elliott's tissue single transfer process without the safe-edge, and I have had no frilling at all, nor any signs of any. Can you explain this, as the makers say it is imperative you should have it? Would it have made any difference if it had been double transfer? 2. There was an advertisement in your paper the other week which ran: 'Wanted, printer, to print C.C. and platinum.' In this instance what would C.C. mean, as it could not mean platino-type paper? 3. What is the difference between gelatino-chloride paper and collodio-chloride paper. 4. Give me the names of some collodio-chloride papers and makers' names?"—1. You were fortunate, but probably there were too deep shadows at the margins of the prints. Had you been working by the double transfer method, the result might, however, have been different. 2. Collodio-chloride paper was meant. 3. In the one case gelatine is the vehicle holding the silver chloride; in the other it is gelatine. 4. The Paget Dry Plate Company, and some comes from Germany.

REVERSED NEGATIVES.—DUDLEY KIDD says: "I am sorry that I did not give you my name and address last week, but it was unintentional and the result of an oversight. To save you the trouble of turning to my previous letter, I may state that I wanted to know where I had gone wrong in trying to get reversed negatives according to the plan suggested, I believe, by Bolas. I have taken ordinary dry plates and sensitised them in bichromate of potash solution of strength varying from one ounce to the pint down to half a drachm to the pint, and, after drying in the dark, have exposed these plates under a negative of medium printing density to light. The exposure has varied from a few minutes in the shade to hours in sunshine, in all cases seeing that an image was visible at the back of plate. In some cases only a faint image was produced, in others a deep effect. The bichromate was washed out under the tap for a few minutes, and in some cases even up to twenty-four hours' washing was given in frequent changes of water. The washed plates were then exposed to light, in some cases after drying and in other cases without a preliminary drying. The exposure was varied from a few seconds up to hours. The developer used after this was pyro-soda, pyro-ammonia, rodinal, and metol. Yet in no single case could I get sufficient density without a veiling of the parts of the negative which should have been clear. In no case could I get a printable negative. I forgot to mention that the plates were soaked in the bichromate solution for a period varying from a minute to five minutes. Would you kindly let me know (1) where I have gone wrong; (2) where I can get a full account of the process?"—1. You seem to have exposed the plates to light after the image was printed, and also not partially removed the bichromate before drying as directed by the author of the method. 2. Mr. Bolas described the process in a paper he read before the Photographic Society, June 8, 1880, which will be found on page 376 of our volume for that year.



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## EX CATHEDRÂ.

THE Annual General Meeting of the Royal Photographic Society will be held at the Society's Rooms at eight p.m., on Tuesday, February 14, 1899, when the Report of the Council and the Treasurer's accounts will be submitted to the members, and the result of the ballot for the election of officers and Council will be announced. General business also will be transacted.

\* \* \*

THE balloting paper for the election of officers and Council of the Royal Photographic Society for 1899–1900 was issued last week. As it reached us simply in right of membership of the Society, we do not feel justified in publishing it *in extenso*, and we trust to find that we are not alone in treating the document as a private one. Many things concerning the internal management of the Society have from time to time found their way into print, and not only has this failed to operate to the advantage of the Society, but offence has been given by the publication of proceedings which have been rightly looked upon at the time as inadmissible for mention in the columns of

the press. For these reasons we simply content ourselves with a repetition of the recommendation, already given for the guidance of members at a distance, to vote for those of the old Council who are standing for re-election plus those nominees who, of the remaining candidates, have received the largest number of nominations.

\* \* \*

A GLASGOW correspondent informs us that there is considerable local dissatisfaction with the arrangements for the Photographic Section of the Glasgow International Exhibition of 1901. The constitution of the Photographic Committee, we learn, is giving widespread dissatisfaction, and already the West of Scotland Amateur Photographic Association have decided to have nothing to do with the Exhibition. It looks, adds our correspondent, as if there were going to be too much "Linked Ring" about the Exhibition, and he is of opinion that a mistake was made in appointing a professional photographer as Convener of the Committee—a post which ought, he thinks, to be given to a non-professional photographer, as was the case in 1888. There is already a distinct feeling, he tells us, that any one desirous of photographing inside the Exhibition buildings should be allowed to do so on payment of a nominal fee for the privilege, and that no sole right should be let to any one in particular, and in his opinion this will be a sore and difficult point to settle. It is to be regretted that dissatisfaction with the proposed arrangements for the Photographic Section has manifested itself; on the other hand, the circumstance that two years have to pass before the Exhibition will be opened supplies plenty of time and opportunities for the removal of all causes of local discontent. It is to be hoped, in the interests of the adequate representation of photography at what promises to be a great Exhibition, that harmony of feeling on the subject will shortly prevail.

\* \* \*

WE are informed that a meeting is to be held on Tuesday, February 21, at four o'clock, at the Midland Grand Hotel, St. Pancras, of a few friends who are interested in the ancient and decaying buildings in and around London, with a view to discussing informally the possibilities and best methods of securing pictorial photographic records of these objects of historical interest (which are constantly changing and dis-



appearing) to add to the National Photographic Record collection at the British Museum. Sir J. Benjamin Stone will be in the chair.

\* \* \*

Two more serious accidents have to be placed to the debit account of acetylene. The first occurred on the 31st ult. at a colliery near Ashby-de-la-Zouch, where, as the result of an explosion, the roof of the building containing the gas plant was blown out and the place wrecked, the man in charge of the gas plant being instantly killed. The second accident occurred on Thursday, February 3, at the brickworks of Messrs. C. J. Sanders & Co., near Chesterfield, and by which Mr. W. F. Richmond, M.I.M.E., of the firm of Richmond, Stockton, & Co., Staffs, and a workman were injured. It appears that, for the purpose of working night shifts, a large acetylene gas-making plant was being installed by Messrs. Richmond. On Thursday night an awful explosion occurred within the gas-holder, the great iron apparatus being hurled aloft, tearing away in its course the whole of the roof and iron-work above. The huge iron tank, roof, and other portions of the machine and building were blown thirty feet into the air. Mr. Richmond and a workman were buried beneath the fallen ruins, sustaining injuries to the head and shoulders, not, however, of a serious nature. Eight or ten other persons had narrow escapes. The accident is described as a remarkable one, as the gas-holder had been emptied as far as practicable, and the view of the vast column of white flame extending skywards, accompanied by the falling *débris* and water, is described as a beautiful though terrible sight. The new illuminant has already exacted a heavy toll in lives since its introduction a few years ago, and the accidents it has caused probably outnumber those from the use of compressed gases, which have been employed for a variety of purposes for a much longer period.

\* \* \*

WITH reference to our remark last week that the new Langfrier studio in Bond-street was probably the only one in London having a lift for the convenience of sitters, Mr. Fall, the well-known photographer of Baker-street, kindly writes to remind us that there are several London photographers having elevators on their premises—The London Stereoscopic Company, Regent-street; Messrs. Barraud; Messrs. Walery. Mr. Fall adds the interesting item of information that, generally speaking, visitors prefer stairs to lifts.

\* \* \*

MESSRS. ELLIOTT & SON, of Barnet, inform us that they have just completed some very extensive enlargements and improvements at their works to meet the increasing demand for carbon tissue. These include a large new coating room, fitted with the most complete machinery for coating and cutting tissue, grinding pigments, &c. With these additions and improvements Messrs. Elliott will now be able to more than double their present output of tissue. For months past their men have been working almost night and day, while, as regards the carbon enlarging department, the last month has been the busiest January Messrs. Elliott have ever had. We congratulate Messrs. Elliott on their enterprise and the success with which it is meeting—a sure sign of the firm hold which the beautiful and stable process of pigment printing has obtained upon photographers and the public.

WE are informed that the Tella film camera having proved such a great success, Messrs. Adams & Co. have sold the patent rights to the Tella Camera Company, Limited, who will shortly open convenient premises at 110, Shaftesbury-avenue, with a full stock. Agents will also be appointed throughout the country, and other steps will be taken to further popularise this well-known and ingenious instrument. The cameras will also, of course, be obtainable through Messrs. Adams & Co. as usual.

\* \* \*

THOMPSON & LEE, Close Works, Newcastle-on-Tyne, is the name and address of a newly established firm of technical photographers, who propose undertaking every description of photography for trade purposes—architecture, machinery, shipping, photo-mechanical printing for book and catalogue illustration, stereoscopic, lantern, and general work. They will make a speciality of producing photographs for reproduction as advertisement and catalogue illustrations. The firm starts with a well-equipped plant and every facility for making high-class photographs. Both partners are well-known members of the Newcastle Photographic Association, and have between them secured over fifty medals and awards; in particular, the name of Edgar G. Lee is of world-wide celebrity in connexion with excellence of photographic production. The young firm has our best wishes for its success; there is always room for good workers in photography.

\* \* \*

WE are sorry to read in the last issue of *Process Work and the Printer* that its publishers have deemed it advisable to terminate its existence with the present number. The reason given for this step is that it is felt that the trade comprised in the term "process work," to which the journal has chiefly appealed, is not sufficiently large to support a well-got-up journal with its incidental expenses. *Process Work and the Printer* was always a helpful and delightful publication. The articles were invariably judiciously chosen, and these with the very fine illustrations combined to make the publication of the highest use to those interested in phototypic reproduction processes. We are pleased to learn that *Process Work*, formerly issued by Messrs. Penrose, and which was merged into the defunct publication, will again make its appearance under the skilful direction of Mr. William Gamble.

#### THE PURIFICATION OF BENZOLE AND METHYLATED-SPIRITS WITH POTASSIUM PERMANGANATE.

WE quoted in our recent issue from a Continental source a method of deodorising benzole in which permanganate of potash is utilised, and some years ago we are reminded that a similar process was published in one of the English chemical journals for the purification of ordinary methylated spirits, while, on the introduction of the "mineralised" spirit, our contributor, Mr. W. B. Bolton, attempted similar means for rendering that preparation fit for ordinary photographic purposes. On that subject Mr. Bolton writes as follows:—

"Referring to the paragraph in the JOURNAL on the deodorisation of benzole by means of permanganate of potash, I should like to ask some of our qualified chemists whether what remains after such treatment is benzole, pure and simple. I have not tried the experiment in pure benzole, and am just now



not in a position to do so, but, just before the Excise blessed us with mineralised methylated spirit, I applied that treatment to mixtures of ordinary spirit with common benzoline, and also to benzoline alone, and, while it certainly improves the smell, I question whether it leaves the liquid otherwise as it found it. If half a teaspoonful of crystal of permanganate and a little water be mixed with benzoline and well shaken at intervals, a brown jelly-like precipitate is formed, and in time the whole lot becomes semi-solid, and acquires a rather pleasant smell in place of the original 'stink.' Very many years ago, when we used indiarubber solution as a substratum for dry-collodion plates, there were two solvents in general use, both of which were sold for glove-cleaning and general grease-removing purposes, namely, 'benzine collas' and 'Sherwoodale.' The former possessed all the nauseous pungency of the strongest mineral naphtha, the latter had a rather pleasant smell, not unlike that produced by permanganate; but the point I want to specially note now is that the presumably 'purified' sample did not possess half the solvent power of the others."

With regard to the action of permanganate on alcohol, Mr. Bolton further says: "So far as methylated spirits is concerned, there is not the least doubt that treatment with permanganate of potash converts it slowly, and not very slowly, into a variety of other substances, of which aldehyde and acetone are probably the principal, and as soon as I have a chance I mean to try if I can't develop a plate with 'methylated' so converted. I once recommended that treatment for purifying methylated spirit (not mineralised) for emulsion work, but I forgot that I applied a further process, namely, 'sunning,' in the presence of a small quantity of silver nitrate. If the purest alcohol obtainable be treated with permanganate, and then submitted to the test of boiling with nitrate of silver, as in sensitising a collodion emulsion, it will blacken most hideously, whereas before that treatment it would remain quite clear. Permanganate may be a grand 'purifier' for some purposes, but I think its functions, when applied to some substances, do not stop there."

#### UNANSWERABLE QUESTIONS.

THOSE of our readers who look through the column devoted to Answers to Correspondents must often be impressed with the number of queries that are put in reference to spots, stains on, and rapid fading of, silver prints, and also the apparently indefinite replies sometimes given. We say indefinite, for it is absolutely impossible, from the data usually furnished, to give anything else. Frequently the query is simply worded, "Kindly tell me in your next the cause of the spots on enclosed prints. Thanking you in anticipation." In another it may, in addition, be, "Is it the paper or the mount?" "I use So-and-So's paper and such-and-such a toning bath, and my printers tell me they take every care." "Do you think my boy neglects the washing?" "Is it the fault of the hypo?" &c. From such meagre information it is utterly impossible, in eight cases out of ten, to locate the precise cause of the trouble, because there may be half a dozen or more sources of it, while the results will be similar in appearance.

We could, however, generally give a definite reply in a single word, "Carelessness," which might, however, often be qualified by saying, "or lack of knowledge of the theory of the reactions that take place in the different operations in producing silver prints." Either reply, directly given, would,

no doubt, be, though true, unpleasant to the querist. Of course, if we, or any one else having the requisite knowledge, were to see the prints produced, we should at once be able to explain the cause of the trouble.

It is a curious fact that the larger majority of these queries are received from professional photographers, who, one would have thought, could, by overlooking the work while in progress, detect the cause of the trouble much better than any one else could by merely looking at a finished print or two. If they cannot, or do not, there seem to be only two reasons why. Either they do not possess the requisite knowledge, or that they are too negligent of their own interests to do so, for it must be obvious that spotty and fading prints, with the photographer's name attached to them, are by no means a desirable advertisement.

Oftentimes prints are sent with yellow stains upon them and the cause asked for, while it is obvious that they arise from the prints being allowed to stick together while in the fixing bath, the impress of other prints being palpable upon them. Yet the cause does not seem apparent to the querist. In such a case as this a definite answer can be given, and the precise reason located; but, if there is no definite impress of other prints, and similar stains may be caused by such things as the use of too weak a fixing solution, too weak to begin with, or exhausted by too many prints being fixed in it, being too cold, the prints being removed too soon, &c., the case is different. Therefore, how is it possible to say, by simply looking at the finished and mounted prints, which is the precise origin of the stain or its after-appearance when mounted. The only definite answer that can be given is "Carelessness."

With regard to spots, there are still more causes that may bring them about, all of which are avoidable with a knowledge of the principles involved and care in the manipulations. The most generally suspected cause of spots, stains, fading, &c., is the mount, the real cause, the manipulations, rarely being questioned. Even were the mounts in fault, the word "carelessness" would apply, because it behoves every photographer who values his reputation to take care that the mounts he uses will have no deleterious effect upon the prints mounted upon them. We should test them before taking them into use. It is a very simple matter, requires no chemical knowledge, and the method of doing it has, over and over again, been described in the JOURNAL, as well as in the ALMANACS.

Frequently nowadays the printing is intrusted to inexperienced lads and girls, often taken as apprentices, with a premium, or for a term without salary, while the master himself often has not the requisite theoretical knowledge to teach them the principles involved in producing satisfactory and lasting results. At one time photographic printers had a sound and well-grounded knowledge of their work, and were paid good salaries. Now the chief qualification of a printer, in many cases, seems to be simply the number of prints of good—at the present—appearance he can produce per day at a low wage. Hence the work is nowadays relegated, as we have just said, to lads and girls who are totally ignorant even of the fundamental principles involved in the work, and without the supervision of any one who is better informed. In these circumstances there is little surprise that trouble arises.

A few weeks back, it will be remembered, we directed attention to the difference there was between the robust constitution of the silver print of old and the more delicate ones of to-day by reason of the conditions prevailing. Here it



may be mentioned that in the old days the printing was looked upon as a very important part of photography; but, now that, by reason of the conditions prevailing, we have a more tender image to deal with, which requires greater knowledge to enhance its stability, the work seems to be mostly intrusted to inexperienced hands.

In this article we have spoken somewhat plainly, possibly unpleasantly, to some, though we hope not, but we have done so in the interests of our readers and of photography, for the impression is rapidly gaining ground that all photographs necessarily fade after a few years, and, unfortunately, it is in many cases only too true.

### AN ILLUSION AND ITS CAUSE.

An article by Mr. R. McCreary, in "Popular Astronomy" (THE BRITISH JOURNAL OF PHOTOGRAPHY, p. 40), seems to have excited a considerable amount of interest, judging from the frequency with which it has been copied into various periodicals. Briefly stated, he saw the sun set behind a building some distance away, which building he knew to be fifty feet long, yet it did not hide the sun. Why should it? The sun was further off certainly, but it is equally certainly more than fifty feet across. It is a simple question of relative appearance, which is, as all experience teaches us, most liable to erroneous conceptions. The whole question is an old one, and has a special interest to photographers, for there are few who make cloud studies who, in putting in a sun or a moon, do not make egregious errors in this very direction. The moon or the setting sun is almost always represented on too large a scale.

It is true that the moon, seeing that the angular measurements of sun and moon are practically identical,—one orb answers as well as the other,—always appears larger when near the horizon; but the effect is physiological, and not optical, and it at once disappears if the orb be viewed through a piece of paper rolled-up telescope wise. It would be an excellent object-lesson for any photographer contemplating putting a moon into a lantern-slide picture, for example, to wait till he next saw a full moon, then to hold at arm's length some circular object just large enough to cover the moon and hide it. It will surprise most of our readers to know that such object is not, as would be generally supposed, a dinner plate, but a good-sized seed pea! Slide-makers, take note.

**Secco Films.**—Under this name a recently formed Company, in Berlin have placed on the market a new film, which, from all accounts, is a bromide emulsion, coated on paper which has been previously coated with collodion. The films are treated in the ordinary way, but to the last washing water a few drops of glycerine are added, and the film soaked in this and then brought into contact with a "strengthening film," which is also soaked in the water and glycerine; the two are squeezed into contact and dried, and the papers stripped off. The strengthening film is nothing more than paper coated with collodion, so that the final result is the image-bearing film, enclosed between two films of collodion. They are said to be twenty-five per cent. cheaper than plates and fifty per cent. cheaper than colluloid films.

**Uranium Toning.**—M. L. P. Clerc recently read a paper before the Société Française de Photographie in which he states that there are two ferrocyanides of uranium and potassium, one of which is quite soluble in water and which only precipitates after standing some considerable time; the other insoluble in water, but

soluble in alkaline carbonate, sulphocyanides, and alkaline ferridcyanides. When a silver print or negative is placed in a mixture of ferridcyanide and a uranium salt, ferrocyanides of silver and uranium are formed; the former is white and opaque, and the latter coloured, and, if the uranium salt is in excess, the colour of the latter is brown; but, if the ferridcyanide is in excess the colour is red. In order to obtain the brown image, solutions of ferridcyanide of potassium and nitrate or acetate of uranium should be made up of equal strength and mixed in the proportion of ferridcyanide 50 parts, acetate 75 parts, or nitrate 90 parts. If the red colour is wanted, then the proportions should be ferridcyanide 50 parts, acetate 60 parts, or nitrate 70 parts. Sepia tones may be obtained with great ease by merely weakening the bath, and M. Clerc states that in all cases one per cent. of the salt is the best strength. It is always advisable to wash in water acidulated with about  $\frac{1}{20}$  acetic acid, and, should on drying the whites of the print become stained, this stain can be instantly removed by plunging the print into water heated to 60°, which will instantly dissolve the gelatine where there is no image, but leave the image intact.

**Dr. Burckhalter's Device for Photographing the Corona.**—The astronomer who writes in the *English Mechanic* over the signature "A Fellow of the Royal Astronomical Society" gives an account in a recent issue of the complete success attending the use of Dr. Burckhalter's mode of photographing the whole of the corona at one operation. The principle of the device consists in so graduating the exposure, during the stage when the sun's disc is wholly covered by the moon, that the various zones of the corona, with their differing degrees of actinic intensity, should be so alternately screened and exposed, in the exact proportion of their brightness, that in the completed exposure no part should be either over or under-exposed. Dr. Burckhalter writes that his method was tried by the Pierson expedition to Wangi in the Deccan during the total eclipse last year, and the result was a perfect negative. "As I write there lies before me a beautiful photograph of the solar corona with most delicate hair-like rays visible even in the paper print. I have no doubt that in the original negative there must be a marvellous amount of detail shown." So writes the F. R. A. S.

**Liquid Hydrogen and Crookes' Tubes.**—Professor Dewar, in his lecture at the Royal Institution last Friday fortnight, again showed the advantages of liquid gases for the ready production of a vacuum suitable for, if not, indeed, of too great tenuity, the ready making of Crookes' tubes. A closed tube is immersed in liquid hydrogen, and immediately the air solidifies and falls to the bottom; if the tube were so arranged that the part containing the accumulation of solid air could be sealed off, the other portion would, according to Sir William Crookes, have a vacuum of only one ten-millionth of an atmosphere.

**The Constitution of Incandescent Gas Mantles.**—All experienced in the use of gas mantles are aware of their different quality at the present time compared with that of a few years ago. This is largely owing to the different proportions of the rare earths employed in making the mantles. The translation of a paper by Herr E. Hintz on the subject is given in a recent number of the *Chemical News*, and from it we learn that the proportion giving the highest light effect is as follows: Thorium-cerium (99 per cent. thorium, 1 per cent. cerium oxides), 95 parts; 5 parts didymium. In recommending the use of incandescent gas burners for photographic purposes, one most important quality of their light, though familiar enough to those who have used the light for any length of time, is quite lost sight of by photographic writers. We allude to the fact that, with a given rate of pressure of gas, the luminosity exhibits a gradual, continuous falling off. The extent of this is referred to in the article we quote from. Thus a certain mantle giving 17 Hefner units at first, with a consumption of 115 litres per hour, gave, after 800 hours' burning, no more than 7.5 units at virtually the same rate of gas consumption. Another



mantle, of different composition, gave a drop from 40 to 27 units in 400 hours, and to 22 units in 800 hours; and a third gave 54, 38, and 32 units. It is quite evident that, with such conditions as these obtaining, the assertions as to the so-called certainty of exposures will have to be modified.

ANOTHER point in the use of gas mantles may be referred to. This is that, except in the very newest pattern of chimneyless burners, the pressure of gas at the burner must be adjusted with the utmost nicety. The least excess of pressure, and the light is diminished greatly.

**Making Wood Fireproof.**—Dr. C. J. Hexamer recently read a paper before the Franklin Institute describing a simple method of carrying out this object, which should be of the greatest use for those interested in the construction of photographic studios. The method was designed for the purpose of being utilised for the woodwork of vessels of war, but it is evident that it would be equally useful for any other place where fireproof woodwork was desirable, and in none would it be more useful than in studios, which, under existing rules, have to be weighted with such extravagantly heavy premiums for fire insurance. Stripped of explanatory context, Dr. Hexamer's method is very simple. The wood is first dried in a specially strong and tight chamber, which is afterwards exhausted of air; after this a solution of water glass is sprayed into the chamber, which causes a thorough impregnation of the pores of the wood. Finally, a solution of chloride of ammonium is injected into the cylinder, and a pressure of ten atmospheres applied. The result is the deposition in the innermost pores of the wood of gelatinous silica, which causes almost a petrification, and renders the wood as unflammable as stone.

**The Properties of Aluminium.**—M. A. Ditté, at the Paris Academy of Sciences, recently referred to the belief that aluminium is a metal which resists the greater number of chemical reagents. M. Ditté finds it otherwise. When the metal is placed in dilute acid, it dissolves rapidly at first, but a layer of gas is deposited on the surface, which resists further action. This layer adheres with the utmost firmness to the metal, but, when got rid of by reducing the atmospheric pressure or otherwise, the metal dissolves entirely. A solution of common salt acts at first, but produces an insoluble deposit of  $\text{Al}_2\text{O}_3$ , which arrests further action. The same thing occurs with salts of the alkaline earths—in fact, M. Ditté's experiments go to show that almost all chemical agents have an action on aluminium.

**Death of Herr Müller.**—It is with regret that we have to record the death of Herr Max Müller, Professor at the Technical High School at Brunswick and author of a well-known book on photography with magnesium.

#### ON THE DETERMINATION OF THE FOCAL LENGTH OF A COMPOUND LENS.

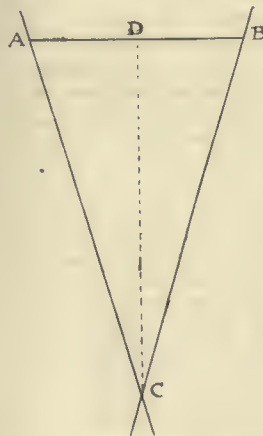
THE recent Traill-Taylor lecture, with its description of the focometer invented by Mr. Dallmeyer, have led one of your correspondents to make inquiries about getting one of these instruments for use; I think it may therefore be desirable to consider the question which heads this paper from the practical point of view of a working photographer.

To begin with, I may at once say that it does not seem to me that any practical want of a photographer involves an accurate knowledge of the focal length of his lenses; and that, however ingenious an apparatus may be, it is of little use to him unless the cost be very moderate and the facility in use be very great. A photographer rarely needs to determine the focal length of a lens for himself, and an expensive apparatus is valueless to him; valueless because the cost would have to be added on to that of the few lenses for which he would use it, and still more because a familiarity with the apparatus, and its being in working order, are essential to obtain good measures. To ensure these preliminary

conditions for good determinations will require an expenditure of labour and thought quite out of proportion to the results. It is a common delusion that by purchasing refined apparatus an untrained person can at once obtain results of great accuracy. It would be as reasonable to expect that, by supplying a ship with all the best navigating appliances, one could ensure a safe voyage with a crew of landmen. The truth is, that a trained man with the simplest means produces better results than the most refined means would give in unskilled hands. From this cause Mr. Dallmeyer's focometer is not a suitable apparatus for the photographer, whether he be amateur or professional. It is meant for the optician, and its especial province is to determine focal length in certain cases where other previous instruments failed. The practical photographer has only to deal with one case, which is manageable by well-known methods, that is, the determination of the focal length of such lenses as are used in the camera. Such lenses, from the very nature of things, are, as a whole (and it is only as a whole that the photographer has to do with them), what are called by opticians *positive lenses*, and it is quite possible to acquire such a knowledge of their focal length as is needed for ordinary purposes, without any apparatus more elaborate than a pair of compasses and a divided scale.

First, there is the method sketched out by Mr. Welborne Piper in your ALMANAC for this year. As he only gives the formula, perhaps I may be allowed to describe the determination of the focal length of a Cooke lens as an example of the actual working.

Having fixed my lens on the camera, I focussed carefully on the spire of a distant church at the centre of the ground glass (the axis of the lens having been adjusted to coincide with this centre), and a scratch was made on the fixed part of the baseboard where it was crossed by an appendage of the movable portion; this mark may be distinguished as A. A printed card was then clamped between the top and bottom of a box, and the camera so placed that, when the image of a letter was brought into focus on the ground glass in two positions, at different distances from the lens, it would occupy the same place on the ground glass. This is done by making the height of the camera, when level, suitable, and then choosing the letter to be focussed at both positions. If the camera be firmly clamped, the two positions of the object will necessarily be in



the line of the axis, and the two positions were marked, and also the corresponding places of the focus as shown in the same way as for mark A. Calling these two marks B and C, I proceeded to measure the distances, AB and AC, with compasses and a well-divided scale, and found them to be 4.290 inches and 1.812 inches, also the distance between the two marked positions of the card was 570.3 millimetres = 22.46 inches.

$$\text{Hence } F = \frac{22.46 \times 4.290 \times 1.812}{2.478} = 8.39 \text{ in.}$$

I would now offer some remarks for the benefit of the tyro. It will be seen that I have made use of two units in my scales for measurement. This has simply been because the shorter distance could be more accurately compared with a scale in my box of instruments, whereas the longer distance was most readily determined by the use of a tape divided in metric measure. The object in each case is to get each measure accurately, but slightly more error can be tolerated in the longer distance; how much must be left to the discretion of the operator. Generally it will be found that a decimally divided scale will be most convenient for use, and that, of such, one metrically divided will be more convenient than the inch and its fractions. I should mention that this



procedure is available only in cameras where the focussing is done by moving the back. If the front carrying the lens is moved, the extent of motion,  $n c$ , must be added to the interval between the positions of the object.

Then, as regards focussing, probably every photographer thinks he knows all about it; but in this matter, when examining a lens of large aperture it will be seen that some precautions are not out of place. First, since no screen is perfectly flat, it is necessary to focus on the same part of it, and this is near the centre, where the axis of the lens should cut it. Next, a magnifying glass should be used, of a pattern which admits of the position being fixed when the grain of the ground glass is clearly defined and sharp. With the lenses of large aperture, now so general, and a well-lighted and defined object, it will sometimes be found that, when the eye is traversed before the magnifying glass, the image of the object seems to move slightly if compared with any recognisable grain of the glass. This is due to the image not being on the screen, and the error should be corrected by the usual means till the image remains fixed on the screen. Of course, care must be taken that any mark used for this purpose is on the ground surface of the screen, and is not merely attached to it.

I proceed now to describe another way of obtaining the desired end, which was recommended some years ago by, I believe, Mr. Dallmeyer himself. Make two marks on the ground glass of the camera screen, at the same height as its centre, and near the edges, but so as to admit of the focussing glass being used to examine them (on my half-plate camera I find that about 5 inches is suitable). They may be conveniently made on a strip of paper and fixed temporarily at the proper height, as this will allow of their being easily measured on the paper being withdrawn.

On a table put a large sheet of paper, and set it in front of a window commanding a view of some object in the horizon at a distance which is sharply defined, and focus it carefully in the centre of the screen. If there be no suitable object near the horizon, then the support of the paper and camera must be tilted till some suitable object can be brought into the centre for focussing and fixed in that position. Now, without altering the focus, move the camera round till the image of the selected object comes on one of the marks, and fix the position of the camera by a pencil line on the paper drawn along one of its edges, or preferably along a straight-edge carefully placed in contact with a side of the baseboard; then turn the camera, being very careful not to shift the paper, till the image coincides with the other mark, and again draw a line as before. In order to do this so as to have the lines conveniently placed on the paper, it may, and will generally, be desirable to move the camera bodily. This is unobjectionable if the object of reference be far enough off. The desirable positions for the lines is when they intersect near one end of the sheet, and can be made of some length.

We shall now have a sheet of paper with two lines on it, which by their inclination measure the angle through which the camera has been moved. Call the point of intersection  $c$ , and along the two lines set off equal distances,  $CA$  and  $CB$ ; join  $AB$ , and bisect it by a perpendicular from  $c$  to  $D$ , the centre point. Measure  $AB$  and  $CD$  carefully. Then  $f = a \frac{CD}{AB}$ , where  $a$  represents the distance between the two marks on the ground glass.

With the same lens as before, two marks were made on the ground glass of the camera, whose distance was found to be 4.93 inches. The distances,  $CA$  and  $CB$ , were each set off 300 mm., and  $AB$  was measured 167.1 mm., and  $CD = 288.3$  mm.

$$\text{Hence } f = \frac{288.3}{167.1} \times 4.93 = 8.50 \text{ in.}$$

It does not matter what the unit of measurement of  $AC$  and  $CD$  is, as we are only concerned with their proportion.

It may be thought that the difference of values I have found for the focal length of this lens is excessive, considering that the fixing of an object in focus is liable to far smaller errors than one-tenth of an inch, but it is to be remembered that only one end of the length is so determined, the other has to be deducted from the observations, and the errors inevitable in the measurements are multiplied in these cases, as in all such. It will take a good deal of care to get even such good results as above.

An apparatus like the focometer might be, with advantage, used with Mr. Piper's method, and would give more accurate results; but those above are good enough for the purposes of a photographer, who would do well, in case he wants better, to apply to some competent optician who has the needful apparatus and th to use it. J. F. T.

## THE THEORY OF THE GUM BICHROMATE PROCESS.

HERR BEHRENS publishes in the *Photographische Mittheilungen* an interesting paper on this subject. He first tried why it was not possible to use ordinary carbon tissue like bi-gum, that is to say, without transfer, and he ascribes it to the thickness of the film, which in the ordinary tissue is about 1.1 mm. thick, whilst in the gum-bichromate film it is only 0.025 mm. The ratio between the two is therefore about 400 : 9. The thick film cannot be therefore printed right through without the surface becoming tanned and insoluble, whilst, with the thin film, the half-tones even print right through, and thus adhere to the paper. An interesting experiment was made by Herr Behrens, as follows: He sensitised a sheet of bi-gum paper, and, after drying, folded it in half, so that the two films were in contact, and then made the upper paper transparent, and printed under a sensitometer. The light penetrated right through to the second film, and, on development, this showed only a few numbers below the upper film, so that enough light penetrated the first film to produce an image on the second. When the same experiment was made with a negative, two pictures could be obtained. He also noted that, during exposure, brown chromic oxide, which has strong tanning powers, was first formed, but that on longer exposure this was reduced to green chromous oxide, which has not such a strong tanning action; and, if the exposure was still further extended, a negative was obtained instead of a positive.

## ORTHOCHROMATIC PHOTOGRAPHY.

[A Paper read before the Sutton Photographic Club, on Thursday, February 2.]

ORTHOCHROMATIC, from *Orthos*, right, and *chroma*, colour; or *Isochromatic* from *Isos*, equal, and *chroma*, colour, as this particular process of photography is somewhat indiscriminately called, is so far misleading, in that colour, as such, does not enter into the matter at all; such terms would be more strictly applicable to that which scientists all over the world are striving to obtain, i.e., "Photography in Natural Colours." What is really meant, however, by these terms as at present applied, is a more exact, more true, rendering in monochrome of the colours of nature. Unfortunately it so happens that the colours which have the greatest effect on the eye have the least effect on the photographic plate, and the object of orthochromatic photography is, to quote Professor Meldola, "to bring visual intensity and photographic intensity into harmony." The coloured objects in nature, such as flowers, &c., and artificially coloured objects, such as paintings, coloured paper, &c., show in their different colours because they are only capable of reflecting certain portions of white light, and, if viewed by any other than white light, their colour appears to us to be altered. Thus, I have here a card on which are pasted four very distinct colours as we see them in daylight; but now, if I throw on to this card a sodium flame, the colours no longer appear to be the same as they were before, with the exception of the yellow, because there does not exist in this monochromatic flame any light vibrations to which they are capable of responding. Let me illustrate these light vibrations or wave-lengths in another way. I have here what is called a wave-slide (which I made for quite another purpose, but which will serve to illustrate this point), and you will see that, as it is moved along, a lot of waves in apparently progressive motion appear on the screen. You will also notice that one wave, which we may call the violet, appears to move twice as fast as the other wave, which we may call the red. In reality these waves do not progress at all, it is only an up-and-down motion, as you will notice by the coloured dots, the other effect being merely an optical one; but you will also see why the violet end of the spectrum is more active than the red end, the wave-lengths are much shorter and more rapid at the one end than at the other.

## HISTORICAL NOTES.

From this it is obvious that the problem we have to solve is not an easy one. In 1873 Professor H. W. Vogel, of Berlin, whose loss the scientific world has so lately had to deplore, made the first step in this much-desired direction, and, since then, numerous experimenters in England, America, Germany, France, and Russia have been continuing the investigation, among whom may be mentioned Captain Abney, Professor Bothamley, Dr. Eder, Mr. Ives, Mr. Cadett, Mr. Sanger Shepherd, Mr. L. Warnerke, MM. Lumière, and others. Those interested in the subject will find numerous articles relating thereto in *THE BRITISH JOURNAL OF PHOTOGRAPHY* and its *ALMANAC*, also in *Photography Annual*, where also may be found references to a great number of foreign papers, published in Germany and elsewhere. I give the following extracts in order to indicate what has been done in recent years with regard to this most interesting subject. In May, 1894, Professor W. K. Burton recommended a screen of gelatine (twenty grains to the ounce), stained with ammonium picrate; and, in November, 1895, the same author made some further observations on picrated gelatine for use as screens, and also for a safe dark-room light, but both he and Mr. Spiller pointed out that such a screen was not very reliable, owing to the action of the light



on the pierate. In May and June, 1894, Mr. E. J. Wall delivered two valuable lectures on Colour Photography at the Cordwainers' Hall, which were published in THE BRITISH JOURNAL OF PHOTOGRAPHY; he also made a translation of Dr. Eder's German work, which appeared in the pages of the *Amateur Photographer*. There is, unfortunately, no corresponding work in English. In November, 1894, M. Leon Warnerke read a paper on Chromatic Photography, referring specially to the plates issued about that time by the MM. Lumière, and which consisted of three series—i.e., A, sensitive to yellow and green; B, sensitive to yellow and red; and C, also known as "panchromatic," sensitive to yellow, red, and green. The author used a screen; the form to which he gave preference was a liquid filter (similar to the one I show you, and which I made for a demonstration given by myself to the Croydon Microscopical and Natural History Club in February, 1895) placed at the back of the lens. But that was not what the author considered the best way of using a light-filter, which was to place the filter in front of the source of light, be that daylight or artificial light, and to illuminate the subject itself with monochromatic light. In November, 1894, Captain Houdaille published a paper in the *Bulletin de la Société Française* on "Orthochromatism in Photography," in which he tested the sensitiveness of plates (he seems to have used Lumière's) to various reflected colours, preferentially to those given by a prism. He made preliminary experiments on the orthochromatism of the human eye, from which he deduces that white and yellow produce the same impression on the eye, green is more feeble, and red still more so. Taking 100 as the aggregate of the four colours, he found that the sensitiveness of the eye to the colours was as follows: white, 29; green, 22; yellow, 29; and red, 20. In testing plates he employed four varieties of light, i.e., sunlight and magnesium (which were similar in their action), petroleum flame, and flash powders. In conclusion, this author considers that it is quite possible to exaggerate the importance of orthochromatic emulsions, and states that an ordinary plate used with a screen is equal to series A plate without a screen. That an ordinary plate with four times the normal exposure is about equal to series B normally exposed; and that an ordinary plate exposed to a petroleum flame is nearly identical with series A exposed to diffused light. What some of our writers of the present day would say to such statements I do not know, but I doubt if they would be allowed to pass unchallenged.

In March, 1895, Mr. J. W. Gifford in a communication on "The Correct Values of Colours in Photography," remarks that pure spectrum colours differ materially from those seen around us in nature, and that hence, in order to do correct work, while the pure spectrum colours are absolutely essential, these must be supplemented by such other colours as we find in nature, in painting, in chromo-lithographs, and in coloured charts. He then proceeds to say that plates have been prepared which are not only sensitive to the blue and violet, but also to the green, yellow, and red, but still leave a gap in the green (we shall see presently how Mr. Cadett has attempted to supply this deficiency in his spectrum plate). To fill up this gap in the green, either a plate must be made which is sensitive to this particular region of the spectrum, or a screen or light-filter must be used to exalt the sensitiveness of the green and red, by weakening the effect of the other colours.

#### ABNEY'S "ORTHOCHROMATICS."

We now come to a very important point in the history of our subject, for, in June, 1895, Captain Abney, whose name is inseparable from orthochromatic photography, published a long and most valuable paper on "Orthochromatics." This paper was read before the Photographic Society of Great Britain (now the Royal) and printed in its *Transactions*, and is constantly quoted by writers on the subject. In this paper he points out that the problem is to obtain a negative which shall give to a monochrome print as correct values for colour and its shades as it will give in a reproduction of a black-and-white subject. Taking a chart consisting of the colours red, yellow, green, and blue, he proceeds to show what the luminosities of these colours are, and that it varies in a very marked manner according to the lighting. Again, these are not pure spectrum colours, inasmuch as they reflect other colours besides the red, yellow, green, and blue. Thus a complicated task is provided for us, and what we have to do is to find a suitable plate and screens which will give in a print these relative luminosities. Captain Abney then proceeds to work out these problems in a way that but very few could hope to imitate, and I must therefore refer you to his original paper. He, however, repeated and emphasised Mr. Cadett's remark in the discussion which followed the reading of the paper, as to the great importance of having carefully selected colour screens, and he thought that makers of orthochromatic plates should in future send with them a proper screen, as certainly the plate and screen must go hand in hand.

#### THE CADETT PLATES.

We now come to November, 1895, when Mr. James Cadett read a paper (which was published in February, 1896) on "Colour-correct Photography and a New Plate," in which, after referring to the work done by Captain Abney, Mr. Gifford and the MM. Lumière, he described his new plate, and showed, by means of slides on the screen, what its capabilities were both with and without a colour-filter. Replying to a question as to how

such plates were to be developed, Mr. Cadett stated that, having ascertained about the correct exposure, the plates could be taken out of, as they were put into, the slides in total darkness, and developed by time, and, if then it should be found that the density was too great, they could afterwards be reduced. Since Mr. Cadett read this paper, his firm have issued a "Safelight" by which inspection of the plates in course of development may be carried out; this glass only passed rays at the extreme A or red end of the spectrum, and was always tested before being sent out. Referring to the fact that MM. Lumière advised the use of a faint green light, Mr. Cadett stated that their plates were deficient in that very green light which was recommended. In the volume of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for this year (1899) will be found an article by Mr. Alfred Watkins on the development of these plates by time, using his eikonometer for the purpose. Mr. Cadett, replying to another question as to whether his plates were perfect without a screen said, No, the blue was still too great, but with a light yellow screen, such as an alkaline solution of potassium chromate, there was a practically perfect range throughout. In June, 1897, Mr. H. T. Malby read a very interesting and practical paper on "The Correct Rendering of the Colours of Flowers," and this gentleman has also prepared an Affiliation lecture, illustrated by lantern slides, on the same subject, so that those societies which have joined the Affiliation will be able to have the benefit of it. Mr. Malby, judging from his paper, does not appear to have gone aside to make screens, &c., but used the Ilford and Edwards plates, and the light and dark screens issued by them, and also the Burchett screen, with such flowers as daffodils, wild roses, narcissi, iris, and some orchids, so that, with such materials easily to hand, any one could repeat, and possibly extend, the observations made by him. In July, 1898, we have an important paper by Mr. Sanger Shepherd on "The Scientific Translation of Colour into Monochrome," in which the author, after stating what the object of orthochromatic photography is, goes on to say that the difficulties may be overcome in three ways, i.e., 1. To have a plate sensitive to the various colours. 2. To employ coloured screens. 3. To use a combination of both these methods. I shall have occasion to refer to both of these papers again presently.

#### SENSITISING PLATES.

I fear I have somewhat tired you by what I may call the chronological history of the subject, and so will pass on to more practical matters. Now, as you all know, there are plenty of plates on the market which are sensitised for the various colours. Edwards, Ilford, Lumière (who, by the way, have recently made a colour-sensitive film) and Cadett, are names familiar to you all. There are two methods of sensitising a plate, i.e., 1. To add the dyestuffs to the emulsion previous to coating; 2. To dip the ordinary plate into a solution of the dyestuff and drying it in the dark. The last operation could, without any great difficulty, be performed by the amateur experimentalist. What the precise nature of the action of these dyestuffs on the silver haloids is cannot at present be accurately stated. According to one theory (the physical) the light vibrations absorbed by the dyes are transferred to the silver salt, thus rendering it sensitive in the region of absorption; but, according to the other theory, the chemical, which has been made the subject of many experiments, notably by Dr. Eder and Captain Abney, there exists a sort of weak chemical union between the dye-stuff and the silver salt, and that this compound, whatever its nature may be, is decomposed by the action of light (Eder); or that the colouring matter undergoes photo-chemical decomposition, giving rise to products which act as reducing agents on the silver haloids; and, seeing the highly complicated molecules possessed by these dyes, it is not to be wondered at that, among the products of their decomposition, substances of a reducing nature should be formed (Abney). The chemical hypothesis of orthochromatic action rests upon the fact that the best special sensitisers are the most fugitive dyes. In this connexion it is interesting to note the special action of the spectrum colours on the silver chloride, which was noticed by Seebeck in 1810, Sir John Herschell in 1840, Becquerel in 1847 and 1855, and other observers, but quite recently by Carey Lea, whose work in this direction, in close connexion with that greatest of all photographic problems, i.e., photography in natural colours, was very ably reviewed by the Editor in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for this year (1899).

#### SCREENS.

Passing from plates to screens, which still appear necessary for obtaining the best results, we find that no less than five different kinds of screens are made or suggested, thus (1) a gelatine film with which has been incorporated the colouring matter to be employed; (2) a plain gelatine film which is soaked in a solution of the colouring matter, raised and dried; (3) a stained collodion film; (4) screens of coloured glass; (5) a liquid light-filter contained in a glass cell. I show you specimens of all five of these varieties; with the three first it is best to varnish them with a mastic benzole (sixty grains to the ounce answers very well). The dyestuffs employed are several, and consist mainly of the aniline colours, which are, as you know, derived from coal tar. Con-



sult Benedikt's "Chemistry of the Coal-tar Colours." I show you some of them from which the screens are prepared, i.e., aniline yellow, naphthol yellow, brilliant yellow, multiple yellow, aurine, chrisoidine, aurantia, malachite green and naphthol green; then there are two inorganic substances, i.e., the chromate and dichromate of potassium, together with picric acid, or its ammonium salt, which, however, as previously stated, is not altogether reliable if exposed much to the action of light. Now, when we get one of these dyestuffs, the first point to ascertain is what it is soluble in; if in water, it may be used either for colouring the gelatine previous to coating the glass, or for soaking the already coated glass in, and here I may state that either micro-cover glass, patent plate or thin lantern plates may be used, if flat and they do not distort the image; if the latter, fix, wash, and dry unexposed plates, and then soak them in the colour. With a water soluble dye, screens of various strengths of colour are easily obtained by taking several pieces of the gelatine-coated glass, putting them into a dish with the dye solution, and removing them at intervals, say of 1, 2, 4, 6, 8, 10, and 15 minutes. The specimens I have here are partly produced in that way, but most of them were made by taking a sheet of patent plate which was quite flat and almost colourless, carefully levelling it, flowing it with a warm solution of gelatine (twenty grains to the ounce answers well), previously filtered bright by the aid of a hot-water funnel, and covering it over with a large sheet of glass supported at some distance (three or four inches) above it, to keep off dust, &c., and allowing it to dry; when quite dry, it may be cut up into squares like these. These squares may be used in three ways, i.e., (1) the gelatine may be soaked in the coloured solution (gelatine has a great affinity for these colours); (2) the gelatine surface may be flowed over with a coloured collodion; or, (3) a combination of these two may be used, that is, the gelatine may be stained one colour, and, when dry, flowed over with a collodion of a different colour. Two such compound pieces I have here which, if bound together like a lantern slide, form a very safe dark-room light (Sanger Shepherd). If, however, the dye is not soluble in water, but soluble in spirit, then a collodion must be made of it, by dissolving it in a mixture of one part strong alcohol and two parts of highly rectified ether, filtering if necessary, and then dissolving a structureless gun-cotton (high-temperature cotton answers well) in the proportion of six grains to the ounce. The coloured collodion thus obtained, several samples of which I have here, may be flowed over the gelatinised plate, (thus), and, when dry, varnished with the mastic-benzole varnish (thus). Then we have screens of coloured glass, and these undoubtedly would be the most convenient if we could obtain glass of the requisite colour, which unfortunately we cannot at present. Several glass screens are, however, on the market, such as Ilford, Edwards, Carbutt, Burchett, &c., these last are made by Dallmeyer, and consist of two glasses, one a very light amber or orange yellow, and the other a light green; but Mr. Burchett states that the deeper the yellow the better the result, although, of course, the exposure has to be prolonged. Finally, there are the liquid, or ray filters, as they are called; one of these I show you made by myself in February, 1895, in illustration of a paper I read on "Orthochromatic Photography" before the Croydon Microscopical and Natural History Club, and which any one can easily construct for himself; and the Bausch & Lomb filter, in which a similar idea is carried out in a more complete and very much more expensive way. These filters can be used for any of the water soluble dyes (they must not be used for spirit soluble dyes), and Bausch & Lomb issue with theirs a solution of dichromate of potash; Mr. Cadett recommends a neutral or slightly alkaline solution of the chromate. A specimen of this filter I also show you. This class of filter, especially my simple, cheap, and easily made one, is convenient, because a number of liquid dyes can be rapidly experimented upon. I also show you a handy contrivance for fixing them in front of the lens, where they can be readily got at, and for the rapid changing of the cells. With regard to the strength of the solutions, either in water or collodion, so much depends on the intensity of the dye and the sensitiveness of the plate, but somewhere about from half (or even less) to two per cent. of the dye will probably be found to give satisfactory results.

In conclusion, the points to be remembered for the best rendering of colour values in photography are: 1. Use an orthochromatic plate; 2. Back the plate, if possible; 3. Use a colour screen or light-filter, which will generally be of a yellow or greenish-yellow colour; 4. Adapt the screen to the work in hand, that is, if a subject, such as flowers, is all one colour, say all red, or blue, or yellow, there will be little, if any, advantage in using a screen; but, if it be blue and red, or blue and yellow, or a mixture of all three colours, then a screen becomes necessary for suppressing the blue, and so giving the red and yellow time to act on the plate; 5. Give always a full exposure, by preference in a subdued light rather than sunlight; and 6. Develop in a solution weak in pyro, but strong in alkali (for some subjects half a grain of pyro to the ounce is ample), and so obtain a soft negative, full of detail, but with no harsh contrasts. I do not pretend to be in any way an authority on this subject, but have found much pleasure during some weeks in working at it, and give you my results simply in the hope that you may find as much interest in the matter as I have done. I will now put a few comparison slides (not beautiful pictures) on the screen, from which you will be able to form an opinion on the merits of orthochromatic over ordinary plates.

J. H. BALDOCK.

## PHOTOGRAPHIC SOCIETY LIFE.

BEFORE the London and Provincial Photographic Association, on February 2, Mr. Walter D. Welford read a paper upon "Photographic Society Life." He stated at the outset that his remarks were intended to be of a criticising nature, but in no way offensive, and the criticism was aimed at what he considered as possibly the worst phases of society meetings. He was of opinion that there were many things capable of improvement, and that without destroying the sociability of some or the business qualities of other societies, but for all that he felt that, the more our meetings tended towards the social nature, the greater the danger of abuses creeping in. To take the question of attendance; who made the Society or helped it along? he asked, replying that it was the regular attender. And yet the very fact of his being regular brought him very often within the scope of the proverb, "Familiarity breeds contempt;" for after a while people began to think less of him, as they got accustomed to his sayings. But let a member turn up who had not been seen for some time, and everybody wanted to know what he had to say. Instead of being received with open arms he should rather be fined for neglecting his duties, and yet he is often the man who, putting in an appearance after an absence of six months, is put in the chair. On the face of it he was hardly an efficient Chairman, although well and good if the Chairman be only a figurative expression. However, even such a man made a better Chairman than the one who argues for the whole meeting. The first, knowing nothing through long absence, says nothing if he be wise, but the other makes a point of arguing with each speaker, with the result that the meeting is a one-man show. Proceeding to another point, much has been said of late that lantern lecturing was on the decline. The reason was—photographic societies. To see the slides, and to hear upon what plate it was made, and how developed, was all they asked. Leave the descriptive matter to the missions, but show us slides. Personally, the lecturer was heartily tired of the way slides were pushed through the carrier one after another as fast as they would go, with a couple of words to describe them. In a word, he maintained that, although all slide displays need not be accompanied by a lecture, the further we got away from the disgraceful scramble, now so prevalent, the better for everybody.

Mr. Welford next emphasised the importance of absolute impartiality in the management of a Society. Everybody should be under one code of rules, whether he be President, Secretary, or an ordinary member. This is more felt when certain few members practically run the Society. This is often called a clique, but wrongly, he thought. However, in the sense in which the word was often interpreted, in many cases a clique was a positive boon. So long as it worked for the benefit of the Society, the clique was admissible; but, when it got at loggerheads with the membership, it became the very reverse. Mr. Welford then criticised the poor treatment only too often meted out to lecturers, especially in London. A provincial man, with perhaps a few friends of his own in the place, is left to find his way to the meeting-place alone, he receives a hearty vote of thanks for his trouble, the members file off home, and he waits about by himself for his train home. The speaker considered this a scandalous state of things, and that somebody should be deputed to look after the comfort of such lecturers, who, often at considerable inconvenience, made very long journeys to instruct a thoughtless class of men.

Mr. W. T. Wilkinson said that, as regards the latter part of the remarks, it was well known that Yorkshire treated its lecturers in a first-class manner, and he should like to see the practice extended more generally.

Mr. H. Vivian Hyde noticed that no mention was made of the treatment accorded to beginners in many of our London societies. He felt that this was a branch of the membership which should be catered for. The future of societies depended upon the influx of new members, and a little more encouragement extended to this class was highly to be desired.

Mr. Philip Everitt thought that, in the case of the plea for more descriptive matter at lantern displays, it should not be forgotten that very often it is the question of the development or exposure of the photograph shown that interests the members most, and he should never condemn a man for passing through his slides and stating the particulars he mentioned, or any other point of technical interest. As regards the status of the beginner, this Association, he thought, was in a very advanced position. The old custom of pouncing upon the raw beginner and holding him up to ridicule had happily died out. In a sense he thought there was more to be learnt from faulty work than perfect pictures. Cliques, he thought, were bound to occur, but he saw no objection to them as long as they were employed for good.

Mr. Mackie spoke to the effect that the treatment accorded to beginners was to a large extent dependent upon the attitude they assumed. To show a bad result for admiration was a sure means to invite ridicule, but he thought the beginner who brought forward his work with a view to acquiring better knowledge stood in no fear of such treatment.

Mr. Rapson, as a beginner, received much valuable help from criticism of his work in days gone by, and other speakers testified to the same effect. The discussion was a long and interesting one, though being almost wholly confined to the question of the beginner, a point not touched upon in the paper.



# ELEMENTARY OPHTHALMICS.

At the meeting of the Photographic Club on February 1, the Rev. F. C. Lambert gave a lecture upon "Elementary Ophthalmics."

Ophthalmics, he said, was a useful term to include those curious phenomena of the eye which are out of the domain of the surgeon or physician, and not essentially within the knowledge of the scientific optician. The subject was an interesting one to all people who took a reasonable interest in the world outside them; and in the use of their own eyes, and for the purposes of the lecture, he would assume that nobody present had knowledge of the subject, or at least had given it no attention. He regarded the eye merely as a dark chamber with a lens in front, and at the back a sensitive surface. The first thing that struck one was the well-known but little-realised fact that things were seen upside down. Proof of this could be had by performing a simple experiment in the following manner: A piece of brown paper, doubled to ensure opacity, should be pierced with a pin and held by one hand a short distance from the face in a line drawn between the eye and a lamp. With the free hand a pin, head up, is brought close in front of the eye, and, when it intercepts the beam of light, the shadow (not the image) is seen to be inverted.

Every eye, so far as is known, has a blind spot. This fact is one that is not so little known as how it happens and how to find it. If we were to examine an eye, we should find that exactly opposite the axis of the lens on the retina there was a depression. To one side of this—always on the side nearest the nose—enters the optic nerve, and it might well be imagined that the most intense sensations of vision would be where the nerve enters the eye; but, so far from that being the case, the point where the supply of nerve fibres enters the eye is the blind spot, caused by the presence of the artery which supplies the extremely fine blood vessels of the eye with blood. The region of acute vision is the depression mentioned, and it is this little spot with which we really see, the other portions receiving only a vague sensation of anything before the eye; in other words, the eye has to be directed full upon the object to bring it within critical vision. A practical method of showing the presence of a blind spot in the eye was to take a piece of paper, with two marks placed horizontally, two or three inches apart. Closing, say, the left eye, the left mark on the paper is brought opposite to the right eye, and the paper moved to and away from the face until the second mark disappears from sight, which will be when its image falls exactly upon the spot where the optic nerve enters the eye.

That there is an absolute physical limit to the size of an image which is visible is not common knowledge, but it is a fact, proved by independent experimenters, that the smallest image discernible by the retina never measures less than .001 of a millimetre. It at once occurs to you to ask how a distant star is recognised, in face of this rule; and the explanation is that the size of all luminous objects appears far greater than it should, caused by a kind of diffusion in the eye. Mr. Lambert then explained how the eye accommodated itself at will to the different planes before it. In a camera the accommodation is effected by altering the distance between the focusing screen and the image-forming lens. In the eye this is not the case, but the same effect is produced by the muscles of the eye, which flatten or thicken the lens, altering its curves and at the same time the point at which objects at a given distance come to a focus. That this was so was experimentally illustrated. In the course of the lecture many more phenomena were referred to—irradiation and other errors of judgment perpetrated by the eye—closing with a description of a simple device for reproducing Dalmayer's focometer, the practicability of which was there and then demonstrated.

# THE GUM-BICHROMATE PROCESS.

Mr. W. J. WARREN, President of the Leeds Camera Club, gave a lecture to the members on Wednesday, February 1, on "The Gum-bichromate Process of Printing."

Commencing by pointing out that this method of printing was suggested about 1850, Mr. Warren said it was allowed to fall into disuse, and some five or six years ago was revived by different workers, but chiefly by Messieurs Lefèvre, of Tours, and Demachy, of Paris. Its advantages were next dealt with, the power of control and of modification over results being emphasised. An ordinary drawing paper was sensitised with potassium bichromate, dried, coated with a mixture of gum and water-colour paint evenly on its surface, dried again, exposed to daylight under the negative, and then developed in warm water; the tissue not hardened by the action of the light washed away. By using a brush, any part of the image might be removed, or, by refraining from developing any section, it would be left in shadow. The processes of coating were demonstrated, and subsequently the lecturer developed several prints, using various means to modify the results at will. Afterwards some of the members tried their hands at development, and their efforts created an appreciation of the unique possibilities of the process. The lecturer then explained various modifications possible by the use of different papers by sizing with gelatine, starch, or arrowroot, and by various applications during development, and detailed the process of clearing and fixing, by first drying the print and then immersing in a five per

cent. solution of alum. Subsequently a number of prints, showing different results, with the same negatives, by M. Demachy, of Paris, lent, with his permission, by the editor of the *Amateur Photographer*, were handed round, and a number of questions answered. Mr. Warren finally pointed out that, whether the process he had explained be exclusively adopted by any worker or not, experiments with it would be an education on light and shade and true tone values, two subjects most important to monochrome workers in general and photographers in particular.

# LEVY-LAJEUNESSE APPARATUS FOR USING MAGNESIUM.

FIG. 1 is an elevation of the face of the apparatus shown open.

Fig. 2 is a transverse section following the line A—B of fig. 1, showing the arrangement of the apparatus on a suitably shaped foot which enables it to be adjusted at the height and inclination desired for the projection of the light upon the subject it is desired to photograph.

Fig. 3 is a transverse section following the line C—D of fig. 1.

Fig. 4 is a section similar to that of fig. 2, the apparatus being closed, that is to say, the shutters and the hammers occupy the positions which they take up when thrown out of gear and after the taking of the negative.

Fig. 5 is a fragment in plan, showing on a larger scale one of the cups for the reception of the magnesium powder.

The apparatus consists principally of a drum of cylindrical or other suitable shape in which there are placed small cups or bowls for burning the magnesium. The posterior end of this drum forms a reflector; the whole of the front face, which is uncovered before the operation, is formed of two movable shutters, which act as an obturator directly the flash is produced.

The combustion of the magnesium is effected by exploding caps by the aid of strikers the stroke of which is delivered simultaneously with the closing of the shutters and by means of one and the same disengagement or releasing mechanism. The said mechanism is actuated by the pressure transmitted to a spring by means of a simple pneumatic rubber ball which, if desired, could be made to control the shutter of the objective at the same time.

The fixed drum, 1, made of aluminium or other material—the inner surface being polished, plated, or coated so as to form a reflector—engages by means of the slides, 2, with the feet or branches, 3, of a tripod or stand which may be adjusted at the desired inclination at the head of the central supporting leg, 4, which slides into the tripod or support of the apparatus.

5 is the lower shutter, 6 the upper shutter, 7 is a cylindrical tube supported at its ends by two pivots, 8, attached to the side walls of the drum, 1—these walls forming the two bases closing the apparatus at its ends. The tube, 7, may be made to revolve with hard friction on its pivots; it carries fixed on to it, following one of its stops, a certain number of cups, 9 (shown in longitudinal elevation in fig. 1 and in plan in fig. 5). These cups are intended to receive the magnesium powder, and have in the centre a depression and points, 10, upon which a cap can be fixed.

In the centre of the tube carrying the cups there is fixed the end of a coiled spring, 11, wound round a rod, 12, placed parallel with the tube, 7, and on this there are fixed the hammers, 13, arranged opposite or over the cups, 9.

The said rod, 12, pivots on two small supports, 14, fixed to the tube, 7. The end of the recoil spring, 11, is fixed to this rod, which constantly tends to throw the hammers on to the cups, 9.

The lower shutter, 5, is governed from top to bottom by two springs, 15 and 15', fixed respectively at 16 and 16' of one of their ends to the lateral wall, corresponding to them, of the fixed drum, 1, and by their other ends to the arms, 5<sup>1</sup> and 5<sup>2</sup>, which form the lateral end walls of the shutter. These arms pivot around the shafts, 17, 17', fixed to the lateral walls of the drum, 1.

The upper shutter, 6, is governed from top to bottom by the springs, 18, 18', fixed respectively by one of their ends at 19 and 19' to the lateral walls of the drum, 1, and by their other end to the lateral walls, 6<sup>1</sup>, 6<sup>2</sup>, of the said shutter.

The shutter, 5, is engaged at one end by a staple, 20, and at the other by a hasp, 20', fixed to one wall. The upper shutter, 6, in the same way is engaged on one side by a staple and on the other by a hasp, 21', fixed to the other, 6<sup>2</sup>.

The said staples, 20 and 21, are retained respectively by the arms, 1<sup>1</sup>, 1<sup>2</sup>, of a three-armed lever, one arm, 1<sup>1</sup>, of which is fixed to one of the arms, 1<sup>2</sup>, of the spring, 11, which commands simultaneously the throwing out of gear of the shutters and that of the rod, 12, which carries the percussion hammers.

The hasps, 20' and 21', are retained by the curved branches, 1<sup>2</sup>, 1<sup>2</sup>, of another three-armed lever, *m m m'*. The arm, *m*, pivots at both of its ends around the two trunnions, *t t'*, fixed to the lateral wall of the drum, 1. On the lever, *u*, fixed to the arm, *m*, there rests the transmission shaft, 22, on which the arm, 1<sup>1</sup>, of the governing spring acts, and a recoil spring, *u'*, rests against the said lever, *u*.

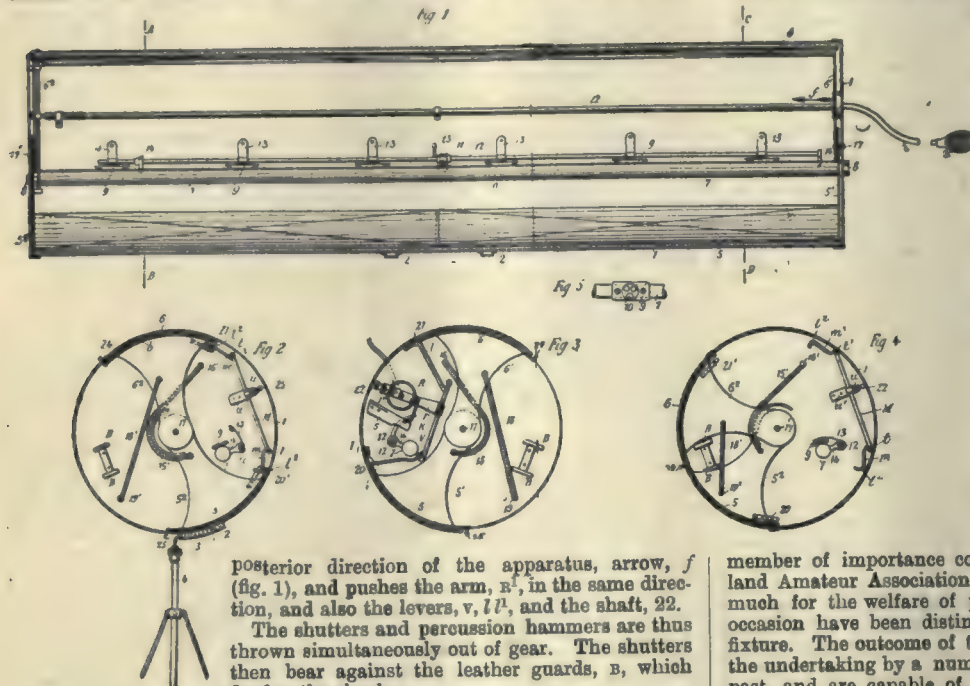
The rod, 12, on which the hammers are supported is thrown out of



gear by means of an arm, 12<sup>1</sup> (fig. 3), the end of which carries a snug, which engages against the arm, 21, fixed to the coiled spring, 2.

The action of the apparatus is as follows:—

The apparatus being in normal or out of gear position, the shutters, 6 and 5, are thrown into gear successively by placing them, by means of the knobs, 24 and 25, in a suitable position. By means of the arm, 23, the rod, 12, is made to revolve; the spring, 11, is thus stretched and the shaft being thrown into gear cocks the hammers. The shutters and shaft carrying the hammers being thrown into gear, and the apparatus placed at the desired inclination, the pneumatic ball, 26, is pressed; the current of air actuates the governing spring, which is forced in the



posterior direction of the apparatus, arrow, *f* (fig. 1), and pushes the arm, 21, in the same direction, and also the levers, *v*, *l*<sup>1</sup>, and the shaft, 22.

The shutters and percussion hammers are thus thrown simultaneously out of gear. The shutters then bear against the leather guards, *b*, which deaden the shock.

Thus it will be seen that the more essential features of the invention are the three-armed springs, *r*, *b*, *r*<sup>1</sup>, the central arm of which is actuated by a current of air and carries an arm, 21, to throw the shaft carrying the percussion hammers out of gear; the arm, *u*, of this spring actuates a lever, *l*, *v*, *l*<sup>1</sup>, to disengage the shutters at one of their ends, and the arm, *r*<sup>1</sup>, is connected with a shaft, 22, bearing on the arm, *u*, of the lever with three arms, *m*, *x*, *m*<sup>1</sup>, which revolves so as to throw the shutters out of gear at their opposite end.

#### NOTES FROM THE WEST OF SCOTLAND.

THE visit of Mr. Harold Baker to Glasgow was looked forward to with much interest by several of Glasgow's local professionals, especially those more particularly engaged in the portraiture branch of photography.

Mr. Baker was brought to Glasgow under the auspices of the Glasgow Photographic Society (the parent of all the newer associations that have been formed during the last fifteen years). As the increase of amateur photography in the west of Scotland set in, it is noticeable that a distinct decline ensued in the popularity of the old parent Society, an association which has always been more or less under the governing hand of local professionals. Quite recently, the attendance at their regular monthly meetings may be said to have reached the vanishing point.

It was, no doubt, in the hope of giving a fillip to the existing state of affairs that the Council of the Glasgow Photographic Society sent an invitation to Mr. Baker to come north, for a pretty wide circle of invitations were sent out for the occasion, so that a warm and well-attended meeting might welcome that gentleman on Thursday night last. The large hall of the Philosophical Society was specially engaged also for the occasion, as showing the expectancy of those who had made the arrangements for the event, but unfortunately "The best-laid schemes o' mice and men gang aft a-gley," for, notwithstanding all the attempts that were made, only a mere handful turned up to welcome the popular portraitist, probably not more than twenty putting in an appearance. Those, however, that did attend had no reason to regret it, for Mr. Baker gave a most interesting lecture on several points connected with portraiture that were greatly appreciated by the professionals that it was specially applicable to.

It seems strange that there should not have been a better response on the part of both amateurs and professionals in and around Glasgow to an event of this description. Had any of our local popular lecturers been

billed to give a mere limelight lecture, it is a certainty the large hall would have been full to overflowing, and evidently technical lectures at the moment at least, so far as the west of Scotland is concerned, are not appreciated by professionals. On the other hand, with our amateur societies overflowing houses are the order of the day when any of our prominent local professionals give their demonstrations, to wit, the last meeting of the Glasgow and West of Scotland Amateur Association. Do professionals think they are above being taught, or has that common course of cliquism entered into photographic circles in Glasgow?

Already those interested in the forthcoming International Exhibition in Glasgow are beginning to discuss the matter of any monopoly being accorded for the right of photography inside the Exhibition. It is felt that, should any sole rights be given to any one firm in the matter, a great injustice would be done to the thousands upon thousands of tourists who will visit Glasgow during the run of this great function. On the last occasion monopolies were granted; but since then the hand camera has been instituted, and if every lady or gentleman who possesses a hand camera, and is desirous of using the same during their visit to the show, should be debarred in this respect, then a great injustice would be done to photographers generally throughout the entire world. It is hoped that the Council of the Exhibition will see that no such monopoly be given to any one, but some arrangement be come to—such as, for the payment of a mere nominal fee, any one can acquire permission to photograph on any one day within the precincts of the Exhibition. It is to be regretted that already a very strong expression of feeling has been made against the constitution of the Photographic Section of the Fine Arts Committee connected with this Exhibition, there not being a single

member of importance connected with the Glasgow and West of Scotland Amateur Association upon the same, and gentlemen who did so much for the welfare of photography and the Exhibition on the last occasion have been distinctly slighted and passed over for the coming fixture. The outcome of this will undoubtedly be the holding aloof from the undertaking by a number of those who have done so much in the past, and are capable of still doing so much in the future, to make or mar an event of such importance.

#### SCHUCKERT'S CIRCULAR SHUTTER FOR OPTICAL REFLECTORS, PROJECTING LANTERNS, AND ANALOGOUS APPLIANCES.

THE special applications of reflectors, electrical projecting lanterns, and analogous appliances render it desirable to provide devices for rapidly and completely obscuring or intercepting the conical bundle of rays emanating from the same, so that they may be set out of action without extinguishing the source of light or breaking the electric current which produces it. The devices hitherto employed for this purpose suffer from the defect that they allow light to pass through, or that they are injured by the heat rays concentrated upon them.

The present invention has for its object to provide an obscuring or intercepting device for circular openings, especially those of reflectors, which device has some resemblance to the well-known iris shutters of photographic cameras, and which, besides fulfilling the requirements mentioned above, can be handled with ease, rapidity, and certainty, and is therefore suitable as a signalling device.

Figs. 1 to 3 are diagrams of the improved shutter in different stages of operation, and fig. 4 is an axial section of the same on a larger scale, so as to show the details of construction.

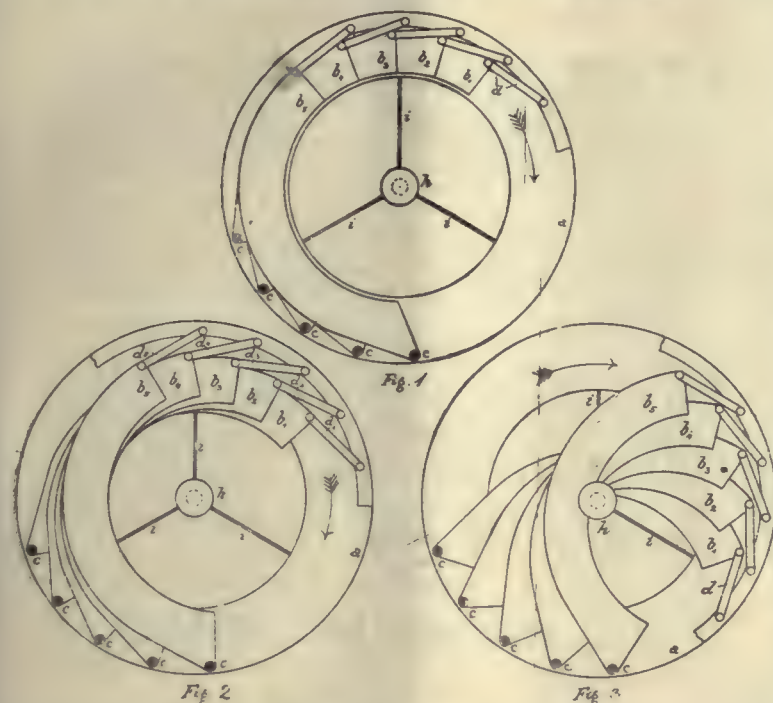
The shutter chiefly comprises an annular frame, *a*, of such a size that it can be mounted in the opening to be obscured; a set of sickle-shaped segments, *b*<sub>1</sub>, *b*<sub>2</sub>, *b*<sub>3</sub>, *b*<sub>4</sub>, *b*<sub>5</sub>, of sheet metal or other suitable material, arranged round the inner circumference of the said frame, each segment being pivoted at one end on a stud, *c*, and connected at the other end by a short link or guide bar, *d*<sub>1</sub>, *d*<sub>2</sub> to *d*<sub>5</sub>, to a ring, *e*, adapted to turn on the axis of the frame; *a*, a ring, *e*, as mentioned above, mounted on balls, *f*, and provided with a handle, *g*, for turning it; a roller, *h*, fixed in the centre of the ring, *e*, and coaxial with the same, said ring being provided with a deep circumferential groove, *k*, and secured in its position by three suspension wires, *i*, placed at 120° to each other, or by other suitable means.

The width of the groove, *k*, increases from the centre towards the circumference of the roller, as shown in fig. 4.

When the shutter is fully open, as represented by fig. 1, the segments, *b*<sub>1</sub> to *b*<sub>5</sub>, partly overlap each other, and form a ring composed of several layers, because the entire circumference of the frame, *a*, is



provided with such segments. If the ring, *c*, connected with the segments,  $d_1$  to  $d_5$ , by the links, *d*, is turned in the direction of the arrow, the various segments are forced to approach the axis of the frame, *a* (fig. 2). During this time the circular opening formed by the segments is gradually getting smaller, until the segments slide into the groove, *k*, formed by the roller, *h*, and abut against the axle or core of the same, while they are firmly pressed against each other (fig. 3). As the various segments overlap each other, without forming any clearance, this opening of the frame, *a*, is completely obscured. In the case of electrical



reflector lamps, the roller, *h*, in the axis of the reflector, has little or no effect on the optical effect, because the central part is already inoperative, owing to the shadow of the negative carbon falling upon the same.

In cases, however, where the loss of light in the axis of the shutter must be avoided, the stationary roller, *h*, may be replaced by a movable roller fixed to the centre of one of the segments, *b*. For opening or closing the shutter, the ring, *c*, need not be turned more than 90°, as shown by experience, but the same effect may be obtained by turning the ring, *c*, only 45°, if the frame, *a*, carrying the pivots of the segments, is adapted to turn also, and in a direction opposite to that of the ring, *c*.

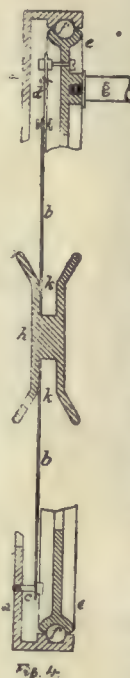
#### EDINBURGH PHOTOGRAPHIC SOCIETY'S ANNUAL EXHIBITION.

On February 4, the Annual Exhibition of the above Society was opened in their rooms, 38, Castle-street, by the Lord Provost of the City of Edinburgh, when there was a large attendance. The Lord Provost expressed his pleased surprise at the high artistic quality of the work shown, and highly commended the members for arranging such an Exhibition. An attractive musical programme, arranged by Mr. J. C. Lennie, was submitted and received with approval.

The Exhibition, which will remain open until February 25, contains 310 exhibits, a slight increase on last year; but the quality also shows a decided advance, and we think the Society may congratulate itself on having surpassed themselves this year. It might also be mentioned, *en passant*, that the membership of the Society is steadily on the increase, seventy members having been elected since October 1. Three gold medals have been offered this year against one last year, and in spite of the large increase in the number of non-members competing in the open classes, these gold medals (one was confined to members) have been carried off by members. The Judges were Messrs. Alexander Roche, A.R.S.A., Craig Annan, F.R.P.S., and W. M. Warneke, F.R.P.S., and while it would not be correct to say their verdict had given universal satisfaction—that is impossible—still, on the whole, the grumbling is only slight.

The Landscape, Seascape, and Architecture (open to all) classes contains fifty-eight exhibits. Here James Patrick, Edinburgh, an ex-President of the Society, gains the gold medal, with a beautiful view of Swanson, famous in the annals of Robert Louis Stevenson, whose haunts, as we mentioned in *Before the Convention*, Mr. Patrick had so fully illustrated.

The photograph, like its title—*A stilly hame! home, that viss with an earthly paradise*—is poetic in treatment, and perfect in technique; perhaps fault might be found with the mount and frame, but it is a thoroughly good photograph, and Mr. Patrick well deserves his win. The silver medal goes to Ernest G. Boon, Allassis, for *On the Lagoons*, a pretty example of Mr. Boon's well-known Venetian work; mounted on rough white paper, it almost looks like an old and well-preserved engraving. *Evening on the Chase*, which takes third place, would at once be recognised as one of W. Smedley Aston's work, quiet and restful in tone; it is a picture that



can be returned to again and again. In this class also might be mentioned, although no certificates have been awarded, *Ceiling at Thulestone Castle, Lander, A.D. 1675*, by Viscount Maitland. This is an almost perfect example of photographic technique. A very large example of F. H. Worsley Benison's work, with a poetic title, is in No. 2, but the enlargement is evidently too much, for the flying foam more resembles wool than water. *A rift in the Clouds* comes all the way from Kirkwall, but the lighting on the waves is hard, and the rays of light in the sky have too much of a faked appearance. In *South Door, Fountains Abbey*, John Stuart, Glasgow, has a good example of his well-known architectural work. In *Winter*, John Moffat, Edinburgh, shows a snow-laden view of St. Cuthbert's Parish Kirk and the Castle that should be popular with Edinburgh folks. *An Autumn Pastoral*, by Robert Ayton, is a good idea, and the composition is good, but it might and probably will be still further improved.

In Class II. (Portraiture, Figure, and Animal Studies, open to all) there are sixty-four entries. The gold medal is awarded to John Warrack, junr., for *Pietro*. This is a photograph that not a few members think wants its position explained. Plenty of condemnatory remarks will be made; we heard several. Let us try to find a good point or two. The photograph is distinctly impressionistic, and is not meant for microscopic inspection; but, viewed from the proper distance, it will be noted the pose is striking and not unnatural; there is a roundness and fleshiness about the arms and face and a depth about the picture that are destroyed by an unintended

close inspection. The Judges have probably judged it by the evident intention of the photographer, and added a point or two for its originality. Mr. Wm. Crooke, Edinburgh, takes the silver medal with his well-known portrait of *The late Sheriff J. Comrie Thomson, Q.C.* This picture is well known in London, and has in the figure a restful dignity befitting his office. The bronze medal goes to Mr. Robert Ayton, Edinburgh, for *Mistletoe Reflections*, representing a sweet little lassie "in maiden meditation, fancy free," moralising over some mistletoe; the pose is natural, and the result charming. *The Smithy*, by Mr. J. B. Johnston, gains a certificate; the light is finely managed, and the whole picture hangs well together. James Patrick shows a good thing here in *Light at Eventide*, an old lady reading at the cottage window. *A Pair of Elves* and *A Dangerous Pastime* are two photographs of nude children that will attract few admirers. In this class some splendid work is shown, but it is impossible in the space at our command to deal with it all. A few names might be mentioned, however: Messrs. John Moffat, John Stuart, Chas. M. Waue, R. S. Webster, Ernest G. Boon, Chas. Sweet, John C. Warburg, John Gunston, W. Smedley Aston, Wm. Norrie, W. Fisher Ward, &c.

In the confined-to-members the prize (gold medal) for the best photograph by an amateur member was gained by Mr. Alex. Allen with *Mary*. This is a portrait of the same old lady as he took premier honours with last year under the title of *Martha*, and the scheme of lighting is much the same, strong light on the profile of the face and the rest of the picture more suggestive than illustrative. It is an example of what is popularly known as Rembrandt lighting, and might be called a "strong" picture.

In Class III. Miss G. M. Gray takes first place with *A Shady Dell*, a fine woodland composition, slightly spoiled by two modern figures.

In Class IV. a strong portrait of *Rev. Dr. Whyte, Free St. George's*, by Mr. John Warrack, junr., takes the silver medal. The characteristic features of the reverend Doctor are powerfully portrayed.

Class V., Hand-camera Work, sees Mr. W. J. Croall in first place with two of his well-known sporting studies and a photograph of *White Bantams*.

Class VI., Landscape, &c. (open to amateur members), has about fifty entries, first place being taken by a small print of *The Last Load*, by Mr. Alex. Allan, the action of the figures being probably the strong point.

Class VII., Figure Studies, &c. (amateur members).—Here, as already mentioned, *Mary*, by Mr. Alex. Allen, takes pride of place. *Toilers of the Shore*, by Mr. Jas. Burns, takes the bronze medal, and carries out



title well. Miss Christian H. Curle has a beautiful picture of *Brier Roses* in this class.

#### LIST OF AWARDS.

Class I. (open to all), Landscape, Seascape, and Architecture.—Gold medal, Mr. James Patrick, Edinburgh; silver medal, *On the Lagoons*, Mr. Ernest G. Boon, Allasio; bronze medal, *Evening on the Chase*, Mr. W. Smedley Aston, Birmingham.

Class II. (open to all), Portraiture, Figure, and Animal Studies.—Gold medal, *Pietro*, Mr. John Warrack, junr.; silver medal, *The late Sheriff J. Comrie Thomson*, Mr. W. Orceke, Edinburgh; bronze medal, *Mistletoe Reflections*, Mr. Robert Ayton, Edinburg; certificate, *The Smithy*, Mr. J. B. Johnston, Edinburgh.

Class III. (open to members), Landscape, Seascape, and Architecture.—Silver medal, *A Shady Dell*, Miss E. M. Grey; bronze medal, *A Wreck*, Mr. Alex. Allan; certificate, *By the Sand Dunes*, Mr. W. J. Croall; *In the Woods—Summer*, Mr. John Warrack, junr.

Class IV. (open to members), Figure or Genre, including Animals and Still Life.—Silver medal, *Riv. Dr. Whyte, Free St. George's*, Mr. John Warrack, junr.; bronze medal, *A Symposium*, Mr. W. E. Drummond Young, certificates, *A Village Worthy*, Miss E. M. Grey; *The Miller's Man*, Mr. Alex. Allan.

Class V. (open to members), Set of pictures, not exceeding three, being work done by camera held in the hand.—Silver medal, *Getting near the Birds, White Bantams, A Close Point*, Mr. W. J. Croall; bronze medal, Mr. J. Yate Thomson; certificates, Mr. J. C. McKechnie; Mr. Alex. Allan.

Class VI. (open to amateur members only), Landscape, Seascape, and Architecture, up to and including half-plate.—Silver medal, *The Last Load*, Mr. Alex. Allan; bronze medal, *Requiescat in Pace*, Mr. James Burns; certificates, Mr. J. Yate Thomson and Mr. James Hay.

Class VII. (open to amateur members only), Figure or Genre, including Animal Studies and Still Life, up to and including half-plate.—Silver medal, *Mary*, Mr. Alex. Allan; bronze medal, *Toilers of the Shore*, Mr. James Burns; certificates, Mr. John Warrack, junr., and Mrs. Norman D. Macdonald.

President's gold medal for best picture in the Exhibition, the work of an amateur member:—*Mary*, Mr. Alex. Allan.

#### SOUTHSEA AMATEUR PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE Eleventh Annual Exhibition of the above Society was held at the Society's rooms, 5 Pembroke-road, Portsmouth, on January 30 and 31. The Society is fortunate in having a splendid suite of rooms, very large and commodious and well lit, and therefore can have its annual Exhibition on its own premises. This year, however, the holding capacity of the rooms, large as they are, was taxed to the utmost, the Exhibition being quite the finest both in point of numbers of pictures hung (about 600), and the excellence of the work shown. The rooms were thronged throughout the two days with crowds of people, and the opinion of every one has been that it is decidedly the best show of its kind ever held in the district, and will probably do much to foster the photographic art in Portsmouth, even if its influence will not be more widespread. Of course, the introduction of Open Classes has had a lot to do with the success of this year's Exhibition, and some exceedingly fine work was submitted, and the Judges, Messrs. H. Snowden Ward, H. Symonds, and Dr. F. Lord had their work cut out in making their selection.

The following is the list of awards:—

#### MEMBERS' CLASSES.

Class A (Landscape).—1. *A Fallen Brother*, Mr. H. T. Lilley, M.A. 2. *A Country Road*, Mr. Gilbert Wood. 3. *Yealmtown, Devon*, Mr. H. J. Hissett.

Class B (Seascape).—1. *Barfleur Harbour*, Mr. F. J. Mortimer. 2. *Penlee Point, Cornwall*, Mr. H. J. Hissett. 3. *View from Piazza, Venice*, Mr. A. Fisher, A.S.A.

Class C (Figure).—1. *The Morning Paper*, Mr. H. T. Lilley, M.A. 2. *At Selsea*, Mr. F. J. Mortimer. 3. *Myself*, Colonel E. J. de Salis.

Class D (Architecture).—1. *Bonchurch*, Mr. Gilbert Wood. 2. *Part of Forum, Rome*, Mr. A. Fisher, A.S.A. 3. *At Wymering*, Major-General W. Byam, C.B.

Class E (Local Views).—Bronze medal, Mr. F. J. Mortimer.

Class F (Enlargements).—1. *A Hampshire Farmer*, Mr. F. J. Mortimer. 2. *Regatta at Helford*, Mr. F. A. Hedge.

Class G (Lantern Slides).—1. Set of six, Mr. A. Fisher, A.S.A. 2. Set of six, Mr. F. J. Mortimer. 3. Mr. E. H. Purvis and Colonel E. J. de Salis.

#### OPEN CLASSES.

Class H (Landscape).—1. *At Littleington, Sussex*, Viscount Maitland. 2. *The Waning of the Day*, Mr. G. Walford. 3. *Launching the Lifeboat*, Mr. Graystone Bird.

Class I (Figure).—1. *Head Study*, Mr. Pirie Macdonald, U.S.A. 2. Viscount Maitland. 3. *Meadow Maiden*, Messrs. G. Chaffin & Sons.

Class J (Hand-camera Work).—1. Set of six pictures from Venice, Dr. E. Boon (Italy). 2. Set of six Hand-camera Studies, Mr. W. Fisher-Ward. 3. Set of six Hand-camera Studies, Mr. Walter D. Welford.

Class K (Lantern Slides).—1. Set of six slides of Lightning, Mr. W. Archibald, U.S.A. 2. Set of six slides of Flowers, Mr. W. E. Cowan. 3. Set of six slides of Yachts, Mr. A. Watson. Extra bronze medal for set of six slides of Agricultural Subjects, Mr. E. R. Bull.

The awards in each case are: 1, Silver medal; 2, bronze medal; 3, certificate.

#### THE BENEVOLENT COMMITTEE.

THE Committee appointed by the Photographic Club, under the instructions of the Registrar of Friendly Societies to deal with the funds of the Photographic Benevolent Association, which has now been wound up, held its first meeting on January 31.

Mr. H. Vivian Hyde, of 33 Ritherdon-road, Upper Tooting, S.W., consented to act as Honorary Secretary, Messrs. J. Spiller and T. Fall as Trustees, and Mr. A. Mackie as Treasurer.

After settling several matters with regard to the procedure to be followed, an application for assistance was considered from a lady photographer who had several relatives dependent upon her, and whose case had been previously before the Committee of the P.B.A. It was agreed that a sum not exceeding 80l. should be devoted to releasing her from her difficulties.

The Committee next considered the case of an orphan, aged 4½ years, whose father was a photographer who had held situations in several first class firms. It was desired to place the child in a Home where she would be educated at a cost of 10l. per annum for 10 years, and a gentleman who had interested himself in the case had promised to contribute half the necessary amount provided the Committee would find the other half. It was decided to do this, and the Hon. Secretary was instructed to inquire upon what terms an annuity could be obtained from an assurance office.

An application from a photographer in the Midlands was referred back for further information and references.

## Our Editorial Table.

#### DEKKO PAPER.

Manufactured by Kodak, Limited, 43, Clerkenwell-road.

MESSRS. KODAK, LIMITED, are introducing a new photographic printing paper to be known as Dekko paper, the special feature of which is that it can be exposed, developed, and fixed in an ordinary room illuminated by artificial light or weak daylight. It is made in four varieties: Glossy, which has a surface similar to Solio P.O.P., and gives fine detail; matt, which has a fine-grain, velvety matt, mauve-tinted surface; egg-shell matt, which is a fairly heavy white paper, with a matt surface, showing a pleasing irregular grain; matt antique, which is an antique cream-tinted paper with a surface like hand-made paper. Richness of colour and breadth of effect are noticeable qualities given by this paper. Any developer can be used with the paper, and Eastman's special developer cartridges are well suited for use with it. A great variety of results may be obtained on Dekko by alterations in the time of exposure and development. Long exposure and development with dilute developers tend to give warm blacks, while short exposure and longer development with stronger developers produce blue-black tones. A range of tones varying from red chalk, through sepia and brown, to purple black, may be obtained by printing in daylight until the deepest shadows are faintly visible, and then developing with the "warm-tone" developer. This method will yield a red-brown colour. For brighter reds a longer exposure should be given, and purples are obtained by shorter exposures.

The following are the principal directions for use:—

Dekko paper may be safely handled for the purpose of placing in the printing frame and developing at a distance of eight or ten feet from ordinary full-flame artificial light, or three or four feet away if the light is turned low. With the Welsbach gaslight or daylight it is necessary to reduce the light somewhat by shading the lamp or window with one thickness of thin orange paper; if there is a yellow shade or dark shade on the window, the orange paper need not be used.

To expose, place the paper in contact with the negative in the printing frame. Make the exposure while holding the printing frame at a distance of about six inches from an artificial light, or two feet from a window, covered with one thickness of tissue paper. Length of exposure varies with the density of the negative and the strength of the light. With artificial light, using the same negative, the various rates may be approximately compared as follows: Welsbach incandescent gaslight, strongest; incandescent electric light, about one-half as strong as the Welsbach gaslight; ordinary gaslight, slightly weaker than the incandescent electric light; oil lamp of ordinary size, about one-third the strength of an ordinary gas burner. With a negative of medium density,



expose three to five minutes at a distance of from six to eight inches from an ordinary gas burner.

*Metol-hydroquinone Developer.*

Metol .....	8 grains.
Hydroquinone .....	30 "
Sulphite of soda (cryst.) .....	$\frac{3}{4}$ ounce.
Carbonate of soda (cryst.) .....	$\frac{3}{4}$ "
Water .....	10 ounces.

Dissolve and add to each ounce of developer about 2 drops of a solution composed of—

Bromide of potassium .....	$\frac{1}{2}$ ounce.
Water .....	5 ounces.

This developing solution is to be used without dilution.

To obtain a series of tones varying from red chalk, through sepia and browns, to a purple black make up the following developer :—

No. 1.

Citric acid .....	2 $\frac{1}{2}$ ounces.
Ammonium carbonate .....	1 ounce.
Water .....	10 ounces.

No. 2.

Sulphate of iron .....	2 $\frac{1}{2}$ ounces.
Water .....	10 "
Sulphuric acid .....	10 drops.

For use mix three parts of No. 1 with one part of No. 2.

Expose the print for three or four seconds to daylight until the image is just visible in the deepest shadows. This will, upon development, give a red-brown colour. For brighter reds give a longer exposure, while for purples expose for a shorter period.

First immerse the prints for a few moments in water, then pour off the water and flow over either of the above developers. The image will appear almost immediately, and, when it is sufficiently developed, rinse quickly and immerse in the following fixing bath :—

*Fixing Bath.*

Hyposulphite of soda .....	4 ounces.
Alum (crystals) .....	1 ounce.
Water .....	16 ounces.

Fix for fifteen minutes, keeping the prints separated. When fixed, transfer to the washing tray.

THE CADETT P.O.P.

Manufactured by Cadett & Neall, Ashted, Surrey.

In addition to the "soft" brand of P.O.P., a sample of which we tried some weeks ago with the greatest success, Messrs. Cadett & Neall are issuing another variety termed the "brilliant" brand. The characteristics of this surface are that it allows of prints of very great brilliancy being obtained, and that therefore it is especially suitable for portrait negatives. A brief trial of the paper convinces us that it is admirably adapted for the special purpose for which it is prepared, and we have no doubt that it will be exceedingly popular with professional photographers. We congratulate Messrs. Cadett & Neall not only upon the excellent qualities of their printing-out papers, but also upon their shrewdness and foresight in catering for the tastes of the photographic public, among whom, if our opinion counts for anything in the matter, gelatino-chloride is destined to have quite as long a run as albumen.

GRAVURA.

Manufactured by the Paget Prize Plate Company, Watford.

THE Paget Company have sent for us trial samples of their new gaslight development paper, which we hope to fully report on next week. A series of specimen prints made on the paper lies before us; these have a wide range of colour—red, sepia, brown, purple-black, black—a feature which should render the paper exceedingly popular, the colours being obtainable by exposure and development alone, and not by toning.

CATALOGUES RECEIVED.

W. F. Slater, 169, Southampton-street, Camberwell, S.E.

MR. SLATER is shortly removing to more commodious premises, and sends us his eight-page list of second-hand apparatus, which he is desirous of clearing off. A glance through the list shows that many bargains are available. From the prices quoted a reduction of ten per cent. is allowed. The list should be in the possession of all those on the look-out for "cheap lines" of second-hand apparatus and sundries.

Sands, Hunter, & Co., 20, Cranbourne-street, Leicester-square, W.C.

In their latest second-hand list, which Messrs. Sands, Hunter, & Co. have sent us, a wide variety of hand cameras finds detailed reference, nine pages being devoted to those instruments. Tourist and studio cameras follow, and of lenses, portrait, euryscope, rectilinear, wide-angle, landscape, casket, triplets, and stereoscopic form an assortment probably not to be found in any other catalogue of this nature. Complete sets, lanterns, changing boxes, shutters, and miscellaneous make up the remainder of the catalogue, which extends to thirty-two pages, and should tempt all those who love a bargain in second-hand photographic apparatus to procure a copy. As a source of such purchases, as well as for the hire of apparatus, Messrs. Sands, Hunter, & Co. have long enjoyed a well-deserved reputation of the highest kind.

Ross, Limited, 111, New Bond-street, W.

Two supplementary lists have recently been issued by Messrs. Ross; these treat of the Company's latest novelties in photographic and lantern apparatus, lenses, microscopes, &c. We note that prominent mention is given to a new lens, called the Ross Symmetric Anastigmat, the principal characteristics of which are thus outlined :—

This new Extra-rapid Series is introduced to provide an improved lens replacing the Universal Symmetrical Series, with only a very small increase in cost of the larger sizes. Like the Universals, these new lenses work with an intensity of  $f-5.6$ , but with superior marginal definition. They are spherically and anastigmatically well corrected over the whole field, and, wider angles being embraced when smaller apertures are employed, they may be considered universal in their adaptability. They are extremely suitable for studio work and for portraits and groups out of doors. When adapted to cameras provided with focal plane or other very rapid shutters, these lenses will also be found invaluable for animal studies, racing pictures, street scenes, and other work requiring instantaneous exposures.

The three smaller sizes will be found adapted for hand-camera work. When stopped down to slightly smaller apertures, they are suitable for all kinds of general photography, including copying and enlarging.

The Birmingham Oxygen Company, Limited, Saltley Works, Birmingham.

THIS Company not only supplies compressed oxygen for medicinal and other purposes, but also pure hydrogen, coal gas, nitrous oxide, carbonic acid, and compressed air, the uses of which are many. Apparatus for the production of liquid air is also listed. With photographers and others interested in optical projection Brin's oxygen has long borne the highest reputation. This list should be obtained by all who employ compressed gases. The Company point out that, next to its value as a medicine, the most important applications of compressed Brin's oxygen are the result of its property of yielding with common coal gas the highest temperature produced by flame, enabling an intense and easily regulated "local" heat to be produced. The most popular of its uses is due to this property, and is the "limelight" chiefly used for optical lanterns and stage effects. Other important uses are the oxygen blowpipe (for melting platinum, for very fine brazing in jewellers', cycle, and engineering work generally, and for lead-burning in chemical and gas works), and also the oxygen injector furnace for rapidly melting small quantities of the most refractory ores—gold, silver, and other precious metals. Prices of cylinder fittings, and many useful, practical hints are included in the list.

\* \* Owing to the heavy demands on our space this week we are compelled to hold over a portion of Editorial Table.

## News and Notes.

THE YORKSHIRE EXHIBITION.—The total attendance at this Exhibition, which closed on the 31st ult., was 125,903. Sixty seven photographs, value 100*l.* 4*s.*, were sold.

THE Brentford Photographic Society proposes holding an Exhibition on March 15 and 16. It has been decided to have an open class, and Mr. John A. Hodges has kindly consented to act as Judge.

PHOTOGRAPHIC CLUB.—Wednesday evening, February 15, at eight o'clock. Beginners' Night. "Toning and Modifying Prints after Development," by W. Ethelbert Henry, C.E. Visitors will be welcome to these demonstrations.

MR. HOOLE'S lecture on "Lantern-slide Making," which we published in our SUPPLEMENT last week, was read before the Croydon Microscopical and Natural History Club, and not before the Sutton Photographic Club, as stated.

MESSRS. ELLIOT & FRY have just been awarded the gold medal for their charming exhibit of photographic enlargements at the recent Grosvenor Exhibition, which included portraits of the Queen, Sir Alfred Milner, Mr. Rhodes, and several typical English beauties.



**THE Thornton Heath Polytechnic Photographic Society** has recently been formed. The principal officers are:—*President*: Dr. Fowler.—*Committee*: Messrs. B. E. Edwards, Ironmonger, Bynoe, Chatwood, Watson, Duff-Smith, W. H. Rogers, Robertson, G. S. Addison and Swale.—*Hon. Treasurer*: Mr. Gardner.—*Hon. Secretary*: Mr. V. Smith.

**THE Fourth Annual Smoking Concert** of the *employees* of Mr. Jonathan Fallowfield will be held at the London Tavern, Fenchurch-street, E.C., on Friday, February 17, at 7.30 p.m. Mr. F. W. Hindly will preside. An interesting and attractive programme of nearly thirty items has been arranged, and, as on former occasions, an enjoyable evening should result.

**THE West London Photographic Society's Tenth Annual Exhibition of Members' Work** will be held on Friday and Saturday, February 17 and 18, 1899, at the Broadway Lecture Hall, Hammersmith, W. It will be open to members and their friends by invitation card on Friday, February 17, 7 p.m. to 10 p.m., and to the public free on Saturday, February 18, 4 p.m., to 9 p.m. There will be an exhibition of lantern slides each evening.

## Patent News.

THE following applications for Patents were made between January 23 and January 28, 1899:—

**COLLOTYPE PRINTING MACHINES.**—No. 1494. "Improvements in Collotype and similar Printing Machines." A. COE.

**DARK SLIDES.**—No. 1527. "Improvements in Photographic Dark Slides." G. R. NICHOLLS.

**MECHANICAL SLIDE.**—No. 1617. "A New or Improved Mechanical Slide." E. APPELBY and A. C. THOMAS.

**LENSES.**—No. 1699. "Improvements in certain Photographic Lenses." Complete Specification. H. D. TAYLOR.

**OPTICAL PROJECTION.**—No. 1802. "Improvements in the Means of Viewing the Enlarged Pictures obtained by Optical Projection." J. E. THORNTON and C. F. S. ROTHWELL.

**PROJECTING ANIMATED PHOTOGRAPHS.**—No. 1815. "Improvements in Apparatus for Projecting Animated Photographs on to a Screen." E. T. SAUNDERS.

**HAND CAMERA.**—No. 1818. "The Landore New or Improved Hand Camera." Complete Specification. E. ALAND.

**STEREOSCOPIC PHOTOGRAPHY.**—No. 1964. "Improvements in relation to Stereoscopic Photography." J. E. THORNTON.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
11.....	Oroydon Camera Club .....	Lantern Show.
13.....	Bradford Photo. Society .....	(Demonstration: Bromide Enlarging. A. Priestley.
13.....	Camera Club .....	Exhibition of Members' Lantern Slides.
13.....	Kingston-on-Thames .....	(Popular Artists of the Day. Kindly lent by Sir George Newnes & Co., Ltd.
13.....	Leigh .....	Prize Slides.
13.....	Oxford Camera Club .....	(Lecture: Practical Points in Exposure, Development, and Printing.
13.....	Richmond .....	Modern Methods of Book Illustration. Ernest Morgan.
14.....	Birmingham Photo. Society .....	Demonstration: Platinotype Printing. W. T. Greatbatch.
14.....	Hackney .....	Paper by E. J. Wall.
14.....	Leeds Photo. Society .....	Instantaneous Photography. H. B. Buckley.
14.....	Shropshire .....	Description of Apparatus for taking Photographs of Minute Objects with the Aid of the Microscope. F. E. Armytage.
15.....	Ashton-under-Lyne .....	Affiliated Societies' B Set of Slides. Reader, Thomas F. Kershaw.
15.....	Brentford .....	Spotting, Retouching, and Mounting. Mr. Abbott.
15.....	Oroydon Camera Club .....	Hand-camera Work. G. H. Gear.
15.....	Leeds Camera Club .....	The River Wharfe from Source to Mouth. F. Brundritt.
15.....	Photographic Club .....	Toning and Modifying Prints after Development. W. Ethelbert Henry, C.E.
15.....	Southsea .....	Some Practical Points in Photography. F. J. Mortimer.
15.....	Woodford .....	Colours in Lantern Slides. E. Marriage.
16.....	Bolton Mutual Photo. Society .....	Ramble through Land. Rev. J. J. F. Halliway.
16.....	Camera Club .....	Experiences at the Court of the Ameer. A. G. Gray, M.B.
16.....	Goldsmiths' Institute .....	The Camera and the Wheel. F. O. Bynoe.
16.....	Leigh .....	Competition: Picture, Morley Hall.
16.....	Liverpool Amateur .....	Demonstration: Development. F. Anyon.
16.....	London and Provincial .....	Lantern Night.
16.....	Putney .....	Elementary Carbon Printing. T. Coyah.
17.....	Oroydon Microscopical .....	Lantern Slides. Mr. Sandell.
17, 18 .....	West London .....	Annual Exhibition.
18.....	South London .....	Exhibition Entries close.

**Hackney Photographic Society.**—January 31, Mr. W. L. Barker presiding.—The subject for the evening was a lecture by Mr. J. H. GEAR on

### PICTORIAL WORK.

In speaking of field work, he said that the photographer should keep his eyes open and be ready to photograph any pleasing composition he might see, and not go out merely with the idea of looking for some particular class of subject; in other words, he should not seek for a picture to fit a title, but should find his title to suit the picture. It was a good plan to include in the field kit a broad pencil and some paper, and, when a likely subject met the eye, the lines of it should be sketched on the paper. This was a surer method than the mere observation of the focussing screen, for the inversion of the picture and the colour were deceiving. Having drawn a rough outline of the subject, it could easily be seen whether the composition were faulty or not; should it be faulty, it could easily be seen in what respect it was bad, and a remedy might be suggested in the alteration of the position of the camera or the use of a lens of a different focus. With regard to the question of focussing sharply or otherwise for pictorial work, the lecturer preferred to get all parts of his negative sharp, and to get whatever diffusion of focus he might want by interposing one or more sheets of celluloid between the negative and the print. In the course of the lecture he dealt fully with the subject of the after-treatment of the negative, and showed by means of samples how much of this was often necessary to get good results. He advised all would-be pictorial photographers to obtain a good stock of cloud negatives, for, even if the clouds were obtained on the same plate as the landscape, it would rarely be suitable from a pictorial point of view. Mr. Gear ended a very able lecture with an explanation of combination printing.

**Lewisham Camera Club.**—January 24.—A demonstration was given by the Hon. Secretary (Mr. Eastwood) on the

### REDUCTION AND INTENSIFICATION OF NEGATIVES.

He described the class of negatives which would be benefited by reduction, as those which having had a sufficient exposure had been over-developed, also those which, having been over-exposed, had been over-developed in the hope of obtaining density, but where the result had been fog these latter requiring clearing, and afterwards intensification. He showed how apparently hopelessly spoiled negatives in which the image was almost invisible could be restored to usefulness, and also brought specimens of weak, flat negatives, half of each having been previously bleached with mercury, and which he then intensified before the meeting, and passed round to show the improvement produced on the half-treated. Reference was made to the introduction of the new salt, persulphate of ammonia, by Messrs. Fuerst, Brothers, and to its unique property of attacking and reducing the densest portions of a negative in preference to the weaker details, and he experimented upon several hard chalky negatives, showing its value in this respect.

**North Middlesex Photographic Society.**—January 30, Mr. H. Walker in the chair.—Mr. H. Stuart (Hon. Secretary) gave a demonstration on

### LANTERN MANIPULATION.

He said that this was a novel subject with which to fill up an evening, but he thought it would prove interesting, and, what was more to the point, instructive. In a Society amongst whose members may be found a dozen or so who were quite capable of giving a demonstration or lecture on any subject connected with photography, there were only one or two who were capable of manipulating the lantern on the many evenings when it was in requisition, and it was thought that this state of things should cease. The lecturer first showed how to use the gauge for telling the quantity of gas in the cylinder, and then connected up a blow-through jet direct with the cylinder without a regulator, and showed how the best light could be got. Next the regulator was used, the advantage of which was apparent in the control obtained over the supply of gas. The mixed jet was then shown, the increase in the light obtained being very marked. There was absolutely no danger in connexion with its use, the worst that could happen being a smart snap if the hydrogen tap was turned off first, and the rubber tubes might get blown off, the only possible danger being in the cylinder, in which the gas is under a pressure of 120 atmospheres when fully charged; but, as these are thoroughly tested before being filled, an accident is remote. The lantern was next fired up, and the mode of centering the light and getting an even disc was shown. At each stage members were invited to come up and try their hand at it, many availing themselves of the offer. The lecturer wound up by giving a few precautions that should be taken, and a few hints to facilitate working. The great thing in operating at the lantern was that everything should go smoothly and without hitch, otherwise it was very disconcerting to the lecturer, who was relying upon the operator.

**Newcastle-on-Tyne and Northern Counties Photographic Association.**—At the last meeting of this Association Mr. Baldwin, a well-known figure in the world of photographic commerce, gave a demonstration in the working of a new paper, entitled

### GRAVURA.

which the Paget Prize Plate Company are about to put upon the market. This paper, which is exposed and developed in the manner of the familiar slow bromide papers, places within the control of the operator three distinct tones of black, brown, and red. One and all were delighted with the successful results obtained by Mr. Baldwin, who confessed to working at some disadvantage, as his knowledge of the paper and the developer sent down by the firm was limited, yet secured the desired tones with ease, using as the lightning medium magnesium ribbon of various lengths at a fixed distance from the negative. The resultant pictures had much of the quality of carbon prints, being soft and delicate in tone and full of detail.

**Plymouth Photographic Society.**—January 27, Mr. J. Trouern Trend in the chair.—Mr. EDWARD G. TURNER gave a lecture,

A GLANCE AT THE CHEMISTRY OF SOME OF THE PHOTOGRAPHIC PROCESSES, which, with the aid of experiments, the members present were able to fully understand. Mr. Turney touched upon the chemistry of the various manipu-



lations in the making of a negative, from the preparation of the emulsion to the washing after fixation, and also with that of paper prints in different processes. He said that silver was the sheet anchor of the photographer, and probably the first silver that a beginner used was that of a shilling, with which he purchased his first dozen of quarter-plates, but it was hardly necessary for him to say that no chemistry was involved in that transaction. A very hearty vote of thanks was accorded the lecturer, and opinions were freely expressed as to the desirability of amateur workers acquiring a knowledge of the chemistry of photography, if only a slight one.

### FORTHCOMING EXHIBITIONS.

1899.

- February 10-25 ..... Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, 2, George-street, Edinburgh.
- „ 13-18 ..... Photographic Society of Ireland. Hon. Secretary, 35, Dawson-street, Dublin.
- „ 16-23 ..... Northampton. E. J. Felse, 53, Adams-avenue, Northampton.
- „ 21-24 ..... Hastings and St. Leonards. Exhibition Secretary, A. Brooker, 21a, Wellington-place, Hastings.
- „ 23-25 ..... Woolwich Photographic Society. Hon. Secretary, F. W. Machen, 161, Griffin-road, Plumstead, S.E.
- „ 27-March 4 Birmingham. C. J. Fowler, Court Mount, Erdington, near Birmingham.
- March 4-11 ..... South London. Hon. Secretary, A. E. Allen, 27, Princes-square, Kennington Cross, S.E.
- „ 20-May 13 ... National Trades and Industrial Exhibition, Bingley Hall, Birmingham. Manager, Walter D. Wellford, 19, Southampton-buildings, Chancery-lane, W.C.

## Correspondence.

\*.\* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\*.\* We do not undertake responsibility for the opinions expressed by our correspondents.

### PHYSICAL DEVELOPMENT OF P.O.P.

To the EDITORS.

GENTLEMEN,—As a poor provincial, who has not the opportunity of attending the meetings of the Royal and of the London and Provincial, may I be allowed to say a word or two on the subject of the debate on Physical Development of P.O.P., which has recently been engaging the attention of those august bodies.

The account, in the columns of your JOURNAL, of my series of experiments has apparently not escaped notice, although I had begun to think it had been overlooked, or else not deemed worthy of attention. I am extremely pleased and gratified to see that Mr. Sterry has taken the matter in hand, and devoted attention to further experiment on the same lines as myself. There are possibilities in several, probably many, of the methods I used, and I was led to publish the whole of them in the hope that gentlemen with more time at disposal would investigate further in the manner Mr. Sterry has done.

On the other hand, Mr. Bullen's attitude towards my experiments strikes me as savouring rather of giving a verdict before hearing the evidence. Mr. Bullen, according to your report, had not followed out my instructions, because he knew it would be useless. This is scarcely a scientific manner of investigating a new method, to say the least of it. Also, at the London and Provincial he is reported to have described me as "premature" because I had tried to cut down exposures to too short a period. As a matter of fact, I did not try to cut exposure at all, but was compelled to do so when using potassium bichromate as an accelerator to avoid general fog.

Perhaps, if Mr. Bullen will try to realise that he and I were not aiming for the same goal, he may then be inclined to grant that my method is not worthy of quite such severe condemnation as he has meted out to it. Mr. Bullen's desire is for a method of development which gives colours suitable for subsequent gold toning. For that purpose I am quite content to use the formula published by the Eastman Company with their Solio paper; it answers admirably in my hands. But when good browns are wanted without resort to gold toning, and intended to give entirely different effects to gold toning, my method of developing with pyro and very dilute potassium bichromate has, I fancy much to recommend it.—I am, yours, &c.,

W. E. A. DRINKWATER.

2, Radford-place, Plymouth, February 3, 1899.

### LIGHT-FILTERS.

To the EDITORS.

GENTLEMEN,—Some time ago I had occasion to test some methods of light-filtering, and, in course of my experiments, found that a perfectly colourless acid and bright solution of disulphate of quinine would, with a full light upon it, cut off most of the actinic rays, dependent, of course, on the strength and depth of the solution, which suggested itself as an excellent medium for the dark-room window, a glass tank containing it taking the place of the ruby glass, by which we daily damage our eyesight. Of course the containing vessels might be of yellow glass, which would add additional security without interfering with the brightness of the illumination, which would be a desideratum in any case. In my experiment I used a white glass bottle, about an inch through, and a thirty-grain solution of quinine, but other matters prevented me following up the matter, which I think it might be well worth doing.—I am, yours, &c.,

E. DUNMORE.

## Answers to Correspondents.

\*.\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\*.\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\*.\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

A. P. Reid, 81, High-street, Belfast.—Photograph of launch of "Oceanic."

F. Woodcock, sen., Douglas Head, Isle of Man.—Flashlight photograph of banquet to Mr. Hall Caine at the Villiers Hotel, Douglas, Isle of Man.

W. M. STUART.—Burrongs & Wellcome, Holborn Viaduct, E.C.

COLOURING.—Mr. T. Pilkington, whose address we believe, but are not sure, is Sackville-street, Piccadilly, W.

G. P. NORMAN.—The London Stereoscopic Company, 54, Cheapside, E.C., make a speciality of that kind of work, and would, doubtless, undertake it for you.

S. R.—Send us one or two of your failures, then we shall be better able to assist you than we can from your description; from that we can in no way account for the failures.

G. M. A.—1. For rubber stamps address Mr. E. M. Richford, 44, Snow-hill, E.C. 2. What kind of printers' blocks do you mean? Kindly state and we will give the desired information.

H. H. COBB.—1. Between Nos. 1, 3, and 4 on your list there is little or nothing to choose. All, save No. 2, may be used as single lenses. 2. We have not used it ourselves, but, from the principle adopted, we should say that it would evenly illuminate the negative. We think you could use it successfully.

CRAYONS FOR BLACK-AND-WHITE WORK.—C. B. says: "Will you tell me which is the best crayon for working up bromides in black-and-white, or if any kind will do?"—Ordinary crayons answer quite well, but they should be the same colour as the picture they are used upon, which is not always actually black.

GHOST IMAGE.—T. FIELD. The ghost, or double, image is due to a minute hole somewhere in the camera. From its position we suspect it will be found in the front, either by the flange of the lens or by the screws of the rising or cross fronts. It may, however, be somewhere in the foremost portion of the bellows. Careful examination against a strong light will reveal it.

CANARY MEDIUM.—S. A. M. asks what is canary medium and where it can be obtained, also whether it is a safe light. Canary medium is a yellow paper, and yields a very pleasant light to work by. We have obtained it from Mawson & Swan, Soho-square, and it is probably kept by most dealers. It is quite safe for ordinary plates, but is not safe for orthochromatic ones.

RESIDUES.—F. T. WRIGHT says: "Can you kindly tell me the best method of precipitating the silver in hypo bath after fixing, and should be glad if you can recommend a good book on residues?"—In reply: The silver may be precipitated as sulphide by the addition of solution of potassium sulphide, four ounces in about sixteen ounces of water. We know of no book on the subject.

BOOKS ON COLLOTYPE AND HALF-TONE.—X Y Z says: "Please favour me with name and address of what you judge to be the best text-book for colliotype and half-tone block-making? I have had no experience in either process, but am desirous of looking into them to see whether or not I should take them up as an addition to business."—In reply: *ColloTYPE*, by Schneiders, published by Bliffe & Son, 3, St. Bride-street, E.C.; *The Half-Tone Process*, by Verfassers, published by Percy Lund & Co., Bradford.



**CARBON TRANSFER PAPER.**—S. W. The reason that the gelatine solution with which you intended to coat the rough drawing paper "went clotty" is that you used too much chrome alum. This is proved by the fact, that when more heat was applied it did not regain its former fluidity. Probably with about half the quantity of the chrome alum all would have gone well.

**COMPOSITION FOR THE LUXOGRAPH.**—PERPLEXED says: "I worked a Luxograph some years ago and used to get well-exposed negatives with a very moderate exposure, about six seconds. I have recently had occasion to use the same apparatus again, but I cannot get the composition to answer, and have been greatly inconvenienced. Do you know the proper ingredients, and where I could purchase them?" Some reader may be able to supply the information asked for.

**COPPERAS.**—A. C. DENTYER. You have been trying the wrong material entirely. It is quite true that, in the wet-collodion days, some operators preferred the commercial copperas to the protosulphate of iron. But you have been trying with sulphate of copper, an entirely different thing. Copperas is sulphate of iron, and, when that name is used for it, the common commercial salt, the crystals of which are usually somewhat oxidised, is usually understood.

**FINISHING BROMIDE ENLARGEMENTS.**—MIRA says: "I cannot get crayons to take well on bromide enlargements, the surface seems to have little or no tooth. Can you tell me how to get a tooth?" With the ball of the forefinger, or, if the surface is large, with a piece of close felt, rub over with a little fine cuttle-fish powder, or fine pumice powder, so as to slightly abrade the parts to which the crayon is to be applied. Which-ever powder is used, it should be finely sifted to remove the coarse particles, so as to avoid scratches. An ink eraser will answer much the same end.

**CELLULOID VARNISH.**—COLLODION asks how celluloid varnish is prepared? He has dissolved celluloid in acetone, in which it dissolves perfectly; but, when pouring it on glass, it dries with a white matt surface, like ground glass.—We do not know how the commercial "celluloid varnish" is made, but we believe it contains no camphor, which is one of the ingredients of the usual celluloid. But celluloid, as met with commercially, is by no means a definite compound, as it varies considerably. In place of using acetone, try amyl-acetate with the sample you have; that may yield a clear film.

**CRACKED FILM.**—FIDO writes: "I have an old collodion negative, taken nearly thirty years ago, of my late father. The film is cracked all over with map-line marks, so that the prints from it look as if they were printed on a skeleton map, the lines, of course, showing black. Is there any known way of repairing the film?"—There is no way of actually repairing the film, but the cracks may be filled up so that they show scarcely, or not at all. Take some lamp black, in fine powder, and dust some over the negative, then, with the ball of the fore finger, rub it lightly over the negative. That will fill up the cracks. The superfluous black must then be dusted off.

**PLATINOTYPE PRINTING.**—W. WALTERS says: "So much has been said of late in your BRITISH JOURNAL OF PHOTOGRAPHY about platinotype that I have been prompted to send you two prints for your inspection. They were printed in the ordinary way—indiarubber pads at the back, Company's paper, cold-bath process, and I have used their paper until this occurred last year. I may say I started using their paper in either 1888 or 1889, so that I know something of the process, but never until last year did I have such a thing occur. Perhaps, through your paper, you may be able to throw some light on the subject."—In reply: The marks complained of are dark patches, which, we should imagine, were caused by silver stains or other deposits on the negative coming into contact with the sensitive iron salt. It is unreasonable to condemn a printing paper on such unsubstantial evidence as this.

**ADVICE WANTED.**—J. C. (South Wales) says: "I am anxious to get a situation in the photographic trade, and I should like if you will kindly let me know what you think of my work that I am sending you on P.O.P., Platinotype, and Velox. The photographs have all been taken and finished by myself. Can also print on Nikko and bromide paper, and make enlargements. I have not had any lessons from professional men, but have learned the business myself. If I want to know anything, I just look for it in your paper, and find what I want at once. I am young (seventeen years of age), and only an amateur. Should you think me worth 2s. or 3s. board and lodging per week? Once I get a start in the business with a good man, and as I take great delight in the work, I should soon learn."—The work sent shows promise, but it is not up to professional standard. Our correspondent would probably be worth the salary mentioned as an improver, which is the position we should recommend him to apply for.

**SOUTH-LIGHT STUDIOS.**—FOGGED LIGHT says: "Noticing your reply to a query from 'Rex' in the JOURNAL dated January 27, I really think you have made a mistake in advising the young man to undertake a studio built with south light. I don't think it worth the candle to a professional. An east or west light is quite bad enough to work, and only a professional can realize the fact. 'Rex' will, I am afraid, be much disappointed with a south-light studio."—We imagine this correspondent's experience in photography is very circumscribed, particularly as he says, "An east or west light is quite bad enough to work." How many professionals wish they had one or the other of them in place of what they have. Amongst the best portraits and studies we have some were taken in a studio with a south light. Good portraiture depends upon the skill of the photographer, not the aspect of the studio, though, as we told "Rex," a south aspect was somewhat more difficult than some others. We assume he is a photographer who understands his work.

**NEGATIVES AND THE CARRIERS ACT.**—MESSRS. WALFORD & CO., LIMITED, write: "Can you oblige us by any information as to the question of non-liability in the case of negatives or photographic plates with regard to the Carriers Act? We desire to know if there ever has been any test action upon this point. As we know you are always interested in matters appertaining to photographers, we think it just likely that you can inform us of any detail upon this point: We delivered to Messrs. Pickford certain cases. One never arrived, and it contained exposed plates (undeveloped). The carriers decline to make any compensation, on the ground that, by an Act bearing date of William IV., they are not liable for glass damaged or lost in transit. If there has been a test action, it will remain upon that decision."—We do not, for the moment, remember any test action on the point, but we have never heard that carriers are not liable for glass damaged or lost in transit if it is properly packed and addressed. We do know that carriers and railway companies make compensation in such cases when the fault is due to them. Perhaps some of our readers may tell us the law on the point.

**ENAMELLING OR BURNISHING.**—STUDIO. R. J. SCOTT says: "I should be pleased to have your opinion respecting the following: 1. Do you think there is an advantage gained by using an enameller in place of a bar burnisher for albumen prints, is there a better gloss obtained? 2. And I might here also ask your opinion respecting studio I am about to erect: Is the following about correct? Ridge roof glazed close up to ridge; length of studio inside, 30 feet; width of studio inside, 14 feet; height of studio to eaves, 8 feet 6 inches; slope of studio roof, 40 degrees; 6 feet of studio roof either end, opaque; 5 feet of studio side, either end, opaque; 2 feet 6 inches of studio from floor, opaque; all-round glass, 36 ounces, top thinner at side; matchboarding inside painted light green; curtains at side light green and white; curtains at top light green; a flat white curtain about the height of eaves. Any improvement on the above you can suggest I should feel obliged. Do you think lean-to roof preferable? I have given dimensions of studio, &c., again this week, as I thought, perhaps, I did not make it quite clear enough last week."—In reply, 1. There is not much to choose between them when both are at their best. 2. The studio, as described, will be an admirable one. The only suggestion we can make in the way of alteration is that the side be plain, instead of ground glass, unless there be an unpleasant outlook that it is desired to hide.

**STUDIO CONSTRUCTION.**—COPING writes: "I am venturing to ask your opinion on a point involved in the alteration of premises for our business. The owner of the property seems unwilling to have the heavy stone coping removed for the distance of the side light (12 feet 6 inches), and the builder intimates that it will mean a difference of not less than 2 feet between the side and the top light. Now, as the side wall is very low (only 3 feet 6 inches from floor to ceiling), should you consider that the blank space of 2 feet would prove any detriment in actual work? We are starting the side light 2 feet from the floor, with 2 feet of ground glass, and the rest ordinary plain glass. It will give us a side light of about 5 feet depth, then will come the coping space of 2 feet blank. The rooms will provide us with a studio, length of 33 feet, but we propose to partition off a small portion at one end for a printing room. This, however, will be arranged so that the camera can be taken back to the full 33 feet, when required, for groups, &c. The premises are in the principal business street here, and are in all other ways as convenient as it is reasonable to expect in such a position. We shall have a north light, with excellent waiting rooms, &c., on the first landing, and studio and dressing room above."—The coping will be a great nuisance, as it breaks the light where it is most wanted. However, "what can't be cured must be endured." We would suggest that the top light be increased a couple of feet, making it equal to the side, that will give greater scope for "coping" with the difficulty. With the alteration the dimensions of the glazing will be right.

**ENLARGED NEGATIVES.**—UZERCHE says: "I have been attempting the making of enlarged negatives for printing in carbon, but, so far, with very little success. The carbon process, given a decent negative, I find easy enough, and its results are far better than anything obtainable by direct enlarging on bromide. But the difficulty is the enlarged negative. I have tried enlarging, both with a Hume Cantilever and oil, and also with an ordinary camera and daylight; I have tried making a small transparency by contact (both carbon and on lantern plates), and enlarging that to get a negative; and I have tried making a large transparency direct, and the enlarged negative by contact. My negatives are quarter-plate snap-shots, but taken in brilliant light with the full aperture of a Goerz lens and the slowest speed of a Thornton-Pickard shutter, are not at all under-exposed. They are, however, rather hard, as they were developed with 3 grains of pyro and 2 grains of bromide of potassium to the ounce. The principal defect of the enlarged negatives has been insufficient density. I have tried strengthening the developer and prolonging the development without materially improving matters. May I ask the following questions? 1. Which is the easiest way to coat glass with a substratum for carbon transparencies, i.e., what mixture and how applied? 2. Using ordinary tissue, how much further should printing be carried for a transparency than for a direct print? I have a Wynne's print meter, and so can estimate it exactly. 3. Using an ordinary plate for the enlarged negative, which is preferable, A, B, or C? 4. Can you give me any hint as to why I fail to get density in the enlarged negatives? They are not one-third as dense as the original quarter-plates."—1. Dissolve 1 ounce of good gelatine in a pint of water, then add sufficient bichromate of potash, in solution, to give a pale yellow colour. Pour this over the plate and stand up to dry in full daylight. 2. From two to three times. 3. The ordinary brand of A. 4. Probably the transparencies are too weak. Unless the transparency is of good density, it is impossible to produce vigorous negatives. Aim at getting vigorous transparencies to begin with.



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## EX CATHEDRA.

THE Annual General Meeting of the Royal Photographic Society, on Tuesday evening last, attracted a room full of members. The proceedings passed off with their customary tameness; and there was no manifestation of discontent, on the part of professional photographers, with the Society's policy and performances. Indeed, there were not half a dozen professionals present. The ballot for the Council election, as will be seen by our report elsewhere, resulted in no very marked surprises. Messrs. Child Bayley, J. A. Sinclair, and E. J. Wall supply the new blood—if new blood it can be called—and of the old Council Messrs. R. W. Craigie and John A. Hodges were not re-elected. We regret the disappearance of both gentlemen, and trust it is only temporary. Having sat with them on the Council for the last twelve months, we had many opportunities of knowing that they rendered valuable service to the Society.

Two hundred and fifty members voted, but thirty-three of the balloting papers were invalidated for various reasons.

Mr. Sebastian Davis earned the thanks of those present by alluding to the all but universally admitted fact that the Society's exhibitions have of late not been so representative of good technical portrait and landscape work as in former year. We have had evidence of the existence of such a feeling from all parts of the country laid before us. To construe that feeling into a desire for the exhibition of "show-case work" is absurd, although if show-case work is good enough—and why should it not be?—what can be the objection to its being hung? We should be very sorry to see the show-cases of the humblest photographers disfigured by some of the dreary monstrosities that adorned the walls in Pall Mall last autumn. One or two photographers happily placed at "the top of the tree," with the accompanying delights of the frequent receipt of medals, and requests to act as Judges at Exhibitions, may be content with things as they are, and therefore can hardly be expected to sympathise with any proposed changes; but we are convinced from wide inquiry that Lord Crawford voiced a general feeling when he pointed out that only one school of portraiture was represented at the Exhibition, and that it was susceptible of being made far more catholic than it has been in the past.

WE learn from a note in a daily contemporary that that energetic photographic student of archæology, Sir Benjamin Stone, M.P., who has recently returned from Rome, received permission while in the Eternal City to photograph some of the many thousands of manuscripts and parchments which are stored away in the famous library at the Vatican. The hon. member made a selection of those relating to England, which were principally of the eleventh, twelfth, and thirteenth centuries, and is now busily engaged in the work of translating these most interesting documents. Sir Benjamin was assisted in his researches by the chief librarian at the Vatican, his two assistants, and the two gentlemen representing the British Record Office, who are permanently engaged in cataloguing these important works.

MR. F. N. BRODERICK, the well-known photographer of Ryde, Isle of Wight, recently gave a lantern entertainment in the Town Hall, Ryde, which was marked by novelty and success, and, from the description we have read of it, appears to have well earned the complimentary term of "extraordinary" that



was subsequently applied to it. He showed 130 lantern slides from his own photographs, obtained on the Ryde football field and elsewhere. The slides took Mr. Broderick four months to prepare, and apparently his hand camera followed the Ryde team through all the vicissitudes of a season of out-and-home football matches. The pictures were humorous and instructive to local admirers of the game. They included portraits, illustrations of "points" and interesting incidents, groups, and so forth. Mr. Broderick's photographs were so highly praised that we hope they may be seen on this side of the Solent ere long. The photographic illustration of a lecture on so popular a game as football is an occurrence unusual enough to deserve particular notice.

\* \* \*

COMPLAINTS are frequently made in our columns by operators and assistants who are unable to obtain the return of specimens submitted with applications for employment, and it will, no doubt, interest both sides to the undying controversy to know that by a recent jury's verdict the loss or detention of specimens renders an employer, to whom they have been sent by a would-be *employé*, liable to considerable damages. Last week, at Birmingham, an action was brought by Mr. Charles Butfield, an art printer, to recover damages from Messrs. Cond Brothers, printers, of Birmingham, for the wrongful detention of certain specimens in art printing which, it was alleged, were sent by the plaintiff on July 5 last year in reference to a situation the plaintiff was applying for. The specimens, plaintiff stated, were made up into a flat brown-paper parcel, in which was also enclosed a letter giving references, and posted on July 5 last. Defendants had admitted receiving the letter, but denied having received the specimens. The plaintiff therefore now sought to recover compensation for the loss of these specimens, which he was unable to replace, and which were of considerable value to him as proofs of his skill as an art printer. Evidence was given by a postman named Dowell, who was employed at the Birmingham G. P. O., to the effect that he delivered on July 6 a similar parcel as was described by the plaintiff to Messrs. Cond Brothers. He produced his way-bill to show that the parcel had been received by a Miss Martin, who was then in the defendants' employ. The defence set up was a denial that the parcel in question was received, it being asserted by Mr. Cond that the specimens had never reached his hands. The letter plaintiff had mentioned as containing reference was delivered in an envelope by the ordinary post on July 6, but no specimens were ever received, and, if posted, must have miscarried. The jury returned a verdict for the plaintiff, damages 75*l.*, and judgment was entered accordingly. This case is of the greatest importance to photographers and photographic assistants, and, if borne in mind by both classes, will unquestionably minimise or lessen the causes of dispute between them. The wilful detention of an operator's specimens is a cruel thing, and we are glad to see that a jury, in the analogous case above quoted, takes the view that such conduct renders an offending employer liable to damages therefor.

\* \* \*

We are indebted to a friend, Mr. C. H. Crosby, of Chicago, for a copy of the *Sunday Times-Herald* of Chicago, of January 22, in which three columns of very small type are devoted to a characteristically glowing piece of American journalese about "the wonders of colour photography," and the "possibilities of this marvellous discovery in the educa-

tion of mankind in the arts and sciences," which are declared to be "almost beyond conception." Two or three facts stand out from the mass of high falutin. (1.) The Secretary of the Chicago Society of Egyptian Research sailed for Africa recently, equipped with the means of taking colour photographs in the land of the Pharaohs. (2.) A colour-photography academy is being built in Chicago for the use of professors and students. (3.) The process that is to achieve such mighty wonders in Egypt, Chicago, and other parts of the world, through the agency of a Mr. D. K. Tripp, is that known as McDonough's, and McDonough was anticipated in his discoveries by Ives and Joly. Three-colour lantern slides are now fairly common objects of the lecture-room on this side of the Atlantic, and colour half-tones are, of course, familiar to everybody by now. The Chicago people are very belated in their ideas about colour photography. What they are attempting to boom is not new, and we really doubt whether three-colour lantern slides of Egyptian subjects will be as effective and satisfactory as the series of the Photochrom Company's mechanically prepared Egyptian prints, which are obtainable at a few shillings each. Unless we are greatly mistaken, we can perceive the hand of the company-promoter in the Chicago outbreak of colour-photography academies, and all the rest of it.

\* \* \*

AMONGST new publications that have reached us reference is deserved by *The Poster Collector's Circular*, published by Messrs. P. G. Huardel & Co., 18, Cranbourne-street, Leicester-square, price 3*d.* monthly. The circular contains many reproductions of native and foreign posters, and the letterpress notes are bound to be interesting to the votaries of a very attractive cult. Dudley Hardy's theatrical posters are purchasable at prices ranging from 1*s.* to 5*s.* 6*d.* *The Universal Provider and Shopping News* has its scope indicated by its subtitle, "A Journal for Buyers and Dealers." It is published weekly at 68, Farringdon-avenue, E.C. One of its early numbers contained an article on the defects of the British patent system, which it criticises very unfavourably. Where, it asks, is the protection to the poor inventor? The system is a device and a snare, and practically perpetuates a department to receive fees only, while the patentee must depend upon his own exertions and the length of his purse to successfully cope with those who designedly seek to wrest from him any benefits he may hope to derive from his invention. It is, in a word, discreditable to our nation, and the sooner a more honest system is established the better it will be from a moral standpoint, and become, as it ought to become, a real practical help to the rising generation of inventors. We have expressed exactly similar sentiments over and over again, and are glad to find them shared by our young contemporary.

\* \* \*

The prospectus has been issued of the British Mutoscope and Biograph Company, with a capital of 300,000*l.*, formed to acquire the business of the Mutoscope and Biograph Syndicate, who for eighteen months past have done much to popularise animated photography at places of entertainment, &c. The list of applications closed on Wednesday last. Interest in animated photography seems to us to be by no means on the wane. Writing on the subject at the conclusion of our article in the ALMANAC for 1898, we remarked that it appeared to us that this branch of photography was destined to have something



more than a transient existence, and what has happened since we then wrote (in October, 1897) fully bears out our opinion of the stability of the hold of animated photography in public favour.

\* \* \*

We have received from Mr. William Tylar, of Birmingham, a list and sample of his series of penny stereoscopic (paper) slides. The latter is a view of Zermatt, and is excellent value for the money, regarded either photographically or stereoscopically. Mr. Tylar claims to hold the largest variety of stereoscopic slides in the Midland Counties, his views of the British Isles alone amounting to 4000. He has a series of stereoscopic subjects taken by Royal command. Mr. Tylar finds that interest in stereoscopic work is on the increase—a fact that we are pleased to learn. The wide distribution of cheap and good stereoscopic slides should help to promote the growth of this class of work among professional photographers, for it is probable that, by contemplating properly prepared binocular slides in the stereoscope, the public may be the more easily induced to patronise stereoscopic portraiture, a branch of photography the resuscitation of which we have often pleaded for.

#### RADIATION OR CHEMICAL ACTION AS A FOG-PRODUCER.

THE interesting experiments by Dr. Joachim Sperber, described in our issue for February 3, taken in conjunction with those of Dr. Russell, on the actinic radiation from supposedly chemically inert bodies and its action upon dry plates, raise many important questions, and it is not a little singular that they remain virtually the only definite experimental records of such action that must be capable on occasion of seriously influencing photographic results. It may perhaps be considered that Dr. Sperber's two experiments are not sufficient for us to accept as facts, first, that turpentine vapour has no chemical action upon dry plates *qua* vapour; and, secondly, that it can, however, so act upon that part of the universal ether in its own vicinity as to cause it to so vibrate that it will act similarly to light upon the sensitive silver film. The point that would first strike the investigator when examining the results of Dr. Sperber's two experiments is the conclusion that turpentine vapour, acting for a period of four or five days upon some of the dry plates, should be without result, especially when the chemical properties of the liquid in question are considered. Turpentine is well known to absorb oxygen from the atmosphere, a process of slow combustion, in fact, taking place with the production of a certain amount of ozone; *a priori*, some slight amount of reduction of the silver haloids might naturally be expected to result and to show upon the application of the developer. Possibly other experimenters may take up the matter, and we await with interest further results, either from them or from Dr. Sperber himself, as promised.

The present seems a suitable occasion to refer to another phase of the subject, the more so that some recent experiences have a very practical lesson to inculcate. We had occasion to test a new hand camera, and in the course of a day we exposed its whole contents, a dozen plates, in the usual sheaths. Development was not undertaken for several days; but, when the plates were developed, all were hopelessly fogged. This was so unexpected, so unaccountable, that it seemed little less than mysterious. There was certainly no light leakage in the camera; the plates were put in their sheaths in a safe light

and developed similarly in each case, indeed under circumstances in every way identical with those under which hundreds of other plates had been safely operated upon before, and have been since. The conclusion we came to was, that the camera, new from the maker's hands, and smelling strongly of the varnish used to blacken it, was defective because of the vapour from that varnish. We took out the sheaths and placed them before a fire, leaving the camera open, for the varnish solvents to become thoroughly evaporated. When all was put together again after a few days' exposure, and once more tried, everything went well and not a trace of fog was noticeable. This experience might be put down as a pure coincidence except for a remarkable confirmation of our views. A well-known professional photographer had occasion to develop for a lady amateur a dozen plates (put in their places by that gentleman), and exposed in an identically similar camera, also brand new. To his surprise all the plates were fogged, and it was not till we compared notes that the conclusion was inevitable to him that the fog was caused by exposure to the vapour from the half-dry varnish. It could not be ascribed to Dr. Sperber's ether vibrations, for the fog was equal all over the plates, and, about as near as the eye could judge, equal in intensity on each plate, though various lengths of time must have elapsed for each individual plate to be exposed to direct radiations.

We have another somewhat similar effect to describe. Quite recently a photographer of our acquaintance had a day's work with eighteen  $12 \times 10$  plates. Six of these had been in the slides for over a month, and, of these six, five were exposed and one unexposed. When the five, together with another plate of the same subject (only placed in the slide the same day), were developed, the latter was perfect, but the five were ruined by a band of fog extending for a width of two or three inches across the whole of one end of each plate. There seemed no possible explanation, for the first thought, that the slides might leak light at the hinges, proved to be untenable. Then the possibility of some emanation from the light-proof cloth used for hinging the pieces of the flexible back together, being the *fons et origo mali*, occurred to our friend's mind. Luckily, there was an unexposed plate remaining in one slide, and it had been there for the same length of time as the five. It was placed, unexposed as it was, in developer, and in a few minutes' time there appeared a broad band of reduction just opposite to where the cloth of the hinged back was cemented. Now, we are not able to state either the constituents of the varnish used on the hand cameras, nor yet that used for the light-proof cloth, nor of the cement by which it was attached; but this we do feel certain about, that, in each of the cases we describe, some agent was at work that produced fog. Whether it were ethereal vibrations, as suggested by Dr. Sperber in his experiments, or whether it were simply a case of chemical reduction by a deoxidising agent in the varnish vapour, cannot be considered demonstrable to a certainty. But that certain samples of black varnish can give off emanations resulting in fog to plates exposed long enough to their influence is incontestable, and is a fact to be remembered by practical workers.

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**Occult Causes of Plate-fogging.**—The interesting paper on the cause of plates fogging when exposed to turpentine radiations or emanations which appeared in a recent issue—the subject being one to which we have referred above—brings into recollection many isolated experiments which have been related from time to time in these columns: the flash of light when withdrawing a plate from



the developing solution, the possible radiation from the paper strips separating the plates in their packages, and so on. That luminosity from simple means may be brought about has long been known, the old experiment of striking two lumps of sugar together in the dark is an example. The luminosity of sugar was the subject of a paper at the last meeting of the British Association. The same subject is referred to by Mr. Thomas Steel, of the Colonial Sugar Refinery Company at Sydney, and, from the examples he gives, it may be readily imagined that other equally simple means of bringing about luminosity, and, in consequence, fog, may occur in the handling or storage of dry plates. Mr. Steel points out that sugar as delivered from a hopper in its manufacture is always luminous in the dark. A heap of loose sugar struck with a shovel, a small bag of sugar set hard in dry weather scraped with a spoon, and so on, will in each case produce luminosity.

**A New Projection Microscope Lens.**—In the *Journal of Applied Microscopy* is an account of an objective of 20 mm. focal length and 0.95 numerical aperture. It is stated to be a copy of a 5 mm. apochromatic, the diameters and radii of the latter being increased four-fold. Dr. White's theory is that with a magnifying power of a thousand, if a certain aperture is needed for proper definition, a similar aperture will be needed for projecting an image on the screen, even if it be obtained with a three-quarter inch objective and a projection eyepiece.

**A Method of Rectifying Prismatic Spectra.**—We read in *Nature* that in Professor M. B. Snyder's pamphlet upon the Harvard Astrophysical Conference there is an account of the ingenious method of Mr. E. S. King of converting prismatic spectra into normal spectra. To do this, the original plate is inclined to the plate on which the copy is to be made by an amount calculated to make the scale exact for three points in its length, while at the same time maintaining good focus. As illustrations, he showed several stellar spectra compared with Rowland's map of the solar spectrum. Professor Pickering said that the method was perfectly general, and all scales were thus reproducible. This description is rather vague, but it apparently refers to copying in the camera, or other analogous means, the negative to be copied, and, in consequence, the spectrum, being thus shortened, as it were, by reason of the tilting of either the plate by the swing back or the negative itself.

**Physiological Opacities to Röntgen Rays.**—At the Royal Dublin Society's last meeting a preliminary note was forwarded by Mr. A. W. Henley upon a method of measuring the relative opacities of various organic substances to the X rays. Some of the substances experimented with were bone, muscle, and fat, and the relative opacities of these bodies were, respectively, 4, 2.5, and 1. The method of procedure was to prepare wedge-shaped pieces of the various structures, place them side by side, and, after finding a point in each wedge equal in colour, measure the thickness of the wedges at the respective points. This method presupposes a degree of uniformity in the Röntgen radiations, which all practical workers know does not exist. Quite recently we saw a large collection of skiagraphs of the human limbs and thorax, in the majority of which there was scarcely any difference in the opacity of bone and flesh. An important point in Röntgen-ray work is to have control over the penetration of the rays.

**Competitions.**—During the past few years photographic competitions seem to have been the order of the day amongst illustrated papers, sensational advertisers, manufacturers, and some of our photographic contemporaries. The subjects offered in competitions have been varied, though not greatly; but we imagine that those inaugurating these competitions, after a few years, are

somewhat at a loss for a subject. *Spring, Summer, Autumn, Winter, Solitude, Rest, Sunset, &c.*, have been done *ad nauseam*. There is one subject we would suggest for competition to those at a loss for subjects that we do not remember being offered before, namely, examples of technical photography. Of late years that seems to have been entirely overlooked at exhibitions and also in competitions.

**London and New York Weather.**—Some weeks back we gave some hints for the avoidance of winter troubles in photography, also as to how photography in winter might be turned to a profitable account by professionals. So far they have been of no value, though this time four years ago we were involved in an arctic winter. Friday last was a record day for heat in February, for the thermometer at the Meteorological Office registered 68°, the highest it has reached for more than fifty years. Curiously enough, the day in New York was also a record one; but in the opposite direction. There the temperature, officially stated, was six degrees below zero; and it is stated that, in more exposed situations, it touched some six or eight degrees below that. According to authentic records, it is said that only three times has it been as cold as that in February, but never colder. Such, however, were the opposite conditions of the weather, on Friday, on the two sides of the "herring pond." Possibly London photographers have not envied their American *confrères* so very much, after all.

**Gift to the London County Council.**—At its meeting last week the London Council decided to accept the gift of Mr. S. Prout Newcombe of his natural history collection and library. The collection consists of over twenty thousand objects and a considerable mass of literature on the subject. It may interest some of our readers to know that Mr. S. Prout Newcombe was a photographer. Indeed, he may be said, in conjunction with Mr. C. W. Quin, trading as the London School of Photography, to be the pioneer of cheap photography on paper, doing portraits on paper the quarter-plate size at half a crown, 5×4 three and sixpence, and the half-plate at five shillings—duplicates half these prices. During the late fifties and early sixties, Mr. Newcombe had several places in London and the provinces—Sheffield, Manchester, and Liverpool. In his price-lists it was stated that the negatives were kept for a month—or may have been three months—during which time they might be purchased by the sitters at the same price as duplicates. At that early period it will be seen it was an established and recognised fact that the negative was the property of the photographer, and could only be had by the sitter by purchase. We do not remember that this early "custom of trade" has been quoted in the Law Courts when this once-vexed question was contested.

**The Paris Exhibition of 1900.**—The position of the British Commission on this Exhibition has been considerably improved by a Treasury grant increased from 75,000*l.* to 130,000*l.* But it is said that the work of arranging for the British representation can only proceed slowly by reason of the dilatory action of the responsible French authorities. With this increased grant it is to be hoped that photography will be better represented than it would have been with only the smaller sum, and that greater facilities will accrue to the exhibitors in the matter of transmission of exhibits, &c. This Exhibition is to be a big thing—the biggest thing yet, and it is hoped that it will be carried out as projected, and completed fairly within its closing time; but, if the rumours are correct about the dilatoriness of the executive, that at present seems doubtful. The Chicago show a few years ago was a big thing, but it was scarcely completed at its close. An astute Yankee said of that before it was opened, "We mean to make a big thing of it, but I guess we have cut about as big a slice as we can eat." We hope our French neighbours have not cut a bigger slice than they will be able to get through, at least fairly within the opening time.



## JOTTINGS.

EXIT Bennetto: exit Sellé; *exeunt omnes!* To my personal knowledge the Sellé process of colour photography has been hawked round among the company-promoters for the last two or three years, only to be dropped or passed on. Glancing down the reported bankruptcy proceedings in the newspapers last week, I saw that the gentleman who was the very last to take up the ominously named Sellé method figured as the object of a public examination before a Registrar. Now, I am wondering where the Sellé process will bob up next. I first met it—but stay, I think I'll keep my colour photography reminiscences for my autobiography. They are much too funny for these austere columns.

Mr. James Burns, who lately read a paper on "Pictorial Photography: its Difficulties and Pleasures," before the Edinburgh Photographic Society and which is printed in the JOURNAL for January 27 last, will find accuracy of statement an acquisition in the preparation of any further literary efforts that he may design to read to Edinburgh photographers. His name is quite new to me, and I shall not mourn if I never see it again while its owner is at such little pains to verify his references, as the following extract from his paper shows him to be: "A writer in one of the oldest photographic journals seems to find the whole sweetness of his life in abusing the pictorial school; and his great ambition is to write the epitaph of that school, or don the mantle of Gibbon and astonish the world with a new Decline and Fall." It is on record that I look forward to one day writing the epitaph of the institution known as the Photographic Salon; but this is a very different thing to "abusing the pictorial school" and writing its epitaph. Mr. Burns evidently doesn't know what he is talking about; but that is no excuse for utterly erroneous statements when the means are at hand for avoiding them, in the file of THE BRITISH JOURNAL OF PHOTOGRAPHY which I believe his Society possesses.

"Rex" and "Fogged Light" in the Answers to Correspondents columns of the last two issues, have raised the question of south-light versus north-light studios. I may refer both gentlemen to a paper, entitled "Is the Present Construction of Photographic Studios Wrong in Principle?" by the late W. H. Harrison, printed in this JOURNAL for May 19, 1893. In the course of that paper Mr. Harrison raises an objection to north-light studios on the ground of the floating particles in the air interposing a reflecting screen between sky and studio. He suggested, indeed, the reflection of the light from a whitewashed wall, the studio having a southern aspect, glazed high up. The rays falling on the wall would give the chief light for the illumination of the sitter. There are several more interesting points in the paper, which is well worth perusing by others as well as the two correspondents who have reminded me of the matter.

The recently published letters on the subject of the Royal Photographic Society and professional photographers included one from Mr. F. M. Sutcliffe, who, in his reference to the value of the Society's Fellowships (p. 62), says that, when the higher dignity was created, the Society was not particular what the Fellow knew of photography so long as he had two guineas in his pocket. This is not, perhaps, the fairest way of stating the case. When the Fellowship scheme came into force, existing members were naturally given the privilege of opting for the higher grade; but, since then, admission to Fellowship has only been by election on evidence of qualification. To-day, at any rate, Mr. Sutcliffe may take it from me that a man does not so easily acquire a Fellowship as he seems to suppose. A fairly severe ordeal has to be passed first.

I grant that the Fellowship has here and there gone into hands from which it might have been withheld; but the mistake is not likely to be repeated. From the list of 250 Fellows lately published perhaps a dozen or so names could well be eliminated; but it is a very good and weighty list on the whole, and it includes such professionals as Harvey Barton, R. Beckett, F. T. Beeson, H. W.

Bennett, Thomas Birtles, S. B. Bolas, F. N. Broderick, Warwick Brookes, John Bulbeck, J. C. Burrow, W. J. Byrne, T. H. Chaffin, J. H. Coath, Henry Cooper, C. E. Corke, John Davis, G. T. Y. Dickinson, T. J. Dixon, T. Fall, J. H. Gear, William Gill, F. M. Good, W. E. Gray, William Grove, F. Hollyer, C. B. Keene, E. D. Lavender, H. Bedford Lemère, F. and T. Marsh, G. W. Morgan, A. F. Mowll, S. Glen Payne, G. Pendry, Douglas Pym, E. Scamell, J. B. Scott, F. Thurston, W. M. Warneuke, G. Watmough Webster, Alfred Werner, and H. R. Yeo—not by any means a bad or unrepresentative list, in which the honoured name of Frank Sutcliffe might very well find a place. What sayest thou, O' Sage of Whitby?

A gaslight developing paper is such an obvious modification of the gelatino-bromide printing process that now we have it with us from five different sources, one is all the more surprised that it was not thought of years ago. Putting out of sight the very prolonged exposures needed to secure coloured deposits by development, it is remarkable to note the wide range of sensitiveness between the papers when used to secure black images. Light, negative, distance of flame from frame being the same in both cases, 20 seconds at one end of the scale, 200 seconds at the other, that is, a ratio 1:10, represent the rapidities of the fastest and slowest of these papers with which I have at present worked. From the standpoint of the casual worker, who only needs now and then to produce a few prints, the slower papers, with their greater freedom from liability to fog, must possess the balance of advantage, while to a professional man, with whom time is an object, the quicker papers must necessarily appeal. I am surprised that the noisy advocates of "personal control" in print-making have not perceived that these gaslight papers, which are amenable to brush development, supply what they have long been clamouring for, especially as regards colour of deposit, which is entirely under command. And, as with bichromated gum, you may make it as difficult as you please to get two prints alike by gaslight development, it is the ideal Salon process. Mr. Craigie, now's your chance!

The Yorkshire Union of Photographic Societies has very early commenced to taste the bitterness of dissent, for the withdrawal of such a powerful and ably officered organization as the Leeds Camera Club (whose well-reported proceedings have for a long time past supplied readers of this JOURNAL with some really valuable information) is a serious blow to the scheme before it is well on its legs. However, the defection of Mr. Warren's merry men (the precise reasons for whose abstention from the Union can, of course, only be properly perceived by those on the spot) should spur the Bradford men on to renewed exertions in establishing the Union. But I must confess that, the more distinctly that scheme takes shape, the plainer and more formidable do the difficulties of administration become. If the Union can successfully run and manage both a voluntary and paid lecturing staff at once, it will take credit for a great achievement. Still, they do big things in Yorkshire, and I wish the Union success.

It appears that the Leeds Camera Club has not only held aloof from the Union, but has resigned from the Affiliation of photographic societies. This is quite one of life's little ironies! Last year and the year before the Affiliation was "all Yorkshire," as I heard it recently put by a prominent London photographer; to-day Yorkshire and the Affiliation are not on speaking terms. Here there is obviously scope for the pencil of a clever cartoonist or a comic versifier! Mr. Warren himself might try what he could do in the matter. Such an epidemic of retirements, resignations, and shan't-play-any-more-ism at any rate supplies the photographic world with a little much-needed amusement, and therefore does some good. Joking altogether apart, however, I am sorry the L. C. C. has dropped out of the Affiliation. The latter is now happily in the firm hands of Colonel Waterhouse—an experienced, tactful, and conciliatory administrator, who may be depended upon to direct the scheme to the best advantage of the contributory societies and the R. P. S. and who,



he had been at the head of the movement all along, would not, I am sure, have allowed so much friction to occur as has unfortunately been the case in the past.

A rumour reaches me that at the forthcoming meeting of the Convention at Gloucester in July the pictorial exhibition, which has hitherto been a welcome feature of these pleasant and useful gatherings, is in danger of being abandoned. May I suggest that, if the President-elect, Mr. William Crooke, could see his way to organize a representative exhibition of pictorial portraiture, a division of photography of which he is the admitted head, it would be very highly appreciated, not only by Conventioners but by the people of Gloucester and neighbourhood. There would be some trouble and labour in organizing and hanging the exhibition, no doubt, but Mr. Crooke should surely find many willing helpers in the work. At any rate it seems a pity to abandon the exhibition idea, and at the same time to decrease the number of the business meetings, as is proposed to be done next July.

COSMOS.

## ON THE USE OF TELE-PHOTO LENSES IN ASTRONOMICAL PHOTOGRAPHY.

[Translated from the *Photographische Correspondenz*.]

In the November issue of this periodical the attention of a large circle of readers is directed to the use of the tele-photo lens for the study of the heavens, but without any explanation of its applicability to the purpose. As I am rather intimately associated with the construction of the tele-photo lens, and as the works bearing my name introduced it as an optical instrument for astronomical purposes, and have manufactured it for many years as the photographic telescope, I think it important that erroneous opinions should not be created concerning the use of these telescopes. Hence these remarks.

To form an idea of the work it may accomplish, we will first consider what objects in the heavens are open to photography. They may be classified in two primary divisions: those depicted as points, and those as surfaces. To the former belong all the fixed stars excepting the sun, and to the latter all the planets with their satellites, the comets, nebulae, double stars, &c.

For those images rendered as points, the aperture of the objective with which they are photographed need only be considered, since the objective with the largest aperture will define the smallest stars in the absence of other disturbing causes. If we remember that the stars send out light in all directions, and that the portion of the light which reaches us may be conceived as a beam of parallel rays, then, popularly speaking, all the parallel rays falling upon the objective will be united and form a point. The larger the aperture of the objective, the brighter will be the point, because it is formed by a larger number of rays of light. The distance of the point of convergence from the objective is of no importance. Consequently, the brightness of the image does not depend upon the focus, but upon the aperture of the objective. The facts are somewhat modified by the circumstance that lenses do not form mathematically perfect points of light, and the theory of diffraction also teaches us that an increase of light does not under all conditions add to the brilliancy of the image. But we will pass over these factors, as we are not concerned with the rendering of images as points, for it would be absurd to artificially lengthen the focus of an objective for photographing objects, when their representation is not influenced by length of focus. Tele-photo lenses are objectives of this description, as we shall subsequently see.

When we come to the representation of objects with dimensions, the focus, as well as the aperture, of the objective plays an important part, because it determines the size of the image. With an objective of given aperture, only a definite quantity of light is available for the formation of the image, and it is evident that, of a number of objectives with the same aperture, that with the shortest focus will give the brightest image. We must therefore distinguish between heavenly bodies of low and high luminosity in considering those of magnitude. The former should be photographed with objectives of short focal length in proportion to aperture, and principally comprise the nebulae, comets under certain conditions, and many double stars, but we will also leave these bodies out of consideration, because they emit too little light to be of any use for photographing with tele-photo lenses.

The luminous heavenly bodies of magnitude are those which particularly interest us, namely, the sun, moon, and planets. As we have seen,

the size of the image depends upon length of focus, and larger images can only be secured by using very long foci. With ordinary objectives, focussed for infinity, the distance of the image from objective is about equal to the focus, and a camera is therefore used equal in length to the focus. But this necessitates very expensive and unwieldy instruments when rather long foci are used. If, however, a negative lens is placed in the cone of rays formed by such an objective, its focus will be considerably lengthened beyond the distance between image and objective, and in this manner a tele-photo objective is formed with a tube much shorter than the focus; but to this external advantage there is a corresponding internal disadvantage, namely, the diminished intensity of image. In using tele-photo lenses it is therefore necessary to confine oneself to the heavenly bodies forming images of magnitude, or, as we shall subsequently see, to one only. An immediate consequence of the low intensity of tele-photo lenses is the necessity for long exposure, in which case atmospheric disturbance has much influence, as it is magnified in like manner, and the image becomes very poor; but much may be done by exposure and development to counteract this.

We will leave these difficulties and consider what limits are imposed upon the use of the tele-photo lens by the laws of nature. For this purpose we will take practical examples by setting ourselves the task of photographing the following bodies:—

- I. Double stars.
- II. Planets.
- III. The moon.
- IV. The sun.

### I.—DOUBLE STARS.

In photographing double stars we, of course, desire to obtain them distinct from each other.

In the following table the distance of image at various foci is given for certain well-known double stars. It will be seen that it is only possible to separate close double stars by means of large tele-photo objectives. The stars are always represented of a certain diameter upon the plate, and we will take this as 1 mm. With a tele-photo objective of 50 m. equivalent focus, or about 5 m. length,  $\zeta$  Bootis with 0.8" separation would be well defined. Under similar conditions a tele-photo objective of 5 m. focus would only separate stars of 5" angular distance or more.

I have placed the limit of separation rather low, or, rather, the diameter of the image of the stars somewhat high, because the image obtained with a tele-photo objective of 5 m. focus can never be as good as that obtained with a single objective of the same focus but larger aperture. I have repeatedly seen pictures of double stars, distinct from each other, although only 8" apart, and these were taken with an objective of 33 cm. aperture and 4.8 m. focus made at our works, but very short exposures were given. The exposure would be very considerably longer with a tele-photo objective, and the image consequently larger. We may therefore conclude from these considerations that tele-photo objectives are of little use for photographing double stars unless the apparatus is of very large dimensions.

TABLE I.

Stars.	Separation.	Distance between the centres of both stars, in millimetres, at the foci of the tele-photo objective.				
		5 m.	15 m.	30 m.	50 m.	
	sec.	mm.	mm.	mm.	mm.	
$\zeta$ Ursa Major (Mizar).....	14.3	0.35	1.04	2.1	3.5	
$\gamma$ Andromeda .....	10.3	0.25	0.75	1.5	2.5	
$\pi$ Bootis .....	6.0	0.15	0.44	0.87	1.5	
$\gamma$ Virginis .....	5.0	0.12	0.36	0.73	1.2	
$\alpha$ Corone .....	4.0	0.10	0.29	0.58	1.0	
$\zeta$ Ursa Major .....	2.0	0.05	0.15	0.29	0.48	
$\zeta$ Bootis .....	0.8	0.02	0.06	0.12	0.19	

### II.—PLANETS.

Those who wish to photograph the planets will chiefly desire to secure surface detail, in order to deduce the time of revolution or for the purpose of studying the details themselves. From the following table we may see how large the various planets are rendered by tele-photo objectives at certain foci. In the first column the apparent diameter of the planet is given when nearest the earth; in columns 2 to 5, the diameter of the image corresponding to apparent diameter of the planet. In columns 6 and 7, the aerial image, and the enlarged apparent aerial image through an ocular, as rendered by a telescope of 2100 mm. focus and 400 times magnification.



This table shows that only the larger tele-photo objectives render the planets of sufficient diameter to permit of detail being seen. A telescope of 2100 mm. focus cannot be considered large for observing the planets; but they are seen seven times larger than they can be photographed by a tele-photo lens of 15 m. focus, which would be of about the same outward dimensions. The photograph would have to be enlarged seven times to show the same detail that the eye would see through the telescope. Those who know how much a photograph loses in sharpness and clearness, even when enlarged to a small extent, will be able to understand that planet photographs will not bear so much enlargement when taken with a tele-photo objective, and that it is impossible to use the tele-photo objective for the surfaces of the planets to supersede drawing by means of the telescope. If photographs of the planets are wanted of the same size as these bodies are seen through telescopes of moderate dimensions, the tele-photo apparatus must be so large that it would be difficult to use.

TABLE II.

Planets.	Dia- meter.	Diameter of image at foci.				Telescope of 21 m. focus and 400 times magni- fication.	
		5 m.	15 m.	30 m.	50 m.	True aerial image.	Apparent aerial image.
	Sec.	mm.	mm.	mm.	mm.	mm.	mm.
Mercury ...	13	0.32	0.95	1.89	3.15	0.13	6.4
Venus .....	65	1.58	4.73	9.45	15.76	0.66	32.2
Mars .....	26	0.63	1.89	2.78	6.30	0.265	12.9
Jupiter ....	51	1.24	3.71	7.42	12.36	0.519	25.3
Saturn .....	21	0.51	1.53	3.05	5.08	0.214	10.4
Uranus .....	4.7	0.11	0.34	0.68	1.14	0.048	2.3
Neptune ...	2.7	0.07	0.21	0.39	0.65	0.028	1.3
	1	2	3	4	5	6	7

To photograph Saturn, for example, in the same manner as Herr Leo Brenner has drawn it in vol. 145 of the *Astronomische Nachrichten*, the focus would have to be 450 m. Even if so strong a negative lens were employed that the entire length of the photographic telescope did not exceed one-twentieth of the focus, it would still be necessary to use a tube 22.5 m. in length.

### III.—THE MOON.

The moon is, doubtless, a more favourable object than the planets for the tele-photo objective. Even if the proportions of the direct photograph were the same as the image seen through a telescope, this would not be objectionable, because the details of the moon are so large and distinct that they may be seen with a very small telescope; but the image is so weak when formed by a tele-photo objective with large magnification that long exposures are necessary. Under such circumstances, the movement of the moon in declination is frequently a disadvantage. This cannot be corrected by the clock attached to the instrument, and it is sometimes so great that photography becomes impossible. If the movement in declination, for example, amounts to 2° 50' in twelve hours, then during an exposure of eight seconds, with a tele-photo objective of 32.3 m. equivalent focus, a point would traverse 29 mm. upon the plate, which means that the entire image would be void of detail. But an exposure of eight seconds would be, in my opinion, decidedly too short. It is, however, possible to avoid this difficulty by taking photographs when the movement of the moon in declination is small, which may be ascertained from the *Berliner Jahrbuch*; but this curtails the use of the instrument considerably. It is best, in photographing the moon, not to use a very long focus, and to enlarge the negative as much as possible for use as a guide in making drawings by means of the telescope. It is, therefore, evident that photographs of the moon taken with the tele-photo objective cannot be used as substitutes for drawings, but they are of supplementary use, and in this way the tele-photo objective may be of value for studying the moon.

### IV.—THE SUN.

The heavenly body most suited to photography with the tele-photo objective is decidedly the sun. It is so luminous that instantaneous exposures may be made even with the slowest of objectives. The advantage of the tele-photo objective, very long focus in comparison

with aperture, may therefore be utilised to the fullest. At the same time sufficient detail is rendered even by tele-photo objectives of small dimensions, as spots and flames often cover enormous areas of the sun's surface. Sun spots have been observed of 300' diameter, or five times larger than Venus in her most favourable position. With a tele-photo objective of 5 m. focus these spots would measure 7 mm.

To recapitulate briefly, the tele-photo objective is only of real use for photographing the moon and sun. For the moon, with the limitation that the advantage of the instrument, long focus in relation to aperture, should not be overstepped; in other words, photographs of the moon, made with a short instrument, should not be too large. Those who undertake observations of these bodies within the limits I have mentioned will find the tele-photo objective very useful, but those who expect pictures such as they are accustomed to see through the telescope will find themselves deceived.

DR. RUD. STEINHEIL.

### A NEW PLATINUM TONING BATH.

PROFESSOR VALENTA has been experimenting with some of the aromatic compounds for toning, and has found that several of the amines are useful. The best proved to be m-phenylenediamine, which has the formula  $C_6H_4 \begin{matrix} \text{NH}_2 (1) \\ \text{NH}_2 (3) \end{matrix}$ , and is formed by the reduction of m-dinitrobenzene with tin and hydrochloric acid.

The hydrochlorate forms small white crystals, which dissolve rapidly in water and give an acid solution.

The salt very quickly reduces solutions of chloride of gold, and cannot therefore be used for the preparation of gold toning baths; but with platinum salts the reduction only takes place after a long time, and then only slightly. The mixture of solutions of m-phenylenediamine and chloro-platinite of potash gives a clear yellow solution which can be used for matt silver paper, and tones quickly and gives excellent results.

The following bath was used:—

Water .....	100 parts.
Chloro-platinite solution (1 : 100) .....	5 to 10 parts.
M-phenylenediamine solution (1 : 100) ...	5 to 10 "

The prints should be washed for a short time in soft water, and then placed in the above bath, in which they assume an intense platinum tone. They should be fixed with ten per cent. hypo, and well washed in running water. The tone of the prints is an intense black with pure whites.

If blue-black tones are wanted, the prints should be first toned for a very short time in

Water.....	1000 parts.
Borax.....	10 "
Sodium acetate (fused) .....	10 "
Chloride of gold .....	5 part.

After this they must be thoroughly well washed, or the gold will be precipitated all over the print.

### FOREIGN NEWS AND NOTES.

**Ammonium Persulphate.**—Dr. E. Vogel writes in the *Photographische Mitteilungen*, recommending this reducer for collodion emulsion negatives. It frequently happens, in copying subjects with much contrast, that the results show the defect of hardness. This is very noticeable in photographing oil paintings with a colour-sensitive emulsion, and, notwithstanding the most careful development, the high lights become over-dense before detail in the shadows is secured. Longer exposure will assist the latter, but the high lights will then suffer from the opposite defect, solarisation. The collodion film is inferior to the gelatine dry plate in this respect, but it has other advantages, such as cheapness and the facility for preparation of plates differing from the ordinary standard sizes. If the ammonium persulphate reducer is used, the negatives may be developed until the shadow detail acquires sufficient strength, quite regardless of the over-density of the high lights. After the plates have been fixed and carefully washed, the reducer should be applied until the contrast is sufficiently lowered to produce an harmonious print. A two per cent. solution is recommended and it is preferable to reduce the negative before allowing it to dry. The negative may be reduced to the full extent desired, as the persulphate is more rapidly removed from the collodion film by washing than is the case with gelatine.



**Over-exposure in Carbon Printing.**—According to Professor Namias an over-exposed carbon print may be rendered amenable to development by previous immersion in a bath consisting of 100 parts of water, 1 part of strongest sulphuric acid, and 5 parts of ammonium persulphate. The print should be immersed, according to circumstances, up to half an hour. The  $\text{Cr}_2\text{O}_3$ , which renders the gelatine insoluble, is converted to chromic acid, and the gelatine is restored to its soluble condition. The picture may then be developed with warm water.

**Decomposition of Fixing Baths.**—The *Photographisches Wochenblatt* draws attention to Dr. P. Michaelis' experiments, an account of which appeared in the *Rundschau* a short time ago. A solution of hyposulphite of soda was prepared of the strength of 1 gramme to 10 c.c. of water. This was exposed to the air in trays,  $13 \times 18$  c., each containing 250 c.c. of the solution. At certain intervals, 10 c.c. of solution were taken from each tray and titrated with a solution of iodine, to determine the quantity of hyposulphite present. Before titration the solution in each tray was poured into a measure, and the water which had evaporated replaced. It was found that the solution deteriorated constantly, but in diminishing degree, as may be seen from the following table:—

Number of days' exposure.	Diminution per cent.	Number of days' exposure.	Diminution per cent.
1	0.74	5	5.2
2	1.98	9	6.2
3	3.72	13	7.44
4	4.46	21	9.92

The loss of hyposulphite would appear to be unimportant, but the deposition of sulphur might seriously affect the image. We may therefore gather from these experiments that it is desirable not to unduly prolong the process of fixation.

**Retouching Pencil.**—The *Photographisches Wochenblatt* also mentions that F. Götz, of Helsingfors, has patented a retouching pencil, the lead of which is kept in rotation during use by means of a small motor. It is claimed that the stroke of the pencil is cleaner and easier.

**The Paper Ring.**—Herr F. Dyck, of Aix-la-Chapelle, has transferred his factory for the manufacture of collodio-chloride paper to Luxemburg. It appears that the ring has omitted to include Luxemburg in its sphere of control, and, as Germany admits Luxemburg manufactures free of duty, Herr Dyck can undersell German competitors by 1s. per quire, or pocket the difference. Probably other German manufacturers may follow his example, and we shall then have an interesting exhibition of the relative strength of patriotism and pecuniary advantage, either on the part of the ring or of the manufacturers.

**Flashlight Accident.**—The *Deutsche Photographen Zeitung* gives a short account of an unfortunate accident which has happened at Berlin in the use of a flashlight mixture. Two photographers, Herren Reiner and Schwarz, were engaged in taking flashlight pictures at a rehearsal, preparatory to the exhibition of a series of living pictures. A violent explosion took place, throwing both photographers to the ground and severely burning their hands and faces. The magnesium powder had been placed on a seat in the middle of the hall, and had been ignited by a cigar end, which had been thoughtlessly thrown away. We gather from another account that the magnesium powder had been mixed with pulverised permanganate of potash. This is one of the safest compounds used for flashlight exposures, and we trust photographers will learn from this unfortunate accident that the greatest care should be exercised when flashlight powders are used, some of them being little less dangerous than gunpowder.

**Photography v. Engraving.**—M. Leon Vidal publishes a sharp criticism, in the *Moniteur de la Photographie*, upon the action of the Paris Municipal Council in voting the sum of 40,000 francs for engraving the pictures at the Hôtel-de-Ville. Several of the principal Paris newspapers have commented upon the subject, and surprise has been expressed that so large a sum should have been

voted, when the work could have been done at far less expense by photography or photogravure. The difference in cost might have been used for the acquisition of other objects of interest. To those who reply that the art of engraving should be encouraged, there is the obvious retort that many other arts contributed to the artistic pleasures of our forefathers, and, if all received due encouragement, the Municipal Council might spend the entire wealth of the city without fulfilling its duty. M. Vidal justly observes that, if a correct reproduction of these works of art is desired, orthochromatic photography is available, and is not only less expensive, but more truthful, than any process of the engraver. As proof of this fact, we may take the interpretation of any one picture by various engravers and compare them. They not only differ among themselves, but they all differ from the original. We may respect the patience, ability, and artistic feeling of the engraver, but it is regrettable that photography should not be used when a facsimile is wanted.

**Nitric Acid in the Pyro Developer.**—In preparing a stock solution of pyrogallie acid with sulphite of soda the addition of a few drops of nitric acid is frequently recommended. The *Photographische Mitteilungen* points out that nitric acid is an undesirable addition, as it is an oxidiser, and tends to reduce the strength of the developer. It is preferable to use sulphuric acid to neutralise the alkalinity of the sulphite of soda.

**Photographic Plates v. the Eye.**—Professor J. Scheiner writes in the *Archiv für Wissenschaftliche Photographie* concerning the application of photographic methods to the exact sciences, and especially to astronomy. In making a comparison between the eye and the dry plate, Professor Scheiner points out that it is the accumulation of the effect of light which gives the plate the advantage. If we look through a telescope of three inches' aperture, and the eye is not fatigued, stars down to the twelfth magnitude may be distinguished, and for this purpose the observation need not exceed ten to twenty seconds. A plate exposed for the same time under similar conditions would only record stars down to the sixth magnitude, and we might infer that the eye is 250 times more sensitive than the plate. From experience we know that an exposure of an hour has to be given to a dry plate with the same telescope, if we wish to obtain a record of the stars we can distinguish with the eye. If we give still longer exposures, the advantage lies with the plate; and, as astronomical exposures have been made of twenty-five hours' duration, it will be readily understood how great is the service photography renders to the astronomer.

#### LEEDS CAMERA CLUB.

##### WITHDRAWAL FROM THE YORKSHIRE PHOTOGRAPHIC UNION SCHEME AND THE AFFILIATION.

At the usual weekly meeting of the above Club, on Wednesday evening, February 8, the President (Mr. W. J. Warren) mentioned that there were two resolutions to be dealt with before he called upon Mr. Burrill to give his lecture on "Photographic Chemicals."

The first and most important item was the question of the Yorkshire Union. As they would, no doubt, have seen from the photographic papers, a meeting was held on Jan. 27 at Bradford, some of their members were present, and representatives also attended from some fourteen or fifteen Societies in Yorkshire, when a resolution was passed "that it was desirable to form a Union of Yorkshire Photographic Societies." Mr. Percy Lund was in the chair, and Mr. Ezra Clough, one of the Secretaries of the Yorkshire Exhibition, explained that the draft scheme had been prepared by some eight members of the Bradford Photographic Society.

The President then shortly read to the meeting the main heads of the proposed scheme, which has already appeared in our columns. Proceeding, Mr. Warren remarked that the interchange of lectures was probably the most important feature. First of all, a list would be made out of gentlemen in the county who would be willing to give three, six, or nine lectures. These would form a joint batch of lecturers, and of these every society would have two, and every society would also have one lecture in addition for every lecture which it gave to the common pool. There was also to be kept a lecturing staff, and prominent men in different parts of the country, who would receive a certain fixed fee, and pay a percentage of such fee to the Union. Those were roughly the heads. He was bound to say that at the meeting, at which the Leeds Camera Club were represented by Messrs. Bourke, Gash, Silcock, Rust, and himself, there was a considerable amount of reticence when the resolution was proposed, and probably perhaps not more than one-third of the gentlemen present voted. The others seemed to be waiting for



something to turn up. However, the Committee had considered this question very carefully last night, and he did not think there was any difference of opinion on the Committee with reference to the Union, and, after careful consideration, they had voted for a certain resolution, which he would read as follows—"That, in the opinion of the Committee, it is not desirable that the Leeds Camera Club should join the proposed Yorkshire Union." It was not necessary that the Committee should come to the members with regard to the matter, but at the same time it was very reasonable that they should do so, and ask them to decide this question. The Committee had said that, in their opinion, union was not desirable, and he hoped the members would look at it in the same way as the Committee had done, and confirm the resolution. The opinion of the Committee was that they had to look at it selfishly. The Club was not a charitable institution to give lectures to some societies; they had to run for their own benefit, and the Committee were of opinion that there were no benefits to be obtained from the Yorkshire Union to the Leeds Camera Club. They had compared the probable syllabus which would occur if they were members of the Union, and, even if they got the best men of the country giving lectures in exchange, they would gain very little by the bargain, and the syllabus for 1899 would be no better than the one for 1898. They also looked at it from another point of view, and he thought a reasonable one. They said we have seen the experience of other attempts at federation, and these have led us to believe that whenever you attempt to unite conflicting atoms you have got a very thick thing on. Now, every society in Yorkshire is a conflicting atom, and every society of the Union would be conflicting atoms. We judge from the gentlemen who promoted the scheme, and from the Chairman and Secretary, that it looked as if the first conflicting atom should be met in order that the thing should be equalised. There were twelve conflicting Bradford atoms to be dealt with. It was all Bradford, and, instead of being united to the whole societies of Yorkshire, at present the proposal seemed as if there were to be united to eleven Bradford gentlemen. If they were going to have any fighting to do or hard work, the opinion of the Committee was they had better do it for their own Club than a Yorkshire Union. Whatever energies they could put forward were infinitely better put forward for their own Club exclusively. It was perhaps a selfish way of looking at it, but the Committee had a duty to perform to their members, and that was to work as hard as ever they could for their own Club, and not waste their energies on outside matters. That was the reason why he proposed this resolution, and he thought he might say it was, to a certain extent, the reason the gentlemen of the Committee voted for it.

Mr. Warren then formally moved the following resolution—"That, in the opinion of the Leeds Camera Club, it is not desirable that the Club should join the proposed Yorkshire Union," which Mr. Elliff seconded, and, on being submitted to the meeting, was carried unanimously.

Mr. R. Bourke then rose to propose resolution No. 2 as follows—"That, in the opinion of this Committee, and while agreeing with Mr. Harold Baker in wishing to see the Royal Photographic Society take its proposed place as the leading society of the country, which at present it does not do, especially with regard to its exhibitions, the Leeds Camera Club severs its connexion with the Affiliation Committee of the Royal Photographic Society as at present constituted." In placing the proposition before the meeting, he said that it would require no words from him to commend the resolution to their approval after the vote they had just taken. It was his opinion now, and the opinion of the Committee, that the time had come when the Leeds Camera Club could fairly stand apart from combinations, and therefore he had submitted the resolution now before them at the meeting of the Committee last night, when it was carried unanimously.

The resolution, having been seconded, was then put to the meeting and carried.

#### THE UNION OF YORKSHIRE PHOTOGRAPHIC SOCIETIES.

The adjourned meeting in connexion with the movement for forming a Union of Photographic Societies was held on the 9th inst., at the Bradford Grammar School. Mr. Percy Lund again occupied the chair, and there was a large attendance.

It transpired that the number of the members of the societies who were favouring the scheme was as follows: Brighouse, 87; Batley, 40; Beverley, 50 (estimated); Bradford, 200; Hull, 156; Heckmondwike, 80; Keighley, 64; Leeds, 150; Sheffield, 46; Rodley, 12; Wakefield, 12.

Mr. Clough said, as to Halifax, he knew that a member of their Committee had stated his Club were in favour of the scheme, but there had been no opportunity of bringing it before the Committee. As to Huddersfield, it would not be fair for him to say. He was most anxious not to commit any one, but, so far as he knew, they were in favour. He was placed in an unfortunate position. There were certain letters in his possession from secretaries who were in favour, but he was not prepared, as a matter of diplomacy, to commit a society until he had received their final answer, when he would read it, but the opinion of a secretary he was not prepared to take. Leeds was the only opposition, with the ex-

ception of Rotherham Society, last week, who had rejected the scheme unheard.

The Chairman stated that the circular should have asked for an expression of opinion from outside societies who were unable to be represented that night, and who were not likely to come to the meetings, this was the first thing to be done; there were still practically twenty societies in Yorkshire from whom they had heard nothing at all.

The consideration of the proposed constitution was then proceeded with. It was resolved that the Union consist of a President, three Vice-Presidents, Recording Secretary, paid Secretary, Treasurer, Committee, Delegates, and Associates.

Mr. Bourke was of opinion that every encouragement should be given to Associates to join.

The Chairman: We want to prevent the larger societies dominating the smaller societies.

Mr. Bourke: Could not it be arranged that there could be some representation on the Committee?

The Chairman: How are Associates to elect themselves? He went on to explain, that supposing the Union engaged a lecturer from, say London, for a series of lectures, he would take less in proportion for such an engagement than if he had but a single engagement. This would be a source of economy to the societies.

Mr. Georgeson: Surely it was never understood we could get lecturers for this nominal sum.

Mr. Ezra Clough thought it would be an advantage to get Mr. Harold Baker to deliver a series of lectures.

Mr. Georgeson: It would be better to get Mr. Baker for the lectures, and our subscriptions to remain at 15s.

The Chairman remarked that what was before the meeting was the following: "Societies can enjoy the privilege of the Union on the following terms: Those having a membership roll of fifty or less, 10s. per annum; 15s. for those having a hundred, or less; and 20s. for all above that number. These societies shall be allowed to send to the elective body one, two, and three delegates, respectively, according to the fee; no Society, whatever may be its membership, shall be allowed more than three delegates.

The Hon. Secretary said the advantage of the Union would be that it would be able to do something better for the societies than they could do for themselves.

Mr. Sheard suggested that six was a reasonable number of delegates to appoint, and the Chairman agreed with this.

Mr. Sheard thought the delegates should have the power to elect six Associates on the Committee of twenty-five.

After some further discussion, the Chairman announced that the Committee would be increased plus the Associate portion of the Committee.

It was also decided on the following: "All members of societies who had joined the Union became Associates, and are entitled to attend the Annual Excursion, the General Meeting, and any Union lecture, wherever they may be given. Any person may join the Union as Associate by paying a subscription of 2s. 6d. per annum. Prior to this, however, a lengthy conversational discussion took place as to whether the Associate should not pay 5s. instead of 2s. 6d.

The Chairman thought they did not desire that societies who had done nothing in the movement should send individuals so as to upset the balance of power. They would remember at the last meeting they decided on 2s. 6d. in preference to 5s.

Mr. Bingley said in another society any member could become an Associate on payment of 5s.

The Chairman pointed out that there had been nothing decided as to Associates having voting power.

They would see it was not final. Delegates would have this to work upon, and it was only a minor point. It was no use having the whole thing printed again. Delegates would have formed their opinion at the right time.

It was resolved to defer the question of appointing a paid Secretary.

The following was also agreed upon:—

"The Elective Body: These delegates shall form the elective body of the Union. This body shall elect the officers and Committee, the numbers to consist of not less than twenty-five, to form the Committee and officers, which shall have power to transact all business of the Union. The Committee and officers shall be nominated a month prior to the General Meeting, and elected by voting papers sent to every delegate by post, to be returned five clear days prior to the General Meeting. This Committee shall elect the officers of the Union. The Committee and officers shall retire annually, but be eligible for re-election. The delegates shall elect the number of Associates to act on the Committee. All who vote must have paid their subscriptions."

Mr. Sheard thought it would be well to have only half the officers retire.

The subject of a 10s. subscription was again introduced.

Mr. Heape spoke in favour of it, and

The Chairman said he was against any increase at present. They did not yet know what they might develop into—the scheme was as yet only on paper.

Mr. Ormerod: I propose we haven't a minimum subscription of 10s. 6d. from each society, but pay 3d. a head.



The Chairman: This matter was considered at the last meeting. It was decided it must remain the same.

Mr. G. Bingley: I am afraid if it is put to 30s., very few societies will have anything to do with it.

Mr. Georgeson: I propose that the subscription stands at the present figure until we have a delegate elected from each club.

The Chairman then took the feeling of the meeting, and declared that it was in favour of the original suggestion.

A gentleman who was present intimated that he would bring the matter forward at the next meeting.

On the motion of Mr. Sheard, seconded by Mr. Georgeson, and supported by Mr. Bourke, it was decided that the previous recommendation should be passed, though there appeared to be some difference of opinion on the question of secretary.

The "Probable Facilities of the Union" (which have already appeared in these columns) were then formally gone through and agreed to.

A suggestion was made by Mr. Briggs (Wakefield) to hold the meetings of the Union monthly.

Mr. Ormerod moved as an amendment that the meetings be fortnightly.

On a vote being taken, thirteen votes were recorded for the amendment and five against.

The amendment was declared carried.

The next question to be considered was the night of meeting.

A proposition was made that the next meeting should be held at Bradford on March 1.

Mr. Ezra Clough intimated that it was utterly impossible, owing to a previous engagement, he could attend on that date, and after some discussion it was decided to fix the meeting for Thursday, March 2.

The Chairman pointed out that it would be advisable for the members of the Union to decide on some description of a distinctive badge, to be available for any one connected with it.

It was resolved that this matter be left over for consideration.

The Chairman said it appeared to be somewhat doubtful, in the hurry and confusion of closing the previous meeting, as to whether it had actually been decided to form the Union. Possibly the fault lay with him, but he would call upon Mr. Ormerod to move that the Union be formed.

Mr. Ormerod proposed the motion, which was seconded by Mr. Heaps and carried.

## THE L. AND P. SUPPER.

BY A GUEST.

"A joint of mutton and any little kickshaws, tell William, cook."—*Shakespeare*.

"By your gracious patience I will a round and unvarnished tale deliver."—*Ibid*.

Our photo motor car stopped at the witching hour of 7.35 at the sign of the Ancient Cygnet, a hostel close to the precincts of that temple whereof the lamb and flag are a fitting sign manual.

The foggy, groggy gloom of printer's paradise was enlivened by the majestic roll of well-filled growlers pulling up in rapid succession at the door and discharging their loads of photographic citizens on pleasure bent, for was it not the auspicious occasion of the L. and P. supper and social after a lapse of fifteen years? Rival and ragged touts waylaid the unwary fare as he alighted, in the hope of obtaining the much-prized end of cigar or cigarette, that even the blind beggar cannot resist when he smells its fragrant odour wasting its sweetness on the desert air in the neighbouring gutter—his instinct never errs, and he gauges its position and grabs the smouldering stump with the accuracy of an American gunner.

My friend and I were late and the company was seated, but we were received by a cordial gentleman, resplendent in a velvet coat, and smiles, who wanted to part us till after dinner, but we were obdurate, and got a seat together at the end of a table in spite of mild rebuke; and it was well for me, for, had my friend left me, it would have been some hours before we should have met again.

From the vantage point assigned to me, I gazed around with admiring glances at a goodly gathering, and I hope I may be pardoned for following in the footsteps of one of your recent contributors by perpetrating another parody on *Inglisby*:—

The president sat in an easy chair;  
Artist, and servant, and others were there;  
Two or three eds., and a writer or two,  
Three colour men, and amateurs, who,  
With a great many more, of even degree,  
Made quite a goodly company.  
And they smiled at each other cordially.  
Never, I swear, was a meeting where,  
Whether in town or country or not,  
The air was so frightfully stuffy and hot."

Yes, it was extremely hot, and fresh air was decidedly at a premium; but then a madman suddenly opened a window quite close to me, and had it not been for the long hair of my neighbour, which kept the draught

away from me, I should now be spending my week's end in bed. But I am digressing, and must continue my parody:—

"In and out through this social rout  
Four little waiters kept popping about.  
Here and there, like dogs in a fair,  
Touching coat-sleeves and pates with dishes and plates.  
Jim and John and Joey, we howl,  
Bring the potatoes and give us some fowl.  
With saucy air Joe approaches the chair  
(After the lapse of an hour or two),  
Saying mutton and beef's all they can do;  
And we sighed in his face and thought of the place  
Where the cooking is good and the prices right  
(Nor have you to wait for it half the night).  
Our friends, too, were raw, like the beef they saw,  
And they wanted a punch at the caterer's jaw."

Yes, Mr. Editor, it is just as well that there were "no men of unbounded stomach" present, and that the great Sala is at rest, for, had he been at the feast, his pen would have dried up in the agony of suspense caused by the ignorance of some of the waiters and the fearful delay between the courses.

I once heard a tale of an ignorant old lady who was on a visit to town for the first time, and whose friends decided to take her to the theatre, and showed her a programme beforehand. As the hour approached for this lady to depart, her friend who was to go with her noticed that there was a rather large box in the hall, and she naturally asked what that was for.

"What for?" reiterated the old lady. "Why, to take with us, of course."

"But what do you want a large box with you for? They won't let you take it in."

"Not take it in?" she replied. "Why, it's full of food. There's to be an interval of two days between the first and second acts."

Now, some of us felt like that at this supper—we wished we had brought our own food, for we literally got nothing to eat, and were a tremendous time in not eating it. Two gentlemen not unknown in the photographic press waited twenty-five minutes between one course, fifteen minutes another, and over twenty minutes before they could get a drink. I speak with authority, as my own Waterbury timed it.

The waiter at our table was a shock-headed youth—almost in his chrysalis state—to whom we said, "Champagne list" as plainly as we could. Well, he just opened his eyes so wide I thought he'd never get 'em back again into his head. He disappeared for fifteen minutes. Again we reiterated "Champagne list." He shook his shaggy mane and then brought an antiquated, dirty, thumb-marked card. We said, "A bottle of Bollinger." Again the dead-codfish look came into the creature's eyes; his mind could not grasp the magic word, and we sent at last in despair for the head waiter, and got, after another long interval, the coveted beverage.

Some one remarked that this was a "beef and beer horror," and so it was, but worse was to follow. An excellent programme of vocal and instrumental music and other et-ceteras had been arranged, and a genial gentleman, rejoicing in a compound patronymic, and hailing from the gallant little land of Wales, sat down to the piano.

He played one minute amid a torrent of hisses, not at the pianist, for he is a most accomplished musician, but at the quality of the instrument.

Does not some one say in the *Merchant of Venice*, "The vile squeaking of the wry-neck'd fife?" That is a mild expression as compared with those lavished by the whole company on that ancient and beer-stained jumble of jangling strings erroneously called by the manager the piano, and, try as they would, the wretched thing spoilt the pleasure both of the performers and audience.

The speeches savoured somewhat of the mutual admiration society sort, each speaker vying with his predecessor in the amiable art of flattering his neighbours, and, although the two-minute rule was strictly enforced, expressions of congratulation on the success of the Society and its past and present members were freely heard and duly appreciated, and we broke up at a reasonable hour, only regretting the dreadful dinner and the horrible piano; and, if the Society holds another "supper," let us trust it will be at one of the large West-end restaurants, where, for the same fee (3s.), a far better menu can be had with suitable attention and an instrument that is worthy of its name.

## CHEMICALS USED IN PHOTOGRAPHY.

BEFORE the Leeds Camera Club, on Wednesday, February 9, "Chemicals used in Photography" was the subject for consideration, and it was dealt with by Mr. B. A. Burrill, F.I.C., of the Leeds Photographic Society. Every photographer, said Mr. Burrill, should, in order to do good work, know something of the materials he is using. The science of chemistry laid down certain laws and principles which must be adhered to, or photography would be impossible. An elementary knowledge of those principles was, therefore, not only advisable, but necessary. Chemists divided all substances into two classes, elementary



and compound, which united with each other in certain definite forms. Their atoms had a numerical value and weight, and they combined in the exact proportions of these atomic values, any excess of either remaining uncombined. Applying, then, these principles to the development of the photographic plate, the solutions used were divided into certain groups. First there was the reducer, such as pyro, metol, or any of the others, which reduced to the metallic state the silver salts acted upon by the light; another was the accelerator, such as ammonia, alkali, or carbonates, which were necessary to start the action of the reducer. Then there was the restrainer, such as the bromides, which prevented the too violent action of the reducer. Then came the water, which was the solvent and diluent; and after that the sulphite, to prevent staining. The absolute necessity of using pure water was demonstrated by Mr. Burrill showing the action of impurities in well and tap water in contrast with distilled water, and he showed how an operator could when in any district away from home test the water, and, having found its principal impurity, counteract its effect by precipitation of its objectionable features. Dealing with the accelerators, the lecturer advised all who used ammonia to get it of full strength, and at once dilute it to a ten per cent. solution, otherwise its gases, being so very light, were escaping every time the bottle was uncorked, so that they never had a standard strength of solution. The potash and soda hydrates were explained, and their essential features demonstrated by experiment. In the carbonates the lecturer clearly showed the difference between the ordinary washing soda and the pure soda carbonate, the washing soda containing thirty-seven per cent. of carbonate, the rest being water, so that, in mixing their solutions, they must use the exact weights and substance as given by the maker's formula. Soda carbonate is the best for pyro, but for metol and developers of that class the potash carb. is to be preferred. The action of the restrainers was then demonstrated, Mr. Burrill showing how an unrestrained developer must produce a slight deposit of metallic silver over the whole surface of the plate. He advised the operator always to use potash bromide with carbonates, for ammonium bromide would cause decomposition, giving off ammonia gas, and so altering the character of the developer. As to sulphite, he pointed out that it was absolutely necessary for this to be kept from the air, or sulphate was formed, which was most detrimental, and the cause of many of the ready mixed developers, sent out by the makers, giving such poor results, was largely due to this factor. Its preservative qualities, when used with pyro, were explained, a little citric or sulphuric acid being added to give an acid reaction. Mr. Burrill strongly advised operators never to use a combined hardening and fixing bath, and he demonstrated by experiment the actual results of so doing. If they used the alum bath, wash thoroughly after developing, and again before they put it in the hypo bath. The hypo or fixing bath at once removed all the unaltered silver from the plate, and the lecturer explained and demonstrated its chemical action. For those who preferred an acid fixing bath, he advised them to use soda metabisulphite 1 ounce, hypo 4 ounces, and water 20 ounces. The hypo bath was best made up a day or two before, and then decanted off, some slight deposit generally being formed. The best eliminator was water, and plenty of it; but a solution of 2 parts of Condy's fluid (permanganate of potash), diluted to 100 parts with water, could be used, adding more of this solution until the pink colour remained permanent, and then no hypo would be present.

## Our Editorial Table.

### A WORD ABOUT WELLINGTON PAPERS.

Published by Wellington & Ward, Elstree.

Like everything that comes out of Elstree, this little book is distinguished by style and good taste. To the users of the Wellington papers the explanatory notes and instructions given will be of immense service in the manipulations of those papers. As showing what good prints are obtainable on them, there are four charming bromides on varied surfaces bound up in the book, the negatives having been taken by Mr. Wellington and Mr. Ward. *A Word about Wellington Papers*, with the four pictures, is sent free to applicants.

### THE DIAMOND RETOUCHING VARNISH.

Manufactured by C. Brangwin Barnes, 21, Alloa-road, Deptford-park, S.E.

This new retouching varnish, which Mr. C. Brangwin Barnes, an experienced photographer, is issuing, gives a surface as easy to work upon as paper.

Being practically colourless, it does not interfere in any way with the printing qualities of the most delicate negative, does not become tacky in the hottest weather, and does not decorticate under the influence of fog or damp. It is hard and unscratchable, and can be retouched upon, and printed from, while the negative is still warm. A sample negative, coated with the Diamond Varnish, afforded us the opportunity of testing and verifying the claim made in its behalf.

### THE "KALKO" BACKGROUND PAINT.

Manufactured by the Vanguard Manufacturing Co., Maidenhead.

MANY a photographer will welcome the opportunity of purchasing a shilling tin of this material which, when converted by hot water to the consistence of thick paste, can be used for painting upon a variety of surfaces that are useful for photographic backgrounds, such as paper, cheesecloth, canvas, wood, and stone. The manufacturers point out that a few stout newspapers (such as the *Times*) glued together at the edges and coated with "Kalko" paint make an excellent background or lantern screen. "Kalko" is made in four tints: dark slate grey, medium brown grey, cream, and snow white. The contents of a package will give two coats to an average-sized background. One coat is, however, generally sufficient. The directions for use are: Put the contents of a package into a basin, or other suitable vessel, and add one pint of hot water. Only a little of the water should be added at first, and the mixture should be stirred well until it forms a thick smooth paste. The rest of the water may then be slowly added with constant stirring until the paint is quite smooth and creamy. It is then ready for use, but works better when cold. Apply smoothly with a large brush. The work need not be sized, or prepared in any way. No studio should be without a supply of "Kalko" background paint.

### GRAVURA.

Manufactured by the Paget Prize Plate Co., Watford.

LAST week we referred to the receipt of a number of specimen prints on Gravura, the new gaslight development paper of the Paget Company; and, from the fact that the range, richness, and beauty of the colours of these pictures, which are obtainable by exposure and development alone, have been much admired by those who had seen the prints at our office, it is fair to suppose that, in placing a paper of this kind on the market, the Paget Company has happily hit popular taste in the matter, and that Gravura will be exceedingly popular with those who like a development paper giving colours ranging from black to bright red. We have tried the paper with satisfactory results—it is not inconveniently slow, that is, with a negative of average density it requires for black colours an exposure of about two minutes a few inches from a gas flame, and thus it is handled and developed without fear of fog in a room well illuminated by gas. We append the chief instructions for the principal manipulations, by which it will be seen that by modifying the exposure and development factors, if we may so term them, command is easily obtained over the colours of the images.

The packets may be opened and printing frames filled in an ordinary gas-lighted room—say not nearer than six feet from the flame, or in daylight, in a room with the blind drawn down and not too close to the window. Development may be carried on under the same conditions.

The exposure required for black tones by contact printing under a negative of medium density will probably be from one to two minutes at, say, four inches from an ordinary gas flame, or from one second upward in diffused daylight inside a room a few feet away from the window, or half an inch to an inch of magnesium wire burnt at a distance of twelve to eighteen inches:—

#### Developer.

Hydroquinone .....	1 ounce or 55 grains or 6 grammes.
Metol.....	1 " " 14 " " 1.5 "
Sod. sulphite recryst....	8 ozs. " 1 ounce " 48 "
Sod. carb. crystals .....	10 " " 1 1/2 " " 60 "
Pot. bromide .....	16 grains " 2 grains " 25 "
Water to make.....	1 gallon " 1 pint " 1 litre.

For black tones only the paper, after exposure, may be wetted for a few seconds in order to make it limp and lie flat. It may then be either developed in a clean dish, by pouring the developer over, or laid on a sheet of glass and the developer rapidly painted over its surface with a brush or tuft of cotton-wool. In either case the developer must be spread quickly and evenly and without bubbles: we prefer the dish. Development for black tones takes place very quickly, and will probably be completed in from fifteen to thirty seconds. As soon as the required stage is reached take the print out at once, dip quickly in water, and immerse in fixing bath, keeping it moving in this bath for the first few seconds:—

Hypo. ....	3 ozs.
Water .....	1 pint.

Fix for about ten minutes and use fresh solution for each batch of prints. Wash thoroughly in running water for about an hour (not longer), or in several changes. Do not expose to strong light until thoroughly fixed.

If an exposure, say, five or six times as long as required for black tones be given, and a diluted and restrained developer be employed, it will be found that the image will take much longer—perhaps one or two minutes—to come out, and when it first appears will be of a yellow or pale pink colour. As development progresses this colour will gradually change, the red becoming stronger and deeper, changing to a brown red



then through successive shades of brown to olive green. [This description applies to the appearances as seen by gaslight or other yellow light.] Now if the print be taken out at any stage of this process, fixed and finished, it will be found, when dry, to be of nearly the same colour as when taken out of the developer, except that it will have gone back a little towards orange and will appear stronger. It will depend upon the exposure whether the correct stage of development as regards detail and strength of image had been reached when the desired colour had been arrived at. For example, suppose that a red print had been desired, but that, when the red stage had been reached, the image was not sufficiently developed out, and that therefore you had to go on longer. You would get a sufficiently developed image, but the brown or brown-red stage would have been arrived at and a print of corresponding colour would result. In order to get a red print you would have to expose longer, so that the image had developed sufficiently by the time the red stage had been reached. On the other hand, if the exposure had been too long the requisite detail would have appeared before the red was deep enough; and, if taken out, the print when finished would be yellow or orange; if left in until red, it would, when finished, be too flat and over-printed.

Calling black the bottom of the scale, and pale yellow the top, the higher the colour desired the longer the exposure, and the more diluted and restrained the developer must be.

#### LA PHOTOGRAPHIE ANIMÉE.

By EUG. TRUTAT. With a Preface by J. Marey. Paris: Gauthier-Villars et Fils, Rue des Grandes Augustins.

Those who are interested in the subject of animated photography will find this book a useful addition to the library shelves. M. Marey, the famous chrono-photographer of the movements of animals, &c., contributes a preface to the volume which, in return, draws largely upon Marey's own work, *Mouvement*, for the matter of some of its earlier chapters in which the familiar references to persistence of vision, and the various forms of the zoetrope are dealt with. The growth and development of the modern cinematograph is then traced down through the work of Muybridge, Edison, Anschütz, and others, and the greater part of the volume is taken up with descriptions of French apparatus and the manipulations necessitated in the production of animated photographs. The author appears to be unfamiliar with the fact that English inventors have had something to do with animated photography; but, notwithstanding this defect, the book is a very useful one. It has many illustrations and is priced five francs.

#### CATALOGUES RECEIVED.

Henry M. Ward, 41, Belgrave-avenue, Leicester.

MR. WARD, who works for the trade, has sent us his latest list. His specialties are sepia and warm-toned enlargements in bromide, and finishing in monochrome and water colours. Specimens of his "Auro" enlargements in rich, warm browns, which he submitted to us, confirm us in the opinion we originally expressed of them, namely, that they are attractive and effective, and should command the patronage of photographers, now that the public shows unmistakable signs of taking to warm-toned photographs.

#### THE ELGE COLLECTION OF CINEMATOGRAPH FILMS.

L. Gaumont & Co., 25, Cecil-court, Charing Cross-road, W.C.

We recommend this catalogue to those who contemplate organizing entertainments in which animated photography is designed to play a part. Nearly 200 subjects are listed, and to each film a brief and pointed description is devoted. Most of the more attractive themes are illustrated, so that an idea of their nature is directly obtainable. The three or four nudes seem calculated not to offend against the canons of good taste or propriety. We note that the Life of Christ has supplied inspiration for the preparation of one series of films. Opinions will always, we may suppose, be divided as to the wisdom or expediency of subjecting the sacred writings to contribution for purposes of photographic illustration. Our own opinion is that they are best left alone. Nothing is lost by such a course of reverential reticence; and, moreover, by not showing them, there is the certainty that the risk of giving offence has not been run. We hope these remarks will be taken in the spirit that animates them, viz., a desire to save photography the reproach of being improperly used.

Wilfred Emery, 3, Soho-street, W.

MR. EMERY'S latest catalogue of 22 pages, contains mention of the "Apek" specialties: hand-cameras, studio cameras, shutters, &c., and prices for developing, printing, and enlarging are also given. Photographic materials of a miscellaneous character make up the remainder of this illustrated price-list, which is sent free to applicants.

## News and Notes.

**SOUTH LONDON EXHIBITION.**—Entries for this Exhibition close on February 18. Photographs must be delivered by the 25th.

**PHOTOGRAPHIC CLUB.**—February 22. Travellers' Night. "Cumberland Fells and Lead Mining." Slides by Mr. W. D. Welford.

**ROYAL PHOTOGRAPHIC SOCIETY.**—Tuesday evening, February 21, at 12, Hanover-square, at eight p.m., "Demonstration with Violet Electric Waves for Actuating Photographic Apparatus and for Photographing Lightning in Daylight," by F. H. Glew.

**J. H. DALLMEYER, LIMITED.**—We are informed that this Company last week declared and paid a dividend at the rate of eight per cent., making with the interim distribution a total of twelve per cent. for the year. We congratulate the Company on its prosperity and progress.

**SOUTHAMPTON CAMERA CLUB** (established 1896).—This Club's meetings are held at the Kell Memorial Hall, Bellevue-road, Southampton, on alternate Monday evenings. The officers are:—*President*: Rev. G. C. Bennett.—*Committee*: Messrs. Jarvis, Evens, Winzar, Stone, and Walter.—*Hon. Treasurer*: Mr. W. H. Trigg.—*Hon. Secretary*: S. G. Kimber, Oakdene, Highfield, Southampton.

At the South-Western Polytechnic, Chelsea, last Saturday, Lady Amptill distributed the prizes and certificates. In the Photographic Section the following awards were made:—Mr. Arthur Lockett, 1st prize, honours grade, 2/ (Salters' Company), silver medal and certificate (City and Guilds); Mr. Walter Atchison, 1st prize ordinary grade, 1/ (Salters' Company), silver medal and certificate (City and Guilds).

**THE SANDELL FILMS AND PLATES, LIMITED.**—Mr. J. T. Sandell writes us as follows: "I beg to inform you that by the help of a powerful Syndicate I have succeeded in reconstructing my Company, lately known as the Sandell Works Company, Limited. In future the new Company will be known as Sandell Films and Plates, Limited. The address will be as heretofore, namely, Selhurst-road, Norwood Junction, S.E. The business will be under my management."

In a recent number of the *Journal für Gasbeleuchtung* M. Drossbach has an interesting note on the theory of incandescent gas-lighting. According to the author, the light given by an Auer mantle is due to the influence exercised by the molecule of oxide of cerium. This influence consists in bringing the calorific vibrations of the thorina into harmony with the calorific waves of the flame, which are then transformed into luminous waves. The author has prepared nitrates of thorium and cerium as pure as possible, and he found that the maximum illuminating power was given by a mantle containing 99.1 per cent. of oxide of thorium, and 0.9 per cent. of oxide of cerium. The substitution of zirconium for thorium gives bad results. He concludes that oxide of cerium does not possess any chemical or catalytic action. It has been stated that thorina prepared from the nitrate is always very voluminous, and that the great surface it offers to the flame favours the catalytic action of the oxide of cerium. Now the author shows that the sulphate, which makes a compact oxide, gives as good results as the nitrate.

**SOLUBILITY OF CERTAIN SULPHIDES IN GLASS.**—It is known that sulphides of the heavy metals, and especially cadmium sulphide, are dissolved unaltered by melted glass, which enables one to obtain a number of colouring substances for glass. In the production of glass coloured with cadmium sulphide, certain difficulties had formerly to be surmounted; to-day, fancy glass, coloured with cadmium sulphide, under the denomination of "Kaisergelb," is manufactured on a large scale, which is distinguished from the brownish-yellow silver glass by its brilliant deep-yellow colour, with a faint tinge of green. As regards the solubility of other sulphides, we would mention the following mixtures: A. Sand, 65 decigrammes; potash, 15 decigrammes; soda, 5 decigrammes; lime, 9 decigrammes; molybdenum glance, 3 decigrammes; sodium sulphide, 2 decigrammes. From this results a handsome, dark red-brown, ruby colour. In thin layers the glass appears light brown-yellow; flashed on opal, it turns a dirty black-brown, which appearance is, by the way, also observed with other sulphides, and may be traced back to the fact that the sulphide precipitates from the rather concentrated solution on repeated heating. B. Sand, 50 decigrammes; potash, 15 decigrammes; soda, 5 decigrammes; lime, 9 decigrammes; molybdenum glance, 1 decigramme; sodium sulphide, 2 decigrammes. This gives a yellow which strongly tarnishes glass. C. Sand, 10 parts; potash, 3.8 parts; soda, 0.27 part; lime, 1.64 parts; molybdenum glance, 0.03 part. This gives a reddish-yellow glass with a very handsome tinge of red. D. Sand, 100 parts; potash, 26 parts; soda, 1.8 parts; lime, 12 parts; cupric sulphide, 1.7 parts; sodium sulphide, 1.8 part. This yields a sepia to sienna coloured glass, dark brown, no longer transparent in a tolerably thick layer, but clear and undimmed. By heating, it turns dirty dark brown and dim; thinned with cutting glass and flashed on opal, agreeably warm sepia shades are produced which, obtainable in any desired intensity resemble the natural paper of the painters, and are especially suited as a background for designs or glass painting. Experience has shown, however, that glass coloured with sulphides is not so easy of production as that coloured with silicates. This is for the most part owing to the nature of the sulphides, to their ready oxidizability, their comparatively greater volatility, and to the fact that metallic sulphides are entirely different from the substance of glass, and cannot therefore be melted together with it in any desired quantity.—*Diamant*.



## Patent News.

THE following applications for Patents were made between January 30 and February 4, 1899:—

MAGAZINE CAMERA.—No. 2189. "Photographic Magazine Camera." Communicated by H. D. Haight and L. L. Cossitt. Complete specification. R. E. PHILLIPS.

ANIMATED PHOTOGRAPHY.—No. 2372. "Improvements in Apparatus for Photographing Moving Objects upon a Strip of Moving Transparent Film, and Projecting Pictures so taken." A. V. MORTLEY.

ANIMATED PHOTOGRAPHY.—No. 2376. "Improvements in Apparatus for Displaying 'Living' Pictures." A. B. LANGHAM.

PLATE AND FILM CHANGING.—No. 2457. "Improvements in or relating to Mechanism for Changing Photographic Plates or Films." C. J. BANNISTER.

DISHES.—No. 2473. "Improvements in or relating to Dishes used for Developing or other Operations in Photography." Complete specification. J. ROBINS.

ANIMATED PHOTOGRAPHY.—No. 2575. "Improvements in Apparatus for Taking, Projecting, or Inspecting Series of Photographs." W. BRITAIN.

ANIMATED PHOTOGRAPHY.—No. 2582. "Improvements connected with Apparatus for Displaying Photographs and Transparencies, generally Cinematographically, with Coin-freed Appliances." W. S. SIMPSON.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
20	Barnet and District .....	Lantern Night.
20	Birmingham Photo. Society ..	Last Day for receiving Entries for Annual Exhibition.
20	Bradford Photo. Society .....	Trade Demonstration. A. C. Baldwin.
20	Camera Club .....	Glaciers and Fjords in Bergen District, Norway. Horace W. Monckton, M.A.
20	Darwen .....	Prize Slides.
20	Kingston-on-Thames .....	Rome and Naples. A. Vandendriesche.
20	Richmond .....	Demonstration of Velox Paper. John J. Griffin & Sons, Limited.
20	South London .....	The Rotterdam Excursion, 1898. By those who went.
21	Birmingham Photo. Society ..	Social Evening.
21	Bootle .....	Demonstration: The After-treatment of Bromide Prints. Thomas A. Dodd.
21	Gospel Oak .....	Demonstration with Velox Paper. Messrs. Griffin & Sons.
21	Hackney .....	Development. Jno. H. Gear.
21	Iale of Thanet .....	Hand-camera Work with the View to Making Enlargements. John H. Gear.
21	Leeds Photo. Society .....	Instantaneous Photography. H. B. Buckley.
21	Lewisham .....	Hints on Printing. T. P. Rogers.
21	Rotherham .....	Photo Squeegee Work. J. Leadbeater.
21	Royal Photographic Society ..	Demonstration with Violet Electric Waves for Actuating Photographic Apparatus, and for Photographing Lightning in Daylight. F. H. Glew.
22	Oroydon Camera Club .....	Practical Notes on Outdoor Work with the Camera. Rev. A. H. Blake.
22	Leeds Camera Club .....	Exposure and Development. The Members.
22	Photographic Club .....	Cumberland Fells and Lead Mining. W. D. Welford.
23	Ashton-under-Lyne .....	Class for Beginners: Trimming and Mounting.
23	Camera Club .....	Some Eccentricities of the Law of Copy-right. H. Bentwich, LL.B.
23	Liverpool Amateur .....	Yorkshire Dales. G. E. Thompson.
23	London and Provincial .....	Open Night.
23	Oldham .....	Stereoscopic Photography. W. A. Hepburn.
23-25	Woolwich Photo. Society .....	Annual Exhibition.
24	Croydon Microscopical .....	The Selection of a Suitable Printing Process. J. A. Sinclair, F.R.P.S.
24	Plymouth .....	Demonstration: The Platinotype Process. H. J. Hissett.
25	Birmingham Photo. Society ..	Fourteenth Annual Exhibition. Private View.
25	South London .....	Last Day for Delivery of Pictures.

### ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 14.—Annual General Meeting, Mr. Chapman Jones, F.I.C., F.C.S., in the chair.

#### NEW MEMBERS.

Fifteen candidates for membership were nominated, and six, nominated at the last Ordinary Meeting, were elected.

#### AFFILIATION.

The HON. SECRETARY announced that the Brierly Hill and District Camera Club and the Ludlow Photographic Society had been admitted to Affiliation.

#### THE REPORT OF THE COUNCIL.

The CHAIRMAN moved the adoption of the Report of the Council for the year 1898, which was taken as read.

Mr. T. SEBASTIAN DAVIS seconded the motion, remarking that the report showed that the Society was in a most satisfactory condition. He called particular attention to the following paragraph:—

"Since the Crystal Palace Exhibition there have been signs of a more or less general desire that the Society's Annual Exhibitions should be more representative of photography generally than has hitherto been usual. The favourable reception given to the remarks on this subject by the Earl of Crawford in his Presidential Address encourage the Council to believe that a larger and more comprehensive Exhibition would be desirable if it can be carried out under arrangements which would secure the Society against loss. With the scheme of new premises in hand they have hesitated to bring this subject forward, but it is one which will have to be dealt with very soon, and they would be glad to learn the general feeling on the subject."

He expressed the opinion that the Exhibition should be fully representative of all classes of pictures produced by photography, and said that, although on the last occasion most of the exhibits were very interesting and suitable, there was a lamentable dearth of examples of many phases of photography, especially of portraiture and landscapes of an ordinary and every-day character. He considered also that a greater liberality in the distribution to members of complimentary tickets for the Exhibition would result in an ultimate gain to the Society, as most of the persons by whom such tickets were used would purchase copies of the catalogue. He thought it was not altogether satisfactory that only eighty members had exhibited, and suggested that some preference should be given by the Committee of Selection to pictures sent in by members of the Society, subject to the maintenance of a certain standard of excellence.

The resolution was then put, and carried *nem. con.*

#### THE BALANCE-SHEET.

Mr. G. SCAMMELL (Hon. Treasurer) moved the adoption of the balance-sheet, upon which he made a few remarks. The Society started the year with a credit balance of 32*l.*, and finished with 138*l.* in hand, the liabilities remaining practically the same, 144*l.* as against 143*l.* The amount received as entrance fees and subscriptions was 898*l.*, the largest sum received under that head within his recollection. In 1890, when he was one of the Auditors, the item was 392*l.*, and the increase had gone on steadily from year to year. There was a slight decrease in exhibition receipts of 18*l.* 13*s.* 4*d.*, but there was, on the other side, a decrease in expenditure of 42*l.* 15*s.* 6*d.*, so that the net loss was only 10*l.* 19*s.* 2*d.*, as against 45*l.* 1*s.* 4*d.* in 1897. With regard to the Crystal Palace account, including the balance brought from 1897 (48*l.* 9*s.* 7*d.*), the account about balanced. There was a deficiency, but, owing to the action of Mr. F. Bishop, the amount required was subscribed by Messrs. Marion & Co., Dallmeyer, Ross, Beck, Swan, Wellington, and other exhibitors, to whom the Society was much indebted. The guarantee fund had already reached the sum asked for, and would see the Society safely through the first three years at the new premises in Russell-square, including furnishing. The expenditure had remained about the same as before. With regard to the Affiliation, there were now over eighty societies affiliated, representing some 6000 members, and, having regard to the work which was being done under the auspices of the scheme, the Council had decided to allocate to the purposes of the Affiliation two-thirds of the amount of the subscriptions received from the societies, instead of one-half as hitherto. Mr. Scammell added that the Affiliation scheme entailed considerable expense upon the Society, and that the suggestion which had been made, that it was run solely for the Society's benefit, was quite erroneous.

Mr. J. SPILLER seconded the motion, and congratulated the Treasurer upon having been able to make ends meet after a year of unusually ambitious enterprise.

The motion was then put and carried.

#### ELECTION OF OFFICERS AND COUNCIL.

Mr. T. SEBASTIAN DAVIS read the report of the Scrutineers, announcing the result of the election of officers and Council as follows:—*President*: The Rt. Hon. the Earl of Crawford, K.T., F.R.S.—*Vice-Presidents*: Captain W. de W. Abney, C.B., D.C.L., F.R.S., F.R.A.S.; Messrs. T. R. Dallmeyer, F.R.A.S.; Chapman Jones, F.I.C., F.C.S.; and Sir H. Trueman Wood, M.A.—*Hon. Treasurer*: Mr. George Scammell—*Ordinary Members of Council*: Messrs. R. Child Bayley, T. Bedding, T. Bolas, C. H. Bothamley, F. A. Bridge, A. Cowan, W. E. Debenham, A. Haddon, F. C. Lambert, A. Mackie, J. W. Marchant, J. A. Sinclair, J. Spiller, J. W. Swan, E. J. Wall, H. Snowden Ward, L. Warnerke, Colonel J. Waterhouse, J. B. B. Wellington, and H. Wilmer.

#### THANKS!

Mr. CLAPTON proposed a vote of thanks to the officers and Council for their valuable services to the Society during the past year, and the proposal, having been seconded by Mr. FRESHWATER, was carried by acclamation.

Similar compliments were paid to the Auditors and Scrutineers, and the proceedings then terminated.

#### PHOTOGRAPHIC CLUB.

FEBRUARY 8.—Mr. J. R. Williams in the chair.

A discussion took place as to the reason for a decided yellowing which had taken place in some bromide frontispiece illustrations in certain volumes which Mr. H. Vivian Hyde laid before the meeting. The point attracting particular attention was the fact that the yellowing only appeared to have occurred where certain printed matter came into contact with the print, that is, so far as a piece of tissue paper would allow of this, and the question arose as to whether the discolouring was consequent upon some faulty manipulation or whether it was attributable to the influence of the printed paper. The latter seemed the more reasonable explanation, seeing that, if it were one of process, the degradation of the print would be, or ought to be, genuine. Accepting the suggestion that the printer's ink was responsible, it was peculiar that no impression of the printed matter was discernible, its action, if any, being so general as to show upon the bromide print no trace of the whereabouts of the white interspaces.



The subject of gold toning and the average quantity of gold left in exhausted baths came up, and was discussed in a conversational manner for some time.

Mr. WELFORD thought that a greater amount of gold was recoverable from acetate or borax baths than from sulphocyanide baths, although there might be the same quantity present.

Mr. STRETTON stated that the commercial gold chloride was nothing like the home-made salt. He dissolved a nugget weighing 63.5 grains, and made up his toning solution. After three years' very frequent use he reduced the gold from the bath, and from the residue got back 32 grains of the pure metal.

Mr. HYDE inquired whether there was any means of discharging the yellow stain which frequently occurred when reducing lantern slides with ferricyanide?

It was thought that once a stain occurred it was almost an impossibility to free the plate of it. It was caused by the use of too strong a solution in the first instance, and, should washing be unduly deferred, the effect was much the same. There was some uncertainty as to which was the better way, in reducing negatives, slides, &c., namely, to apply the dilute ferricyanide to the plate as it emerged from the hypo fixing bath or to wash the plate and mix the ferricyanide with the hypo. It was recognised that the amount of hypo in a film taken direct from the fixing bath was a very uncertain quantity, and for this reason the balance of opinion was favourable to the alternative method.

**Brixton and Clapham Camera Club.**—February 7.—Mr. E. Dockree gave a lantern exhibition of miscellaneous slides—architectural, landscape, flower studies, &c.—which were well received. Mr. Mongiardino then tried acetylene as a lantern illuminant, which seems very suitable for small pictures. Tylar's new Aladdin lamp attracted attention.

**Croydon Camera Club.**—The Ninth Annual Meeting of the above, held on Wednesday, February 8, at the Club-rooms, 108, George-street, Croydon, disclosed a very flourishing state of affairs. The membership is now in the second century, and bids fair to complete the 200. The cash balance and assets amount to over 80%, liabilities none. Thirty-two evening meetings for demonstrations, &c., were held, at which the average attendance was twenty-four. Five important excursions were held, at which the average attendance was eighteen. A number of smaller outings were also organized. The report and balance-sheet having been adopted, the meeting appointed the following officers and councillors for the years 1899-1900. On the motion of Mr. JAMES PACKHAM (in the chair), seconded by Mr. JOHN SMITH, Mr. Hector Maclean, F.G.S., F.R.P.S., was unanimously re-elected President. *Vice-Presidents:* The Mayor of Croydon (Councillor G. J. Allen), the Right Hon. C. T. Ritchie, M.P., Sir David Salomons, Bart., Sir Frederick T. Edridge, and Mr. James Glaisher, F.R.S.—*Council:* Messrs. W. Burn, A. W. Hirst, A. C. W. Irving, A. E. Isaac, G. W. Jenkins, Councillor J. Noaks, J. Packham, F.R.P.S., J. Smith, J. C. Taylor, S. H. Wratten, G. W. Watson, and A. Willcocks.—*Hon. Treasurer:* Mr. H. E. Holland.—*Hon. Lanternist:* Mr. A. E. Isaac.—*Hon. Secretary:* Mr. W. H. Rogers, 108, Holmesdale-road, South Norwood, S.E.—*Hon. Assistant Secretary:* Mr. Atherton Aldis, 30 Surrey-street, Croydon. On the reappointment of Mr. Isaac to the post of Hon. Lanternist of the Club, the PRESIDENT, before putting the resolution, speaking on behalf of the whole Club, addressed a few words conveying the appreciation felt by all members at the great service which Mr. Isaac had rendered the Club. From the first day of its foundation he had worked on its committees, and had stuck to it through all its juvenile troubles. Of late years the Club had been free from its earlier anxieties, but without Mr. Isaac to give so much of his time to managing the lantern at their many lantern nights it would have been perhaps impossible for the Club to have established the long series of public lantern displays which have been so well appreciated. He (the speaker) had much pleasure in testifying to the invariably flattering terms in which all their many lecturers had always spoken of the effective and efficient way in which Mr. Isaac handled everything connected with the lantern. As a token of the members' esteem and gratitude the President then handed Mr. Isaac a handsome Tantalus spirit case, engraved with a suitable inscription, and bearing the recipient's monogram wrought in silver. The assemblage's hearty cheering on Mr. Isaac rising to acknowledge the presentation testified to the warmth of the members' esteem for the Hon. Lanternist. Subsequently the meeting decided to endorse the late Council's resolution to hold the Club's third public exhibition of photography in October of the present year. At the instance of Messrs. ROGERS and PACKHAM, the meeting further resolved to hold the Ninth Annual Dinner on Wednesday, February 22, and that a *Soirée* should also be given during the coming Exhibition.

**Kingston-on-Thames and District Photographic Society.**—February 6.—Mr. H. M. C. SPRUNT delivered a lecture, entitled

#### A CRUISE TO THE LAND OF THE MIDNIGHT SUN.

The chief difficulty in Norway, said the lecturer, from a photographer's point of view, is not so much to know what to take as to decide what not to photograph, so numerous are the pretty bits to be seen at every turn. In crossing the North Sea in summer there is little to be feared from the dreaded *mal de mer*. He had made the passage four times, and on only one occasion was it sufficiently rough to be unpleasant. The first port of call was Stavanger, the principal object of interest here being the cathedral, portions of which are said to resemble Winchester. Stavanger, like most Norwegian towns, is composed chiefly of wooden buildings, picturesque in appearance. Close to the town is a small lake covered with water lilies, and it was here the lecturer secured his first photograph on Norwegian soil, the operation being closely followed by a crowd of nearly one hundred girl and boy peasants. At Sundal many charming pictures of mountain and torrent were obtained, these eliciting considerable applause as they were projected upon the screen. The Boudhos glacier and waterfall were next visited. The glacier is an immense expanse of ice and snow, covering an area of twelve square miles, and, owing to the numerous ravines, dangerous to cross unaccompanied by a guide. The lecturer was fortunate in securing an excellent picture of the waterfall, showing the spray

from the falling water playing across the carriage way. Referring to railway travelling, he mentioned, incidentally, that a great contrast existed in comparison with British lines. There is no undue haste in the departure of a train, ample time being allowed for the selection of a seat; while, on the journey, the train is often delayed to satisfy the whim of some tourist passenger. As an instance, he cited a case wherein he and his camera played a prominent part. Travelling from Bergen he encountered a peasant bridal party, and, being desirous of including a Norwegian bride in his series of pictures, permission was obtained from the parties immediately concerned, and the photograph taken at the next station, where the train was purposely detained fifteen minutes. A Norwegian bride can usually be distinguished by her peculiar head-dress, resplendent with gold and silver ornaments. When the family can afford it, this head gear is retained, and handed down from mother to daughter, each succeeding generation adding further metallic embellishments. Numerous other slides depicting the various phases of Norwegian life, manners, and customs, Laplanders and their dogs, and the beauties of the country were passed through the lantern, concluding with a capital photograph of the midnight sun.

**Lewisham Camera Club.**—February 7.—Mr. H. L. DAVIS gave a practical demonstration on the

#### TRIMMING AND MOUNTING OF PRINTS.

For trimming small prints he used a shape cut from hard wood, with a rectangular opening to enable it to be correctly adjusted over the print, and preferred a hard wooden surface for cutting upon. Having trimmed several prints, he proceeded to mount them, using stiff starch paste, which was spread over the paper by means of a piece of sponge, thus obviating the possibility of a bristle getting between the print and mount. The advantage gained by using a sponge when dealing with large surfaces was obvious on seeing the ease and rapidity with which Mr. Davis spread the mountant over the back of an enlargement. He then proceeded to make a cut-out mount for this, and in a few minutes cut a perfect bevel-edged opening in a suitable board, using an ordinary penknife, and having as a guide a steel straight-edge, which, owing to its weight, did not require an assistant to keep it steady.

**North Middlesex Photographic Society.**—February 6, the President (Mr. Mummery) in the chair.—Mr. H. STUART (Hon. Secretary) explained, according to a promise at the last meeting, the function of a condenser in the optical lantern. He had prepared several diagrams, which illustrated very clearly what was required of the condenser. To get the maximum efficiency, the rays from the source of light must be brought to as small a compass as possible within the projecting lens, so that all the light collected by the condenser may be used. If the focus of the latter is too long, so that the cone of rays is brought to a focus beyond the lens, all the rays will not pass through unless the light is withdrawn further from the condenser, with consequent loss of light on the screen.

**Putney Photographic Society.**—February 6, Mr. Francis T. Beeson, F.R.P.S., in the chair.—Mr. EDMUND A. ROBINS, of the Eastman Company, gave a demonstration of the

#### DEVELOPMENT AND TONING OF SOLIO PAPER.

After giving an explanation of the process, the lecturer proceeded with the development of prints that had been only slightly printed, putting them, without previous washing, into the developer: Hydroquinone, 24 grains; citric acid, 60 grains; acetate soda, 1½ ounces; water, 30 ounces. These he developed up to about the same depth as when ordinarily printed, and, after a thorough washing, toned them by means of the sulphocyanide bath, and fixed as usual. The lecturer mentioned that, as an alternative, the combined toning and fixing bath could be used. Systematic toning of Solio paper was also demonstrated, by which any desired tone can be obtained by varying the amount of prints per grain of gold used for toning, thus a solution containing 1 grain of gold chloride to 10 grains of ammonium sulphocyanide will tone six half-plate prints to a purple-black, twenty prints to the same amount of gold giving a brown tone. After the demonstration samples of Dekko paper were handed round, this being a paper which may be exposed and developed in weak gas-light, hydroquinone and metal being recommended for development. Any colour, from red to purple, can be obtained by exposing until the detail is just visible and developing in the following solution, after thoroughly washing: No. 1. Citric acid, 2½ ounces; ammonium carbonate, 1 ounce; water, 10 ounces. No. 2. Sulphite of iron, 2½ ounces; water, 10 ounces; sulphuric acid, 10 drops. For use, add one part of No. 2 to three parts of No. 1, and not *vice versa*. The prints are thoroughly washed and fixed in the usual hypo bath.

**Derby Photographic Society.**—February 7, Annual Meeting.—After the transaction of the usual business, the VICE-PRESIDENT made some interesting remarks on the subject of

#### PICTORIAL PHOTOGRAPHY.

He expressed the hope that his year of office might see a distinct advance in the work of the Society, and that members would endeavour to rise above the old-fashioned photography which aimed at the representation of crowds of detail. Several years ago Emerson began to preach the value of what was now known as pictorial photography, as compared with the prevalent style of rendering too much detail, and that in sharp focus; but, for many years, he had been like one "crying in the wilderness," and his doctrines had not been adopted until recent years. Even now the old style found most favour with the general public, but it was for photographers to lead, and members of this Society should devote their attention to the pictorial work which alone was of value for exhibition and competition purposes at the present day. He urged members to show "evidence of intention" in their work, something to appeal beyond the eye to the higher faculties, and not to content themselves with mere views of pretty scenes, which were nothing beyond records and maps. Mr. Bland went on to call attention to the Exhibition which it is proposed to hold in the Art Gallery in June or July. He said that members of the Society would be expected to loyally support the Committee, who had the matter in hand, and justify the action of the Corporation in catering for them. If members did not do this, and the



Society did not make a good show, there would be very little prospect of the Corporation again bearing the expense of such an Exhibition. Subsequently Mr. Bland passed round a portfolio of beautiful photographs by some of the best workers belonging to one of the Postal Camera Clubs.

**Dundee and East of Scotland Photographic Association.**—February 3, Mr. W. H. Tittensor, jun. (Vice-President) in the chair.—Dr. LUMSDEN, of the University College, Dundee, delivered a lecture, entitled,

#### HOW LIGHT PRODUCES CHANGE.

The lecturer showed that there were three denominations of matter. Masses obeying the force of gravitation, molecules held together by cohesion, and atoms bound by chemical affinity. Molecules were clusters of atoms which could be separated and rearranged, and chemical change was simply a changing of partners. Experiments to illustrate change produced by heat, electricity, sound, and light were shown. The nature of light was next considered. All sources of light were places of intense motion, and the disturbance in the ether so caused was propagated to vast distances, and could produce a similar motion on a suitable receiver, such as the eye or a photographic plate. On a photographic plate there were groups of molecules suspended in gelatine. Light caused a vibration which overcame the chemical affinity; there was a rearrangement, and on the plate were now two substances instead of one. A developer was a solution sent to search for the altered particles, and to fix them. The action of various kinds of light in producing chemical change was shown to explain the difficulty experienced in producing an orthochromatic plate. The CHAIRMAN then referred to the loss the Association had sustained through the death of Mr. G. G. MacLaren, and submitted the following draft of minute, which was approved by the meeting: "The Dundee and East of Scotland Photographic Association, in expressing its sense of the loss it has sustained through the death of Mr. G. G. MacLaren, late senior Vice-President, desires to record the valuable services that Mr. MacLaren so frequently rendered to the Association. A regular attendant, both at its ordinary and its Council meetings, his suggestions and remarks were invariably practical and helpful. He ungrudgingly placed his professional experience and skill at the disposal of the Council, and it was largely through his interest that the club-rooms were instituted, and through his assistance that they were equipped. His colleagues will long remember his uniform and quiet courtesy, and recognise the good influence that he always brought with him to their meetings. The Association instructs the Secretary to enter this testimony to Mr. MacLaren's worth in the minutes of this meeting, and to convey to Mrs. MacLaren and her family, along with a copy of this resolution, an expression of the deep sympathy felt by every member for them in this bereavement."

#### FORTHCOMING EXHIBITIONS.

1899.			
February 17, 18	.....	Photographic Society of Ireland. Hon. Secretary, 35, Dawson-street, Dublin.	
" 17-23	.....	Northampton. E. J. Felse, 53, Adams-avenue, Northampton.	
" 17-25	.....	Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, 2, George-street, Edinburgh.	
" 18	.....	West London.	
" 21-24	.....	Hastings and St. Leonards. Exhibition Secretary, A. Brooker, 21A, Wellington-place, Hastings.	
" 23-25	.....	Woolwich Photographic Society. Hon. Secretary, F. W. Machen, 161, Griffin-road, Plumstead, S.E.	
" 27-March 4	.....	Birmingham. C. J. Fowler, Court Mount, Edington, near Birmingham.	
March 4-11	.....	South London. Hon. Secretary, A. E. Allen, 27, Princes-square, Kennington Cross, S.E.	
" 14, 15	.....	G.E.R. Mechanics' Institution (Photographic Section), Stratford, E. Hon. Secretary, H. W. C. Drury, St. Oswald's, Downs-road, Clapton, N.E.	
" 15, 16	.....	Brentford.	
" 20-May 13	.....	National Trades and Industrial Exhibition, Bingley Hall, Birmingham. Manager, Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.	

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### PRINTERS.

##### To the Editors.

GENTLEMEN,—Seeing your article in last week's BRITISH JOURNAL re fading of prints, may I trespass upon your space to say that I thoroughly endorse your remarks as to carelessness. I am a printer of sixteen years' experience, and have been for some years a head printer in a good firm, but, alas! it is only too true that boys and girls are left to do the work,

which should only be intrusted to a trustworthy and experienced man. I have had to give up many an hour of my own meal time, simply to stay and see that the washing of prints has been properly done, or I have proved that they are scamped over with one change, not about twenty minutes in a dish of running water, and a not over clean dish-either; I don't get faded prints now I see personally after the washing of them, and my experience tells me that this is the case in the majority of firms. Let them pay a good printer a living wage, and get a man they can trust.—I am, yours, &c., PERMANENT.

#### THE GLASGOW INTERNATIONAL EXHIBITION.

##### To the Editors.

GENTLEMEN,—I am directed by the Council of the Glasgow and West of Scotland Amateur Photographic Association to ask you to contradict the statement made in your last issue that the Association has decided to have nothing to do with the International Exhibition of 1901. The matter referred to has not even been discussed by the Association.—I am, yours, &c., WM. GOODWIN, Hon. Sec.  
3, Lynedoch-street, Glasgow, February 14, 1899.

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

#### PHOTOGRAPHS REGISTERED:—

H. W. PENFOLD, 100, High-street, Ashford, Kent.—Photograph of scene of Biddenden murder, February 5. Photograph of J. Whibley's house, Biddenden.

A. W. YALLOP, 198, High-street, Gorleston, near Great Yarmouth.—Three Photographs of Scotch fishing boats at sea. Photograph of rough sea on stone breakwater at Gorleston. Photograph of tug and schooner entering the harbour at Gorleston during a gale. Photograph of fishing vessel sailing into Gorleston Harbour in a rough sea.

PROVINCE; W. EDMUND WALLIS; H. PENFOLD; and others. In our next.

JOHN BOOL.—Thanks for your letter.

PHOTO-PHOENIX.—Approximately three grammes of zinc, and say half to one ounce of acid.

GILBERT STRINGER (Colchester).—Thanks; but the matter is hardly one of general interest.

PRINTER.—Add, slowly, a solution of sulphate of iron 1:4 (about) to the bath until no more gold is precipitated.

G. BANKART (Leicester).—Thanks for the suggestion. We will endeavour to meet your wishes at an early date.

E. BULLOCH.—We are much obliged to you for the report. You will see a reference to the matter in Ex Cathedra.

A. W. W.—Try King's solution for the purpose. It is sold by Marion & Co., and we have found it very effective for the purpose.

A. B. (Burton-on-Trent).—The nitrate of silver will do very well. Pure chloride of sodium will be better than common table salt for the emulsion.

C. A. WAITE, of 17, Clifton-street, Wolverhampton, inquires for the address of a photographic assistants' union. We know of no such body. Do any of our readers?

PAINTER.—We have not published any such article. In the case you cite if the business shows a clear net yearly profit of 50% or more, it might not be dear at the price.

W. D. J.—There is no book current on the subject that we know of. Bigelow's *Album* might be met with second-hand if advertised for. It treats of posing and lighting.

J. ROBINSON.—Possibly the incandescent electric light system would be the best. Messrs. Adamson supply the fittings, but we could not tell you where it could be seen in operation in your town.

SPOTS AND STAINS: W. & Co.; T. BAKER. See leading article in last week's issue. The marks on the latter's prints are obviously due to the prints being allowed to stick together while in the fixing solution.

PRINTER.—Your letter was unnecessarily offensive, and was consigned to our waste-paper basket. Do you not think you could discuss the pros and cons of a printing process without penning insulting remarks about one of our most skilful photographers?

VARNISH TROUBLE.—S. NEWTON. If the varnish does not dry, and behaves as you say, there is little doubt but that there is hyposulphite in the film, and a good deal too. The varnish we know to be good, so try more perfect washing of the plates.



**HENRY SHORT.**—Bromide and platinotype prints make very effective transparencies; but you must recollect that the action of light, of which you say there is plenty, on the paper, is a darkening one. Can you not fill the space with glass transparencies? Paper, we fear, would not last long enough to please you.

**SILVER INTENSIFICATION.**—**ALAN** says: "When intensifying gelatine negatives with mercury and cyanide of potassium with silver nitrate, may the cyanide silver bath be used more than once, or should a new bath be made each time?"—The same solution may be used over and over again. No need for a new solution each time.

**UNMOUNTING PRINTS.**—**WALLACE** asks how he can get some prints off their mounts that he knows were mounted with either gelatine or glue.—Soak the prints in cold water for an hour or two until they are perfectly saturated, then transfer them to warm water, about 100° Fahr. In a few minutes the prints can be easily stripped off.

**FOGGED PLATES.**—**T. BURKE.** The only way we can account for the fogging is that the light used, either in filling the slides or in the development of the plates, was not a safe one. We would suggest that you see to that. You may rely upon it that the plates were right, also that the developer, if compounded as stated, was quite right; so also was the method of using it.

**C. TYLER.**—Probably the process over which most command is obtainable is that of Mr. Chapman Jones. It is, briefly, to whiten the image with bichloride of mercury and redevelop with ferrous oxalate. If we remember aright, Mr. Chapman Jones, some years ago, showed that the intensity of a thin negative could be built up in this manner to an almost unlimited extent.

**AGREEMENT.**—**R. C. C.** It is a matter that we can hardly advise upon; but it seems to us that it would be unwise to take a place on only a three-years' agreement, and on the strength of that only to build a studio, &c., that will cost from 100% to 150%. The rent is low, it is true, but where will you, and the business you may have built up, be at the end of that term? Our advice is, insist on a longer term.

**GELATINE PAPER.**—**M. R.** inquires where he can obtain some paper with an enamelled or baryta coating which has been coated with plain thin gelatine, like the double transfer paper for carbon printing, but without chrome or other alum.—We do not know if such a paper is stocked by any one. The Autotype Company, or Elliott & Son, are the most likely people. If they do not stock it, they will probably make it to order.

**FAULTY BROMIDE PRINTS.**—**B. HIGGS** complains of the colour and hardness of his bromide prints. The prints enclosed show that they are all under-exposed, and have been much forced in the development. The green tint is to be accounted for in the use of too much bromide in the developer. A longer exposure and less forcing in the development will give more harmonious results and less chalky whites and buried shadows.

**ENAMELLING.**—**L. E. W.** says: "The enclosed enamels, you will observe, have dull marks on the surface, this occurs occasionally. Will you kindly tell me the cause, also how to avoid them in the future?"—Some of the marks are due to air being imprisoned between the print and the glass, when they are squeezed down upon it. Others, though fewer, are caused by solid particles such as dust adhering to the print, or in the water getting imprisoned.

**COPYRIGHT CASE.**—**F. SARGENT** says: "In your issue of December 23 you have entry of two photographs registered by me. They have since then been reproduced in two different newspapers without my consent. Can you advise me what to do in the matter?"—In reply: The case is very simple. Employ a solicitor to demand payment for the infringement—we would suggest ten guineas for each photograph. If the photographs were registered before the infringement, the newspapers, metaphorically speaking, have not a leg to stand on, and will be glad to compromise.

**SALE OF BUSINESS.**—**W.** says: "I have agreed to purchase a business, and have paid a deposit, but since doing so I have learnt that the business and the returns have been entirely misrepresented to me, indeed it is little, if any, less than a fraud. I certainly shall not complete the purchase. But can you tell me if I must sacrifice the deposit money I have paid?"—If the deposit has been obtained from you by fraudulent misrepresentation, you can certainly recover it back. We should advise you to place the matter in the hands of a solicitor. In reply to the second query, we know nothing of the party.

**CLEAR HYPO SOLUTION.**—**F. E. G.** says: "Will you kindly inform me what I should put into my fixing solution (hypo) to prevent it discolouring so quickly? I am using it for fixing bromide prints, and to keep the whites pure I like the hypo solution quite clear, but I find this requires three casks of hypo instead of one."—The best way of keeping the fixing bath clear is to wash the prints free from the developer before they are put into it. The "acid fixing bath" keeps clearer than the plain solution of hyposulphite of soda, but many object to its use on the score of the prints fixed in it being thought less permanent.

**COPYRIGHT.**—**CARBONETTE** says: "I have recently purchased a business, including stock in trade, goodwill, and negatives, and all apparatus appertaining to the photographic trade. Among the negatives is one of a county nobleman, now deceased, which is a copy of an enlargement made by myself, along with the assistance of my predecessor, from one of his own negatives. Can I copyright same, and prevent another party in the town from selling copies, as this party, by some means, copied the enlargement which is the work of my predecessor and myself. The original negative, you will understand, was taken by my predecessor?"—In reply: We think you are powerless in the matter unless a print from the original negative was registered and an assignment of copyright made to you by your predecessor. This is stating the law of the case, as we understand it, from the Copyright Act.

**BOOKS WANTED.**—**E. A. METCALFE** says: "Would you kindly inform me where I can purchase the following books—illustrated, if possible: 1, on lighting and posing; 2, working up in black-and-white; 3, retouching? Please state prices."—In reply: There is no work extant on posing and lighting. *Artistic Lighting*, by Inglic, published by the Photo-Beacon Company, Chicago, price, we think, one dollar, might suit you. As for the others, *Working up Enlargements* (Boal), published by Percy Lund & Co., and *Retouching* (by Johnson), published by Marion, might answer. We do not know the prices; you had better order the books through a dealer.

**WATER-GLASS.**—**H. B.** says: "I bought this substance in the form of a clear white treacle. When I use it as a varnish, it becomes milky and remains soft. Why is this? Ought I to subject it to heat? How can I make a solution of it? What is the proper solvent? Referring to p. 85 of last week's issue ('Fireproof Wood'), what is the effect of adding am. to water-glass under ordinary circumstances, i.e., without pressure and vacuum? I find great difficulty in getting any information about water-glass."—Both the silicate of soda and silicate of potash are known as water-glass, and they may be diluted with water. The only use we know of water-glass in photography is as a substratum on glass plates, as in the collotype process, mixed with albumen and generally beer. We have not heard of its being used as a photographic varnish. It is used for making wood, &c., fireproof, as in the paragraph referred to, and also for coating damp walls prior to papering them.

**AN ASSISTANT'S DILEMMA.**—**W.** says: "Some few months ago you were good enough to answer a query of mine as to the quality of some retouching I sent you. You then expressed the opinion that it was decidedly above the average. This was about April or May last year. I venture now to write you to ask whether you could advise me further in the following matter: I have been engaged in photography for the past seven and a half years, and, until April 1897, I did very well in the matter of engagements, but since then I have not done twelve months' work, having only had two season engagements. I have always been used to first-class work, and I really cannot understand how it is that I cannot obtain an engagement. Advertisements in your widely circulated paper bring no answers, and I really don't know beyond this how to obtain an engagement. I have written to many firms in addition. Are there many more in my position in the profession, I wonder? I hope not. If you could give me a hint or two, I should be greatly obliged."—In reply: We can only suggest personal applications to such firms as are likely to require the services of a good retoucher. But in these times retouching by itself is, in our opinion, barely sufficient to rely upon for a living; combined with first-class operating, printing, &c., it should enable a man to secure a good position. We are sorry we cannot be of more help in the matter.

**STUDIO, &c.**—**C. F. A.** says: "1. A friend of mine is erecting a studio which is to stand in open space with north-east aspect (see plan enclosed for measurements). He is anxious to know if it would be a great advantage to raise the ridge so as to give an angle that would keep the sun off at its highest altitude. 2. What angle would that require to be? 3. In working the bigum process by the old method of mixing the gum, pigment, and bichromate together, is it essential that the coating should be done in yellow or ruby light, or could it be done with lamp or gas light unscreened? 4. When making enlargements from a negative that is showing grain slightly, is it advisable to use a small stop, or should it be done with the longest stop compatible with definition? 5. What are the conditions for obtaining a copyright for a photograph, and to whom should I apply?"—1 and 2. We should prefer the studio shown in the first sketch, not the suggested alteration. A boarding a couple of feet high along the ridge would answer all the conditions of the "suggested improvement." 3. Yes. 4. The smaller the stop used the more pronounced will be the grain in the enlargement. When the grain is very coarse in the original, it is not unusual to make the enlargement with the lens a trifle out of focus, so as to hide it to an extent. 5. By registering it at Stationers' Hall. If you send us three copies with 1s. 7d. in stamps, we will effect the registration for you.

**MODERN FALLACIES, &c.**—**A. W.** writes as follows: "As one of the old workers, who you say are getting fewer and fewer (and I am, unfortunately, one of them) I read with great interest your recent leader on modern fallacies about old processes, because THE BRITISH JOURNAL OF PHOTOGRAPHY is the oldest journal, and always has been recognised as being authentically *au courant* with the old processes. When they are quoted, they should be quoted correctly, and not be misleading to historians in the future, and that is my reason for writing—more particularly with regard to the confusion of the sel-d'or with the old combined toning and fixing baths. In his letter on this subject in your issue of the 2nd ult., which I see you have not noticed, Mr. J. Pike further confuses the subject by saying, 'It is easy to see that from the simple solution to one containing phosphate of soda and an excess of hypo, with the object of combining the operations, was only one step. As a matter of fact, phosphate of soda was never used, either in connexion with the sel-d'or bath or the old combined toning and fixing bath. The former was hyposulphite of gold, and nothing else. The latter was simply a solution of hyposulphite of soda with chloride of gold added, no other salts, except, when this bath was first made, some added about double the quantity of nitrate of silver. This latter was always omitted when the bath was replenished; then only more hyposulphite of soda and chloride of gold was added. My reason for writing is, as one of the old hands, our methods of working should not be misrepresented. I might add that phosphate of soda in toning was only introduced after the alkaline system was adopted—the carbonate, acetate, citrate, borax, *et hoc genus omne*."



# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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## EX CATHEDRA.

LAST week, when reviewing a catalogue of cinematograph films (see page 108), we took the opportunity of throwing doubt on the wisdom or expediency of selecting sacred subjects for purposes of popular photographic illustration. Aside of the fact that photography obviously does not provide the ideal graphic agency for conveying to the world an individual conception of how the scenery and *dramatis personæ* of the Biblical drama really appeared and comported themselves, there is, as we pointed out, the risk of offending the finest, most cherished susceptibilities of vast numbers of persons by making the camera the means of depicting what are obviously life-model representations of incidents possessing, to such persons, the highest religious significance. We believe there is something very widely repugnant in the idea of persons posing before a lens in sacred character, and that, no matter how skilfully and reverently the photographs have been produced and treated, the incongruity and doubtful taste of nineteenth-century persons presuming to make up as actors or participators in dramatised portions of what so many millions of persons regard

as the Divine redemption of the human race, can never be obliterated from the minds of those called upon to contemplate the photographic results.

THE observations that we made a week ago have induced a correspondent to direct our attention to the February number of our highly esteemed contemporary, the *Photogram*, which contains three photographs purporting to represent the Crucifixion and the Entombment, by one of the most intellectual photographers yet produced by the United States—we mean Mr. F. Holland Day—whose pictorial work for the last two or three years has been favourably known on this side of the Atlantic. Mr. Day also writes a brief article called, "Sacred Art and the Camera," in which he pleads for the liberty of the photographer to illustrate subjects usually reserved for painters and draughtsmen. The titles of Mr. Day's photographs are: *Into Thy Hands, The Entombment, and I thirst*; and we mean no offence when we say that to us, as photographers, they are exceedingly repellent, in virtue of their obvious reliance upon "the art" of the person who made or built them up. The rutless lens reveals every little trick or artifice employed in "faking up" the originals; and we confess it is with something of a shock that we contemplate these photographically vamped-up representations of what are so generally regarded as three of the most moving incidents of the World's Tragedy figuring in the pages of an illustrated magazine.

To the best of our belief and knowledge, sacred art, so called, has not yet inspired British photography. At the moment we can only recall three pseudo-sacred photographs publicly exhibited, a *Christian Martyr* and two *Magdalenes*, and this in an experience of about twenty years of the exhibitions. Those attempts were coldly received by the photographic public, and we cannot discover that any inducement has been forthcoming to other photographers to select even graver themes than those mentioned for lenticular treatment. We hope matters will remain so. The lens and the dry plate do not idealise as the painter or the draughtsman can or may. The very finest skill of the foremost British photographers, we are convinced, would break down at any attempt to divest a sacred subject, taken by means of the camera, of those insistent and cartographical



details which impart an element of repulsiveness, in our eyes to Mr. Holland Day's photographs—repulsive because we are conscious that the individuality of the originals has not been, cannot be, so completely masked or subdued as to destroy the mental persuasion that we are looking at the image of a man made up to be photographed as the Christian Redeemer, and not at an artist's reverent and mental conception of a suffering Christ.

\* \* \*

WE hope that neither Mr. Holland Day nor anybody else will misunderstand our motive in drawing attention to this matter, as to which we believe we give expression to sentiments almost universally entertained by British photographers. Not only for the reasons given are sacred subjects best denied treatment by the camera, but also in the interests of photography and photographers themselves, who would surely provoke the hostile opinion of the educated public by any appreciable attempt to deflect camera work from its legitimate paths. A moment's reflection will show that the scope opened up by allowing that sacred subjects are admissible for photographic treatment is practically illimitable, and that the possibilities of offending against the deepest susceptibilities and convictions of millions of minds are just as great. We trust Mr. Holland Day's example will not find imitators in this country, and that in his own it will speedily be recognised that the reasons for denying to "sacred art" photographic treatment are so numerous and weighty, that a very serious responsibility is incurred in ignoring or overlooking them.

\* \* \*

WE are much obliged to Mr. Hugh Penfold, photographer, of 100, High-street, Ashford, Kent, for a photograph of somewhat sombre interest. Readers of the newspapers will recollect that three weeks ago a man named John Whibley was shot dead by the rector's daughter in the schoolroom at Biddenden, Kent. This is a photograph of the scene taken shortly after the deed. Whibley lies prone on his back, immediately under a picture of the Good Shepherd. What appears to be blood stains the floor near his head; his hat and stick are placed on a form, and, besides the simple little educational items of the country schoolroom, there is also shown, lying on the table, a small hand basket which presumably belonged to the unhappy woman who stands charged with the murder. The photograph tells its own tale, and has quite a grim fascination for one.

\* \* \*

WE are informed that Mr. John A. Tennant, for some years past Associate Editor of *Wilson's Photographic Magazine*, New York, has resigned that post and formed a partnership with Mr. W. E. Ward, late of the *Photogram*, London. Messrs. Tennant & Ward are located at 289, Fourth-avenue, New York, and will, in a few weeks, begin the publication of a monthly photographic magazine, the *Miniature*, which is, we learn, planned along new lines, and will not clash with the existing photographic journals. The new firm will make a speciality of dealing at wholesale and retail in American and foreign photographic books, and will also have the American agency for a London firm of general publishers.

\* \* \*

WE are indebted to the Société Anonyme des Arts Graphiques of Geneva (formerly known as F. Thévoz & Co.) for a very fine

specimen of three-colour work, employed in a branch of printing production for which that process is undoubtedly well adapted, namely, poster work. The actual measurements of the picture before us are  $22\frac{1}{2} \times 16\frac{1}{2}$  inches—a very good size of block, and for which, notwithstanding its dimensions, a by no means considerable "openness" of grain has been chosen. The design is a striking one, boldly executed, and it depicts the inevitable fancifully garbed and flower-decked female holding an engraving tool in her hand and placed in association with a camera. The symbolism is obvious. The block is a very fine one, and we are pleased to have it as a specimen of what can be done in three-colour poster work.

### COLOUR FALLACIES.

To the Chemical Section of last year's meeting of the American Association for the advancement of Science Mr. Romyn Hitchcock contributed a paper on "The Modern Problem of Photography." That problem is, of course, colour photography. We have the text of Mr. Hitchcock's paper before us in the January number of an American contemporary, *Wilson's Photographic Magazine*, and, as no subject is of such importance to photographers and others as the reproduction of the colours of art or nature by means of the camera, it may be useful if we examine the latest contribution towards the solution of that very fascinating problem, with a view to ascertaining how many steps nearer the desired end it has taken us.

To begin with, we must assume that the American Association occupies towards the world of science in America a position analogous to that filled in Great Britain by our own British Association. Hence the subjects brought to the notice of such a representative body derive an additional importance from the mere fact that they are laid before those who have an authoritative acquaintance with the branch of science which is dealt with by a particular section, and who may therefore reasonably be supposed to take precautions to ensure that the matter as well as the manner of the papers read is, as the current jargon expresses it, "class enough" for the meetings.

Now, the fact that Mr. Hitchcock's paper was accepted by, and read to, a body of scientific men, taken in conjunction with its subsequent publication in a photographic periodical, compels us to scrutinise his remarks with a little more care and closeness than we should devote to the outpourings of an irresponsible writer for the general press, whose knowledge of what photography in natural colours is, or is not, is usually conspicuously less than his ability to write fluently, but with fatal inaccuracy, on the ensnaring subject. Moreover, the fact that Mr. Hitchcock has put forward certain very original theoretical ideas of his own supplies an even more cogent reason for paying every attention to his remarks.

As the result of observation, Mr. Hitchcock says he is convinced of two fundamental facts, "which indicate that the fond dream of the photographer (i.e., colour photography) will sooner or later be realised." Straightway let us give Mr. Hitchcock's fundamental facts set forth in Mr. Hitchcock's own words.

"1. Under proper conditions, perhaps under all conditions, the various colours of an object may impress themselves upon a photographic plate, each in its specific manner, although the plate shows no colour to the eye. If a plate is developed into a negative, the specific effect is retained and fixed in the plate, which still shows no colour.



"2. A print from such a negative, either on glass or paper, is also specifically impressed by the colours of the original object. As a result of this, the following phenomena may (*sic*) be observed.

"(a) The positive may show the colours of the original object distinct and permanent.

"(b) The positive may not show any colour, but it may manifest a selective action in imbibing colouring matters from coloured solutions, whereby the colours of the original object can be experimentally determined, or more or less correctly reproduced." Mr. Hitchcock's two fundamental "facts," which he totally omits to fortify by the production of evidence, leads him to ask if it is not possible "that the colourless film of a photographic negative may possess a molecular constitution in different parts corresponding to the colours of the object."

We are much afraid that our author's "facts" are merely the idle speculation of one who possesses only a superficial acquaintance with colour photography in its theoretical aspects, which his question about the possibility of the molecular constitution of a negative corresponding to the colour of the object only serves to throw into high relief. The Hitchcock theory of colour photography is just the sort of thing we should expect a fairly clever amateur to put forward after a year's dabbling in photography; but Mr. Hitchcock lacks the excuse of inexperience for fathering the supposition that a miracle is likely to happen in the evolution of a colour-photography process. An ordinary film of sensitive silver haloid in gelatine, exposed and developed in the usual manner, is just as likely, either itself to register the colours of the original or to transmit them to a prepared printing surface, as the moon is to yield a supply of green cheese to Sir Thomas Lipton for his many shops, or the obese inhabitants of the farmyard pigsty are to take unto themselves wings and fly. Nothing in the chemistry or physics of the subject can be found to bolster up Mr. Hitchcock's jejune fallacy. The wave theory of light, which, after all, is the basis of the whole philosophy of colour, will not parallelise with Mr. Hitchcock's crude ideas at any point. Zenker, Wiener, and others have insisted upon the use of sensitive recording agents, compared with which ordinary gelatine films are hundreds of times too thick and opaque. Carey Lea, of Philadelphia, is, so far, the only scientist who has attempted to produce colour on ordinary bromide films, but that was by direct chemical agency. Mr. Hitchcock is probably unaware that the Lippmann results are produced on absolutely colourless, structureless, films in which the proportion of silver haloid is so small that it is not perceptible to the eye; but even these pictures are only visible in light of a certain incidence, the colours are subjective rather than objective. In short, Mr. Hitchcock's idea that an ordinary plate "may" register colour, and "may" transmit it, can at once be dismissed as totally absurd, unreasoning, and unscientific.

The mischief which such wild ideas as those which we are here exposing are likely to do among photographers of greater lack of knowledge than their author is intensified when they are illumined by the false glamour which attaches to the remaining parts of the paper, in which, *inter alia*, he suggests that there is probably at least a germ of truth in what has been claimed for the Chassagne process, viz., selective colour absorption. If Mr. Hitchcock had taken the trouble to acquaint himself with his subject, he would have known that the Chassagne process was utterly and finally discredited in Great

Britain more than eighteen months ago, and that not a soul in this country who knows anything of the subject now believes that it is anything but a simple and easily acquired process of colouring albumen prints by hand with aniline colours and a mordant. There are other erroneous passages in Mr. Hitchcock's paper, which we need not quote; but we have extracted more than enough from that unfortunate composition to show that the author can scarcely be accepted as a reliable guide on colour photography. Fancy a self-constituted authority on such a subject saying that "why one thing is blue, another red, is inexplicable!" What were the authorities of the American Association about when they accepted such a paper? And surely there are men in that body who would refuse to swallow Mr. Hitchcock's amazing dictum that, because a photographer observed colours on a developed transparency plate, therefore "this is nothing else than photography in colours." Breathes there the photographer with sight so dim who has not seen phenomena of the kind which he has been powerless to produce a second time? Before Mr. Hitchcock makes a further contribution to the literature of colour photography, we advise him to master an article on "Colour Photography" in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1899 by the Editor of that volume. He will find it of use in preventing the commission of blunders the like of which we hold it impossible to excuse in a man of his undoubted intelligence.

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**Chloride of Gold.**—As was seen by our report, last week, of the Photographic Club, complaint was made that the commercial chloride of gold was not so good as the home-made salt. That is frequently the case, but there is commercial chloride of gold and commercial chloride of gold. Some of the chloride in the market, if it contained the theoretical quantity of gold, would entail a considerable loss on its vendors. But there is chloride of gold in the market, each tube of which bears a label guaranteeing that it contains so many grains of the metal; these brands may be relied upon as containing that amount. But they necessarily cost more than the salt just referred to, though they are much cheaper in the end. One of the members at the Club meeting expressed the idea that more gold was recoverable from acetate and borax baths than from sulphocyanide baths, although there might be the same amount present. That, of course, is a fallacy, for whatever gold there is in a bath it may be recovered, quite regardless of the composition of the bath, if the proper means of doing so be taken. But it is obvious that, if all the gold has been used up in toning prints, there is none to be recovered from the exhausted solutions.

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**Separation of Mixtures of Chloride, Iodide, and Bromide of Silver.**—M. H. Baubigny, in a communication to the Paris Academy of Sciences, confirms his previous results in this direction—the employment of oxidising agents to detect the presence of bromine in the above mixture. The wet magma of the silver haloids is treated with nitric acid and crystals of permanganate of potassium. This transforms the iodide into iodate, and does not sensibly act on silver chloride, while the bromide is attacked very slightly. The merest trace of bromide vapour can be detected by fluoresceine paper, which is extremely sensitive to bromine.

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**Photographs of High-voltage Sparks through Air.**

—Those who are interested in the study of lightning-flash photographs will find in *Nature*, of February 9, some remarkable photographs of electric sparks from a battery of 10,000 elements, giving, approximately, 20,000 volts, and with a further modification giving a voltage of 3,000,000, the spark in air being from 6½ to 7 feet in length.



We have photographs of sparks exactly like lightning flashes and of one passing over the surface of water. Dry plates, in ordinary dark slides, held from 6 to 10 feet away from the terminal, are acted on, and developed with arborescent figures. One single spark, occupying an instant of time, passing through a Crookes' tube, will give a Röntgen-ray picture of a hand, but the tube is destroyed in the process.

**A Promised Revolution in Electric Lighting.**—We have on former occasions referred to the entirely new form of electric light invented by a young German scientist, Professor Nernst. Those who were fortunate enough to be present at a recent meeting of the Society of Arts had presented to them, by Mr. Swinburne, a masterly exposition of the theory of electric and other incandescent lighting, with practical illustrations of Professor Nernst's invention. At the conclusion of his remarks, Mr. Swinburne said: "It is difficult to discuss an invention like this without being carried away by enthusiasm. I feel, however, that I have but feebly shown forth the probable future of what seems to me the greatest invention in electric lighting that we have known for many years. Still, I am sure I have not been too sanguine." There is no doubt that the publicity and *clat* given to the invention by a lecture before the Society of Arts will so make it known that, if it possess anything like the merit claimed for it, we shall indeed see a revolution; and so simple is the new lamp that we may expect to see electric lighting in the studio the rule instead of the exception it now is. The simplicity of the whole thing is so striking that the chief wonder about it is that no one thought of it before. An infusible refractory earth is made into a rod, and being under ordinary conditions an insulator, electricity will not pass through it; by heating it with, for example, a lighted match or a spirit lamp, it at once becomes a conductor, and the resistance it offers to the current brings it to a state of brilliant incandescence, rivalling the electric arc and completely putting into the shade the ordinary incandescent carbon filament of the now common incandescent lamp. Already experimental lamps have been successfully worked for 500 hours, and it is anticipated that eventually the life of a lamp may be prolonged almost indefinitely. A familiar note was struck in the discussion by Mr. W. M. Moodey, who, in congratulating Professor Nernst upon his invention, said they must take care he had the credit of it, and "was not robbed by a number of people who would immediately be writing to the *Times* to say they had done the same thing in their back kitchen twenty years ago. This was what always took place in the case of a new invention." Photographic inventors know this to their cost; indeed, there could scarcely be named a business or profession making use of new inventions which so many inventors had been robbed of their ideas, which had laid the foundations of others' fortunes.

**Bequerel's Rays.**—In the *Revue Générale des Sciences* for the 30th ult. is a paper by Madame S. Curie upon her investigations upon the radiating body, supposed to be a new element, which she has separated, as before described by us, from pitchblende. Uranium and, largely, the new element, polonium, together with many other metals and their salts, emit, without being previously exposed to light, radiations possessing many properties in common with X rays. They pass through, virtually, all substances—glass, paper, metals, liquids. But their most remarkable property is their continuity of action without further apparent excitation. They thus in appearance seem to controvert the law of conservation of energy, and as the radiations emitted are capable of doing work, the problem of perpetual motion would appear to be actually solved, for no proof is offered that the actual substance of the emitting or radiating body suffers diminution of weight by emission of particles of its own substance. Finally, it may be noted that, while uranium, hitherto the most powerful radiating substance known, requires one hour's action to produce photographic effects, polonium needs only three minutes, though it is to be remembered that Madame Curie has extracted from polonium another substance whose photographic action is as much stronger than that of polonium as the latter's is stronger than uranium.

**Photography and Politics.**—It is said "they do things better in France." Perhaps they do, though that may be open to question in some matters. It is said that a packet of 5000 photographs of the Duke of Orleans has been seized on the French frontier. This reads somewhat strange to our English ideas, and we naturally feel some little curiosity to know upon what grounds such simple things as photographs of an individual have been seized. So far as we are aware, there is no law in this country that prohibits the importation of portraits of any person, whether he be an enemy of the State or not; but evidently, if the report be correct, the law is different across the Channel.

By the way, referring to France and its customs, the Paris correspondent of the *Standard*, telegraphing one day last week, says that considerable interest is being taken in art circles in a forthcoming sale of three pictures left in the hands of the French authorities as security for 91,000 francs. As considerable doubt existed as to their authors, experts have been called in to examine them, and they have come to the conclusion that one is the work of Claude Lorraine, the second by Greuze, while the third is signed on the back "A. V. D. Werf." If these pictures are genuine, as the experts say, the French authorities hold very good security for the money they advanced.

**Scientific Ballooning.**—In concluding a paper he read at a Society last week on "The Balloon as an Instrument of Scientific Research," the Rev. John M. Bacon expressed the opinion that, with properly designed spectroscopic and telescopic cameras, it was reasonable to hope that, at high elevations, they might penetrate with greater success than heretofore into the ultra-violet of the spectrum, and, even under conditions of diminished air glare, photograph the sun's corona without an eclipse. If that could be accomplished, it would be a great scientific achievement, and of great value. Solar eclipses are few and far between, and long and costly expeditions have to be made to make observations; but, if much that is then accomplished, supposing the weather proves favourable, can be done by a balloon journey of 20,000 or 30,000 feet in a balloon, it would be a great acquisition to science.

#### ON A SIMPLE METHOD OF DETERMINING THE FOCAL LENGTH OF A COMPOUND LENS.

In the course of some writing I am at present engaged upon I have had occasion to consider this question from "J. F. T.'s" very reasonable standpoint, and give below the simplest method I can think of "from the practical point of view of the working photographer." It does not necessitate special apparatus, although a true measure, and not an approximation, in its theoretical aspect.

1. Reverse the lens in its flange on the camera, and focus accurately upon a distant object (condition for parallel rays). Measure the distance from some definite point in the mounting of the lens, the hood, for instance, to the plane of the ground glass. (This gives the distance between the hood and the front "focal plane" of the compound lens.) Say it is nine inches.

2. Screw the lens in the flange in its ordinary position, and again focus accurately upon a distant object (parallel rays). Mark its position upon the baseboard of the camera. (The focussing screen now lies in the plane of the back focal point.)

3. Now proceed to focus accurately upon a near object placed at a distance of three or four times the (roughly estimated) focal length of the lens from the hood of the lens, say fifty-nine inches. The focussing screen will have to be racked out from its position for parallel rays (as in 2) a certain distance. Measure this; say it is two inches.

We know that the distance of the object is 59 inches, less 9 inches (as in 1), from the front focal plane of the compound lens, and that the image is 2 inches from the back focal plane.

$$\begin{aligned} \text{Hence } F^2 &= 50 \times 2 = 100; \\ \text{or the focal length} &= \sqrt{100} \\ &= 10 \text{ inches.} \end{aligned}$$

This method will be found to involve less labour, and is less liable to



error, than either of the methods given by "J. F. T." (I believe the credit of the second method he gives is due to Grubb.)

The knowledge of the true focal length of a lens alone is of little practical value to the photographer, but the knowledge of its focal length in conjunction with the distance of the front focal point or plane from some definite point of the lens itself will be extremely useful for accurate proportions in reduction or enlargement.

*Example.*—A reduction of four times is required with the lens in question. It is only necessary to place the object four times the focal length of the lens away from the front focal point or plane of the lens, or  $4 \times 10 + 9 = 49$  inches from the hood, when a certain reduction of four times is at once arrived at upon accurate focussing.

*Note.*—The positions of the focal points of a positive-lens system never alter. Once found, they are always known.

T. R. DALLMEYER, F.R.A.S.

### COLOUR-SENSITISING PLATES.

DR. G. EBERHARD, of Gotha, reports the results of his further researches on the use of the artificial colouring matters for sensitising plates in the current number of the *Photographische Correspondenz*.

Comparative exposures were made on an ordinary plate and one sensitised with Diazo black BHN, according to Valenta's formula. In most cases a preliminary ammonia bath was used, and the plates bathed for three minutes.

#### 1. SOCIÉTÉ CHIMIQUE DES USINES DU RHÔNE (GILLIARD, MONNET, & Co.).

*Noir de Lyon.*—None, or faint continuous sensitising; blue extremely strong.

*Cyclamin.*—This dye is, according to Schulze (*Tabellerische Uebersicht* No. 362), a fluoresceine derivative, and proved to be a very vigorous sensitiser, which might with advantage be used instead of rose Bengal or rose Bengal double, as the action reaches rather further into the orange. The silver precipitate is very vigorous. In a weak bath of dye 1:500 0.5 and water 100, there appeared a vigorous band  $C_3D-D_3F$ , with the maximum at  $D_3E$ . A minimum lay at  $Eb$ . Blue is more vigorous than orange-yellow and yellow. With greater concentration (water, 100; dye, 10; ammonia, 2; silver nitrate, 1:50 1), the band stretched from  $C_3D$  to  $E$ , falling slowly towards  $E$ . The maximum was at  $D$ , the orange yellow was stronger than blue, and the sensitiveness was good.

#### 2. JOH. CONR. REIHLEN IN FRIEDENSAU IN DER PFALZ.

*Nigrosin R wasserl.*† gives even with a weak bath (water, 100; 0.1 dye, 1:500), a narrow, vigorous band,  $C_3D$  to  $C_3D$ , and a weaker one  $D_3E-D_3E$ . With stronger concentration, the first band was more intense but not broad, and the second was weaker. The action extended from  $A$  right into the ultra-violet, and continuous from  $A-C$ . The blue was always very strong.

*Nigrosin R wasserl.*—The appearances are analogous to the above dye, but the second band ( $D-E$ ) is broad, and the action, with a weak bath and short exposure, extends to  $A$ . With strong bath, the regions  $A-a$  and  $B-C$  stood out as weak maxima in the continuous action.

*Nigrosin R and B spiritl.* were not tried.

#### 3. KINZLEBERGER & Co., IN PRAG.

*Alizarin gelb G*, weak action, falling quickly towards  $D$ .

*Glycinroth*, flat and weak band to  $C$ , with maximum  $D-D_3E$ .

*Glycinblau*, flat and weak band to  $B$ , with maximum at  $D$ .

*Glycinorinth* is a good sensitiser, which is important for practical work. It gives with very short exposure a continuous band to  $C$ , with longer to  $B$ ; slight maximum at  $Eb-Eb_3F$ . The region  $C-D$  is, with an exposure of half a second, as vigorous as a Diazoschwarz BHN plate with five seconds' exposure. The following formula is good:—

Water .....	100 parts.
Dye solution (1:500 in alcohol and water) ...	3-5 "
Ammonia .....	2 "

Herr Valenta has informed me privately that his experiments with this dye were unsuccessful, so further researches will be made.

#### 4. BINDSCHEDLER & Co., IN BASEL.

*Rhodamin 10 G*, a very vigorous band  $D-E$ , with maximum  $D_3E$ , and this would be of value were it not surpassed by erythrosine.

\* In all cases the names of the dyes are given as in the original paper to avoid possible errors in description.—TRANSLATOR.

† Wasserl. and spiritl. are abbreviations for wasserlöslich and spiritlöslich, or water and spirit soluble.

#### 5. GESELLSCHAFT FÜR CHEMISCHE INDUSTRIE, IN BASEL.

*Chitonblau B*, with great concentration and not too short an exposure, a vigorous band  $B-C_3D$ , and a very narrow weak band at  $D$ .

*Säureviolett 4 R*, with great concentration and long exposure a very faint band  $D-Eb$ , maximum  $D_3E$ .

*Säureviolett 7 B*, vigorous band  $C-C_3D$ , maximum  $C_3D$ , with long exposure; also a continuous action from  $B$  to  $E$ , with narrow and weak minimum about  $D$ , the principal band stood out very prominently. A strong bath is necessary.

*Karbidischwarz B* gives a band  $a-E$  falling towards  $E$ , maximum  $C-B$ ; acts weaker than Diazoschwarz BHN.

*Karbidischwarz BO* extraordinarily vigorous sensitiser. The best bath is

Water .....	100
Dye (1:500) .....	0.1
Ammonia .....	2

The band begins at  $A$ ,  $A-B$  weak, from  $B-E$  very strong, maximum  $C-B$ , slowly falling towards  $E$ . This dye acts about five times stronger than Diazoschwarz BHN, and it ought to be of great practical value, as the plates have good sensitiveness, are free from fog, and develop dense.

#### 6. SCHUCHARDT IN GÜRLITZ.

*Toluylenroth*, weak band  $C_3D-E$ , maximum  $D_3E$ .

*Toluylenblau*, a very difficult dye to use, as the least trace of alkali in the plate destroyed it. With a weak bath and silver nitrate a very narrow and weak band about  $a$ . The sensitiveness considerably lowered.

#### 7. K. OEHLEH IN OFFENBACH.

*Toluylen gelb*, *Toluylenorange G*, *Toluylenbraun OO*, *Toluylenbraun Q*. all give weak continuous action towards  $D$ .

*Toluylenorange R* and *Toluylenorange RR* give a weak band,  $D-E$ , the maximum of which is not very distinct, less about the middle.

*Toluylen schwarzblau B*, vigorous band,  $C-D$ , with long exposure beginning at  $B$ , also a weak band,  $D-E$ . The action is almost as good as Diazoschwarz.

*Toluylen schwarzblau B*, vigorous band,  $B-D$ , with long exposure beginning at  $a$ , and a weaker band from  $D$  to almost  $E$ . A good formula is:—

Water .....	100
Dye (1:500) .....	4
Ammonia .....	2

The action is better than Diazoschwarz.

*Neutoluylenblau B*, with strong concentration and moderately long exposure, a fairly strong band,  $B-C$ . With moderate concentration there appears a weaker band,  $C_3D-D$ . The dye does not act at all when weak.

*Naphtazurin R*, band,  $C-D$ , with long exposure,  $a-D$ .

*Naphtazurin BB*, very vigorous, band,  $a-D$ , with maximum,  $B-C$ , even with very short exposures. With longer exposure the action begins at  $A$ . A good formula is—

Water .....	100
Dye (1:500) .....	2
Ammonia .....	2

*Azochwarzblau B*, fairly vigorous band,  $B-D$ , falling quickly towards  $E$ .

*Azocorinth*, none or faint sensitising towards  $D$ .

*Azomaue B*, vigorous band from  $B$ ; maximum,  $C-C_3D$ ; minimum,  $D_3E-E$ . A good formula is:—

Water .....	100
Dye (1:500) .....	3-5
Ammonia .....	2

The action is stronger than Diazoschwarz.

### A PLEA FOR PYRO IN THE DEVELOPMENT OF LANTERN SLIDES.

WERE it possible to obtain the opinions of the great bulk of amateur workers regarding the most suitable developer to employ in the case of lantern slides, printed by means of any of the various brands of lantern plates now upon the market, it is just about ten to one that such would display a decided preponderance in favour of hydroquinone over all the other reducing agents which from time to time are advocated for this special class of work. No doubt the great popularity which hydroquinone has attained for this class of work lies in its cleanliness and freedom from any liability to stain the film, even after a fairly long time in development, and no doubt these two points are matters of considerable importance with amateur workers, who, on the other hand, look with



horror upon the idea of attempting to produce anything approaching such cleanly results with the aid of pyro and soda, or pyro and ammonia.

Here, in the West of Scotland, at least, for lantern-slide development, hydroquinone is very largely used; but there are, on the other hand, several of the more knowing ones who firmly pin their faith to pyro, and will not allow anything to tempt them from their first love.

During the last two seasons Glasgow has without doubt led the van in the matter of limelight lecturing, and first, with something like a series of thirty-six lectures, or one nightly over a period of six weeks, during the run of the 1897 Exhibition, when nearly every limelight lecturer of note in the United Kingdom was engaged at the Fine Art Institute, and which was followed, in 1898, by another full series of lectures under the auspices of the Messrs. Lizars. Glasgow photographers, both amateur and professional, may be said to have had more than usual facilities for judging of the various lecture sets that were put through the lantern during the run of these important functions, and it can be said that in Glasgow, where there are so many expert amateur slide-makers, a considerable amount of interest was shown in the various samples of slides that each lecturer used, as well as the further opportunity that was afforded the public of seeing the display of members' work furnished by our various local societies.

In the latter instance, the slides of one gentleman in particular stood out in a very marked manner from the great majority supplied by other workers, and, on minute investigation being made into the reason why such slides showed such a distinct superiority over the others, it was ascertained that not only the charming colour, but likewise the lovely range of tones, from high lights to transparent shadows, were produced by means of good old pyro and soda in some instances, with that of pyro and ammonia in others. That this should not have left its mark upon the workers of the West of Scotland would have been strange indeed, especially seeing so much rivalry exists in the matter of lantern-slide making, and so, during the last few months, in Glasgow at least, a decided reaction has set in in favour of pyro, the hardness and crudeness of hydroquinone-developed slides, with the, generally speaking, coldness of tone in the same, caused many to turn their attention towards producing the lovely black-brown so much admired in the case of the pyro slide.

There is no doubt that the one great stumbling-block in the use of pyro for lantern-slide development lies in the liability of staining the film, for all who use pyro for this purpose are not possessed of the knowledge requisite to use the same so that any discolouration should not take place, and some workers have been known to argue that to use pyro without a stain was impossible of accomplishment.

The fact, however, remains, that pyro can be so used, and is daily so, by myself and several others in the West of Scotland, made to produce slides absolutely free from any stain or discolouration. This use of pyro is easily accomplished by the exercise of a few well-recognised facts in this class of work. What these requirements are may be briefly stated as extreme cleanliness and a very carefully compounded formula in development.

In using pyro for this work, any one that has been accustomed to employ hydroquinone is very liable to fall into the error of trying to make a certain quantity of solution do duty for more than one slide, thereby using a solution that has become more or less oxidised before the same has been applied to the plate; therefore such workers ought, at the very outset, to discard all the routine applicable to hydroquinone, and use pyro as it will only allow of being used, viz., a new and fresh solution for each plate or batch of plates. In saying this much, however, it must be understood that the formula used in the development of lantern slides requires to be most carefully compounded. Doubtless there are several excellent formulae, both with soda and ammonia, now before the public, any of which, if carefully used, are capable of working cleanly enough; but in my practice I have never come across any formula to equal that which I believe was first recommended by Mr. J. Leisk, now over ten years ago, and I can, with the utmost confidence, recommend any ardent lantern-slide maker to adopt the same, with the utmost certainty of producing slides delightful in colour, range of tones, and absolute freedom from stain.

This developer is prepared as follows (and there must be no guess-work in doing it):—

First, a ten per cent. pyro stock solution is made up as under: Make a saturated solution of sulphite of soda in distilled water into each ounce of which 6 grains of citric acid have been previously dissolved; then to 9½ ounces of this saturated solution add 480 grains pyro (each 10 minims should then contain one grain).

Call the above A solution, or No. 1, or any other symbol, to show it is pyro. Then dissolve 4 ounces of carbonate of soda, 288 grains of pure sulphite of soda, 40 grains of bromide of ammonium, in 32 ounces of water.

Call this B, or soda solution, and, when going to develop, prepare the following clearing bath: Add two drachms of strong acetic acid to one pint of water. Pour one half of this into a basin, in which place a soft sponge or tuft of cotton-wool, and place the other half into a developing tray.

To develop, add from 20 to 60 drops or minims of pyro to each ounce of soda solution, and pour over the plate in the usual manner.

When the image appears, lift frequently out of the developer and examine for density, making allowance for a certain amount of loss in fixing. The image should be well seen at the back of the plate. When development is finished, sponge the slide gently, but rapidly, with the clearing bath in the basin, then place for a few minutes in the tray containing the other half of the acetic acid solution. Afterwards, well wash under the tap and fix in newly mixed and unused hypo.

It is claimed that, by working in the above manner, any one solution may be made to develop a number of plates in succession without yielding any stain, but such is not the result of my experience. Forcing in development is to be avoided, and the best way to prevent such is of course to give the utmost attention to a correct exposure that just meets this formula in development.

In using the pyro judgment must, of course, be exercised according to the nature of the subject to be developed, i.e., some subjects require more pyro than others; but, if this developer is carefully compounded and used as recommended by Mr. Leisk, there will be no staining the film, and slides will be produced which no hydroquinone formula ever could equal.

As compounded in separate solutions, the pyro and soda keep admirably, or without deterioration, for a considerable time.

It will be found that different makers' plates require varying quantities of pyro to gain density, but the old advice of sticking to one brand of plates will overcome any liability to get far wrong in the gaining of density, for it must be borne in mind that as much harm is done from over-density as from under.

I can confidently recommend the above method of lantern-slide development to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY.

T. N. ARMSTRONG.

#### THE LATEST COLOUR PHOTOGRAPHY PROCESS.

This is due to the International Colour Photo Company, of New Jersey, whose English agent thus describes it:—

In making my improvements in the art of producing coloured pictures by the aid of photography, I take paper, opaque white celluloid, or other similar material suitable for the purpose, and upon its face rule separate fine alternate lines of such dyes or colours as to correspond substantially with the fundamental colours of the spectrum, say, reddish-orange, yellowish-green, and violet-blue, in the order of the spectrum, or upon the face of which I place small alternate dots, squares, or figures in any manner sufficiently close to present to the eye a neutral surface. The colour of each dye is preferably of such depth as to absorb the kind of light transmitted by the others. More than three colours in the dots, or lines, or figures, may be used, such as the complementary colours, red and green, blue and yellow, or the whole series of the spectrum. Such a mixture of colours placed side by side follows the laws of the mixture of lights and not of pigments.

After the paper or similar material has been provided with its proper colours, as above explained, it may be covered with a coating of gelatine and with a sensitising material such as is used in sensitising the paper now used for photographic purposes, so that the lines, figures, or patterns of colours will be covered with the sensitising material. If desired, however, the paper may be first sensitised and the lines or patterns of colour or dyes afterwards applied. After being thus prepared, it forms what is ordinarily called printing paper adapted to be printed upon either through a negative, or by the use of metal or glass half-tone plate in a press with printer's ink. It is intended to be used where the negative is produced by the use of a transparent screen arranged in the camera before the sensitised surface of a dry plate, which screen, it will be understood, must, of course, be provided with lines, dots, squares, figures, or patterns corresponding to those on the printing paper, which causes the negative to be impressed with similar lines, figures, or patterns, and in printing from it the paper must first be placed upon it in such position that its lines, figures, and patterns register with similar lines, figures, and patterns on the negative.

For the purpose of printing on a mechanical press, I make a photographic screen, say, such a one as is ruled or printed in the alternated lines above, one hundred to the inch of each colour, or three hundred to the inch of all, one coloured line to transmit reddish-orange, the next yellowish-green, the next violet-blue, and so on in alternation; or, in other words, colours approximating to the recognised fundamental colours of the spectrum. The negative made in the use of this screen will be in lines, opaque where the coloured light has been transmitted and transparent where it has been absorbed. From this negative I make a metal or glass half-tone plate by any of the usual methods. This half-tone plate is divided on its surface by these manipulations in alternate raised lines, each corresponding to the amount of colour absorbed by the coloured lines of the screen or plate in the camera; or, in other words, to the non-action of light on the sensitised photographic plate, the depressions corresponding in width to the amount of light affecting the sensitised plate of the negative. A print taken from this half-tone plate upon white paper will show, with black ink, a lined black-and-white picture, or, where dots and figures are used, it will show a black-and-white picture corresponding to the pattern.



In order to print a coloured picture, I take a sheet of the printing paper, prepared as above described, containing the coloured lines, dots, figures, or patterns corresponding to the screen and negative, and to which the half-tone printing plate also corresponds in register, and print upon it, by means of the half-tone plate, a black or dark ink, making it register, so that the black ink will cover to its proper degree the colours which were absorbed in the camera by the coloured plate or screen, and leave uncovered or exposed those colours whose corresponding colours in the object to be photographed have impressed themselves on the negative in the camera. The blacks are formed by the black ink, the whites by the combination of the coloured lines, dots, or figures not covered by the ink, and the intermediate mixture of colours by the combination of such coloured lines, dots, figures, or patterns as are not entirely covered or obscured.

Fig. 1 represents the invention when embodied on a paper having parallel alternating different lines.

Fig. 2 represents the same when the paper is provided with alternating lines of coloured dots.

Fig. 3 represents the same when the paper is provided with the seven

Fig. 1.

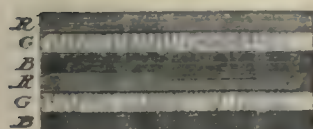


Fig. 2.

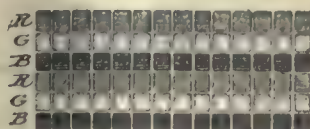


Fig. 3.

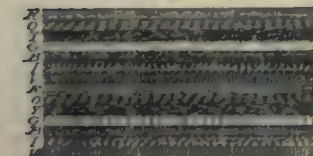
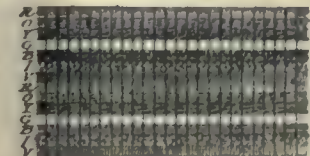


Fig. 4.



primary colours of the spectrum recurring in their regular order of sequence.

Fig. 4 represents the same as fig. 3, with the addition of the transverse black lines.

Fig. 5 represents the same when the paper is provided with alternating red and blue lines crossed transversely with yellow lines forming with the red, at the intersection, orange dots, or squares, and, with the blue, green dots or squares.

Fig. 6 represents the same as fig. 1, except that the lines are rounded in waving or curved order.

Fig. 7 represents the same when the paper is provided with a different

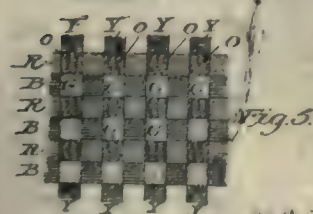


Fig. 5.

Fig. 6.



Fig. 8.

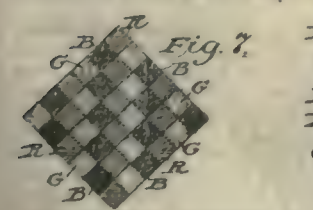


Fig. 7.

arrangement of dots or squares from that shown in fig. 2; and

Fig. 8 represents the same when the paper is provided with alternating zigzag lines of different colours.

The claims made for the process are:—

1. A white or light-coloured material, as paper, bearing a pattern symmetrical as to a plane in the primary or approximately primary colours used, and in such dyes or pigments as have suitable selective light-absorption properties.

2. A white or light-coloured material, as paper, provided with coloured substances arranged according to regular recurring patterns of such

colours as to cause each to absorb such colours as are transmitted by each and all the others.

3. A white or light-coloured material, as paper, provided with red, green, and blue-coloured substances arranged according to regular recurring patterns, symmetrical as to a plane, such colours being of such kinds and in such proportions as to present to the eye a white or neutral tint.

4. A white or light-coloured material, as paper, provided with red, green, and blue-coloured substances arranged according to regularly recurring patterns in regular recurring alternate order and symmetrical as to a plane, such colours being of such kinds and in such proportions as to present to the eye a white or light-coloured neutral tint, the patterns being covered with a photographic sensitive material.

5. A white or light-coloured material, as paper, provided with differently coloured substances corresponding to complementary colours of the spectrum, as red and green, blue and yellow, arranged according to regular recurring patterns, as dots, lines, figures, in regular recurring alternate order and symmetrical as to a plane, such colours being of such kinds and in such proportions as to present to the eye a white or light-coloured neutral tint, the patterns being covered with a photographic sensitive material.

6. The process of making coloured pictures, which consists in making a photographic negative in regular patterns, as dots, lines, figures, by the action of red, green, and blue-coloured lights upon the sensitive plate in such patterns, then making therefrom a corresponding half-tone plate, printing type or surface, then printing from such printing surface upon material prepared to correspond in colours and to register in form and dimensions with the patterns of coloured lights acting upon the negative and with the patterns upon the printing surface, whereby the colours corresponding to those that do not act upon the negative will be obscured or covered, while such proportion of coloured patterns as corresponds to the action of coloured lights upon the negative sensitised plate will be left visible.

7. The process of making coloured pictures, which consists in printing upon a material prepared to correspond in colours and register in form and dimensions with the patterns of red, green, and blue-coloured lights acting upon a negative, whereby the colours corresponding to those that do not act upon the negative will be obscured or covered, while such proportion of coloured patterns as corresponds to the action of the coloured lights upon the negative sensitised plate will be left visible.

8. The process of making coloured pictures, which consists in covering or obscuring by means of a positive picture the colours upon a material prepared to correspond in colour and to register in form and dimensions with the patterns of red, green, and blue-coloured lights acting upon a negative, whereby the colours corresponding to those that do not act upon the negative will be obscured or covered, while such proportion of the coloured patterns as corresponds to the action of coloured lights upon the negative sensitised plate will be left visible.

## RETOUCHING WITH A PIN.

It is the great ambition of photographic apprentices to be able to retouch, and in many establishments every encouragement is given.

Some make rapid progress, others fool away their time, and are as far forward at the end of their term as at the beginning. One bright youth, who was allowed an hour daily for practice, kept pegging away for months without progress. He was constantly bending over the retouching desk with no practical results.

Occasionally a march was stolen on him, and suspicion became very strong that, instead of working his pencil, he was indulging in numerous forty winks. He became so expert at napping while in an attitude of working, that ways and means were discussed to confirm or dispel the suspicion.

A happy thought came—to remove the pencil from the holder and substitute a piece of sharpened metal.

Time went on; for weeks that apprentice went through the formula of practising retouching, utterly oblivious of the change in pencil.

When at last his idleness was brought home to him, he stoutly maintained he had been retouching, and was not the sleeping beauty proved.

This event, of some years ago, recurred to my mind the other day, with the result that I took an ordinary pointed pin and tried to retouch with it. Strange to say, instead of scratching the film and ruining the negative, the marks were of a similar nature to those of an extra-hard, sharp-pointed lead pencil.

Subsequent trials have produced very satisfactory results.

The retouching can be done direct on the gelatine film, but is altered to an extent when varnished. So in practice it is preferable to varnish first and then retouch.

The pin works remarkably well on ordinary hard negative varnish. The pin pencil costs nothing, is always sharp, with a finer point than any other, especially valuable in softening deep, fine wrinkles. No medium is required, and it is absolutely free from grit.

By filing off the head of pin it can be pierced into a holder, and will prove a useful addition to the retoucher's pencils, if not a complete substitute.

THOMAS M. LAWS.



## A METHOD OF TONING WITH URANIUM.

VARIOUS salts of uranium in connexion with ferriocyanide of potassium (the red prussiate of potassa) act more or less as toners, says Mr. G. Gibson in the *American Journal of Photography*, but the persulphate of uranium gives the most satisfaction.

Make a ten per cent. solution of ferriocyanide of potassium; also a ten per cent. solution of persulphate of uranium.

For use, dilute with equal bulk of water for albumen prints, or four times as much water for aristo paper prints.

The mixture should be of a clear reddish-brown colour. The action is rather rapid, especially if the solution is used too strong, and it is best to start with a weak bath. The tones obtainable are brown, chocolate, purple brown, purple, and plain black if the action is carried on.

Too far toning gives unpleasant slaty black colours. There is scarcely any danger of stain or of double toning. When used too strong at first, the tone is liable to incline to foxy red. One peculiarity of this toning method is, it must be applied to fixed prints thoroughly washed.

After printing to the desired depth wash the prints as usual, fix (for aristos in weak hypo solution), then thoroughly wash. Insufficient washing will not cause stain, but the print will reduce in the subsequent toning and have a faded appearance. Toning unfixed prints with uranium did not give me any good results.

This toning solution is adaptable to transparencies and lantern slides, giving the same range of tones, but it should be used quite strong—almost the ten per cent. solution.

The tones on paper prints are pleasing; but whether lasting I cannot say, as I have only employed the method for little over a month.

## THE RESTORATION OF DAGUERRETYPES.

PROBABLY one of the most beautiful and, at the same time, most permanent of photographic processes, so far as the resulting pictures were concerned, was the old Daguerreotype. The process, however, was an expensive and a lengthy one, and, in consequence, had to give way to glass positives, which, in turn, were superseded by the modern pictures on paper, ivory, or porcelain. There are probably very few of the old workers of the Daguerreotype process left amongst us, but their works are still surviving. Scarcely a family among the upper and upper middle classes of society but possess one or more specimens of Daguerreotype, representing members of their family or dear friends who have in all probability long since passed to that bourne from which no traveller ever returns. These relics have in some cases been so carefully treasured and cared for that they are still as clear and bright as when first turned out from the producer's hand, while in other instances they have become dulled and indistinct owing to the oxidising influence of the atmosphere, which has been unwittingly allowed to act upon them, either from the hermetic sealing having been imperfectly executed or having become broken away, thus exposing the metallic plate to the full influence of the air. Photographers, both in this country and abroad, are constantly being asked to restore these faded relics, and but very few either attempt or, if the truth be told, know how to do so.

The Daguerreotype is a very delicate thing to handle; but, if care be taken, it is not a difficult matter to restore a merely faded one to the whole of its pristine beauty and clearness. When I say merely faded, I mean that the plate has not been in any way interfered with by unskilled hands, for, if such has been the case, if, say, some one has taken off the protecting glass, and rubbed the picture even with a silk handkerchief, the difficulty of restoration is not only increased, but very likely restoration rendered an impossibility. The picture is, in point of fact, a most delicate film on the surface of the silver, and, being unvarnished, is susceptible of injury from any rubbing or abrasion, however gently it may be done. Again, the picture may have already been in the hands of some other restorer (?), who may have attempted the work by some method other than the correct one, and may consequently have left some trace of a chemical behind that would impede or totally destroy any chance of genuine restoration. The first thing to do before undertaking an order is to ascertain that you are the first person into whose hands the work of restoration has been given, then to take off the glass and examine that the film be unbroken by scratches. If such be the case, the work may be undertaken with confidence, and is proceeded with in the following manner: Immerse the plate in a one per cent. solution of cyanide of potassium in distilled water, and carefully rock the dish until the milky or smoky appearance caused by oxidation disappears. If the strength of the cyanide does not have the desired effect, it may be increased, but care must be taken to use pure distilled water, and to touch the film with nothing whatever; even cotton-wool would cause scratches. So soon as the oxidation is removed, wash well in several changes of water, still noting that ordinary tap or rain water will not do; it must be distilled, if the work is to be properly executed.

When washed, dry by gentle heat in an atmosphere as free from dust as possible, as any dust settling on the picture cannot be brushed off without serious risk or damage. When dry, you will be able to see

whether anything further is required; in nine cases out of ten it will be found that the picture is already to all intents and purposes restored, although in the tenth it will be found that it is still lacking in detail and brilliance. In such a case redeveloping has to be resorted to; this process requires very careful manipulation, but can be successfully carried out by any one possessing a fuming box such as used for fuming albumenised paper. This, I may mention, is a box standing at least three feet from the ground, and nearly as air-tight as possible. On the bottom of the box place a small spirit lamp, and over the lamp a small saucer of mercury (the metal not bichloride). Affix the Daguerreotype face downwards to the lid of the box and close up for two minutes; then examine the plate and continue to do so at intervals of about a minute until all detail is up. Then remove the plate, put out the lamp, and close up your fuming box. During this operation the greatest care should be taken that none of the fumes of mercury be inhaled, as they are most poisonous. Lay a piece of clear, clean glass, plate if possible on the Daguerreotype and bind the edges with silk, using a plentiful supply of Canada balsam to stick the silk and keep the Daguerreotype from air.

The process of redeveloping, I must repeat, requires the greatest care in manipulation owing to the extremely poisonous nature of the fumes, and should never be resorted to by any one when the cyanide process brings up the image sufficiently. C. BRANWIN BARNES.

## TONING AND MODIFYING PRINTS AFTER DEVELOPMENT.

At the Photographic Club, on February 15 (Beginners' Night), Mr. Thomas Bedding in the chair, Mr. W. Ethelbert Henry gave a lecture upon the above subject.

He supposed that all beginners at some time or other had trouble with their prints, and it was the usual thing that defective prints, such as he passed round, were consigned to the waste receptacle. It was with a wish to avoid this waste that he proposed to demonstrate a few practical expedients for improving in one way or another the unsatisfactory results which even an established man is liable to produce; and, although these expedients did not claim to be new, the fact that they were not largely employed was sufficient in his opinion to warrant his bringing them again into notice.

It very often occurs that, in attempting to secure a decent red tone by direct development, one succeeds in making a print of a nasty brownish colour. There are formulae published which claim to give the desired tone, but, in the case of the print to be operated upon, this end was sought by increasing the exposure and by certain modifications of the development. Much might be done by way of improving this brown print by toning with gold and sulphocyanide and a black or purplish black colour substituted for the undesirable tint. The following bath is recommended:—

Ammonium sulphocyanide .....	20 grains.
Gold chloride .....	1 grain.
Water .....	2 ounces.

Before applying this to the print the latter should be damped. The action is rapid, three or four seconds sufficing to carry the tone verging on blue. The print should be washed for some fifteen or twenty minutes.

In the case of a print of a cold tone by direct development, to which we wish to impart a warm brown colour, the following course may be followed: The print is bleached in mercuric chloride 120 grains to 8 ounces of water, to which are added 2 drachms of hydrochloric acid. This solution is applied to the damp print, and the action, which is very quick, may be stopped by immersing in water and washing thoroughly. The bleached print is then blackened in a one per cent. solution of hyposulphite of soda, which gives rich brown blacks tending to sepia according to time of immersion.

Mr. Henry then showed another type of print of common occurrence, one showing a very heavy appearance, due to over-exposure and over-development. Supposing that we belong not to the class who look upon such things as excellent pictorial results, we, doubtless, wish to reduce the density, and not only on the high lights, but as a whole. Such a print would well be negotiated by subjecting it first to a one per cent. solution of persulphate of ammonium. The effect of this treatment is to attack the heavy deposit of silver, and, when this is judged to have proceeded sufficiently far, the print is rinsed and immersed in a second bath compounded as follows: A saturated solution of iodine in alcohol, and a saturated solution of potassium cyanide in water are required. A few drops of the first are taken, and, to this a few drops of the cyanide are added, in excess, until the discolouration is dispersed. Diluting the mixture, we complete the reduction of the print. The double process constitutes to a great extent a selective reducing action. An over-exposed and over-developed photograph of the moon was next treated. Contrast was wanting, and in this case the print was reduced generally by the iodine and cyanide formula, very weak, and, to make up for the deficiency of deposit in the shadows, toned in gold and sulphocyanide, the resulting colour being very appropriate, and the print of a much richer appearance.



The following formula was given as a means of imparting to prints a blue tone:—

Ammonio-citrate of iron (ten per cent.) .....	5 parts.
Potassium ferricyanide (ten per cent.) .....	5 "
Nitric acid (ten per cent.) .....	10 "
Water .....	100 "

After a few moments a pleasing black tone results, but continued immersion gives to the print a decidedly blue tone. This may be intensified by treatment with a solution of cyanide of potassium (1 in 5000), which also clears the whites and brightens up the whole image. Simple washing of the print, however, will effect this purpose. The method is particularly applicable to transparencies and lantern slides, and a specimen of the kind was shown.

Pleasing red tones were to be obtained by the use of a formula composed of the following salts in ten per cent. solutions:—

A.	
Water .....	20 parts.
Copper sulphate .....	1 part.
Ammonium carbonate .....	(about) 8 parts.

A thick precipitate is formed on mixing the ingredients, which redissolve on adding sufficient of the carbonate, leaving a clear solution. In another vessel are mixed—

B.	
Potassium ferricyanide (ten per cent.) .....	25 parts.
Water .....	150 "

The copper solution is then added to the contents of the second vessel, and a turbid solution results, which will render a fine red colour in a short space of time.

It frequently occurs that vignettied bromide prints are far from satisfactory, the vignetting being abrupt and harsh. An improved appearance may be given by treatment in the following manner: After damping the print and removing the surface liquid, a strong solution of the iodine and cyanide bath described above is applied with a piece of cotton-wool, the print being supported on a sheet of glass, and the parts which are not required gently gone over with the solution. Having cleared away superfluous deposit at the edges, the vignetting is softened down by holding the print under a tap, and while the water plays upon the centre dabbing the parts with the strong solution. To remove any possible fog on the print, the strong solution remaining may be diluted, and the whole of the print immersed for a few seconds. In the event of a flat dense print being under treatment, the general density will be reduced, and pluck may be given by toning with gold as described. A print which, at first, was very far from satisfactory was handled in the above manner, and the improved appearance was very marked.

The above are a few practical dodges which may often serve good purpose; but, as Mr. Henry said, they in no way exhaust the list. For the most part, waste Velox prints were those used to demonstrate upon, with a few ordinary bromide prints thrown in.

#### STALE PLATES IN LANTERN-SLIDE MAKING.

In the production of lantern slides by means of gelatino-chloride plates there is no doubt old or stale plates never produce such bright, sparkling results as are obtainable by means of newly coated samples.

Among amateur workers especially there is a strong chance when purchasing an odd box or two of any well-known brand, that what is acquired may have lain upon the dealer's shelves for a considerable length of time, there being no data placed upon the boxes or labels whereby any one can ascertain the date of coating such plates, the public cannot be guided as to whether such are stale or fresh.

As a rule, one of the first indications of a plate having been coated for a considerable length of time is observed when the development stage is reached, for around the edges of the plate there will be apparent a decided lack of lustre, verging almost to a discolouration, from the presence of chemical fog, and a distinct appearance of insensitiveness around the sides of the plate.

Plates stored in unsuitable positions in a dealer's store do not take long to reach such a stage of deterioration, and in winter time, when a low temperature is prevalent in the developing room, it is next to impossible to develop such plates without the results showing a very marked degree of opalescence in those parts that ought to show up as absolutely clear glass.

In such subjects as black-and-white objects this becomes a serious matter, for it is most annoying to produce these opalescent results, and, although the better course to follow is undoubtedly to discard all such stale plates, still at times fresh plates are not at hand, and the best must just be done with what are available. It is well known that the application of a coating of suitable varnish is in some cases a ready means of getting rid of this opalescent appearance, and conferring a bright and sparkling appearance to such a result. But then, again, many workers have a distinct objection to the application of varnish to their slides, by

reason of the almost certainty of introducing a crop of slug markings and other undesirable eyesores, which otherwise would never put in an appearance.

The fact is, the varnishing of lantern slides is a more delicate operation than many amateurs imagine or care to undertake, although in reality an operation quite successfully performed when any one makes a practice of doing such under proper conditions, such as not over-heating the plate, and studiously warring against that arch enemy dust.

There is, however, luckily, another very easy method whereby such an opalescent appearance can be removed without having recourse to the messy operation of varnishing, and this treatment is so exceedingly simple that any one can resort to it with the greatest ease.

When a lantern slide, after being fixed and washed, shows this undesirable appearance, let the same be immersed for a second or two in lukewarm water, and it will be found that the opalescence will disappear as if by magic, and not afterwards put in an appearance when the slide is finally dried.

One of the earliest formulæ for the development of some special make of lantern plates was that of pyro and ammonia used in conjunction with bromide of ammonium as a restrainer, and there is no doubt that, properly used on fresh plates, this developer is capable of yielding the most lovely slides imaginable; but, whenever a plate is being treated that has passed into the stale stage, it is almost next to impossible to obtain any result other than such containing chemical fog, which, in lantern slides, ought never to appear. This fog, very probably, may also show as a metallic deposit on the surface of the plate, and the moment it begins to appear so soon does all detail cease to develop up further, and in negative work this is bad enough, but in a lantern slide it becomes absolutely destructive. Such plates may be caused to yield better results by discarding pyro and ammonia for one or other of the developers, such as pyro and soda, or any good hydroquinone formula; but such can never be made to yield such bright and sparkling results as a freshly coated plate.

It cannot be said, however, that the dealers are responsible wholly for the supplying of stale plates. Amateurs themselves have a bad trick of keeping a stock of plates beside them for an indefinite period, and such are not long in suffering deterioration if stood in any damp or unsuitable place.

A. T. NEWTON.

#### AT THE CAMERA CLUB.

MANY very interesting lectures have been given at the Camera Club during the past week or two; but, as the subjects have not been of a photographic character, we have been unable to give them the attention they would otherwise deserve. The energetic Hon. Secretary, Mr. Godfrey, must at least be congratulated upon the varied fare which he has been enabled to place before the members, and by the large attendances secured it is evident that he works in a direction which is approved.

Perhaps the most technical of the recent papers was that by the Earl of Rosse on the heat of the moon, which, of course, gave an opening for the exhibition of photographs, those dealing with the varied phases of an eclipse being especially interesting. It has possibly not occurred to ordinary mortals that the moon has any heat, and although the poets of all times have been fond of describing her pallid beams, they have been silent on the question of heat. Perhaps we should except the poetical incident with regard to Endymion, when chaste Luna certainly did exhibit some amount of warmth. But Lord Rosse made no allusion to that pretty story, but contented himself with dry facts. By means of a powerful reflecting telescope, with smaller condensing mirrors to throw the rays upon a thermopile it has been found possible to ascertain that the moon gives off a perceptible amount of heat. When an eclipse occurs, back goes the needle of the galvanometer, and, strange to say, it does not recover its former position for hours after the moon regains its brilliancy. This was the most noticeable feature of Lord Rosse's paper, and one for which there is at present no satisfactory explanation.

A discourse of a very different character was that delivered on the 16th inst. by Dr. Gray, who has had the unique experience of living for a long time at Kabul, under the immediate protective friendship of the Ameer of Afghanistan. Dr. Gray carried a camera with him and was thus able to illustrate his remarks with plenty of interesting pictures, and, as he had ventured into regions where no camera had been carried before his photographs were the more valuable. Those familiar with the past history of our dealings with Afghanistan were glad enough to see actual photographs of such places as the Kyber Pass, the Fort of Ali Musjid, Jellalabad, &c., and a glance at them, with the terrible events they recalled, enabled one to understand the name given to their inhospitable country by the natives—"The land of stones and blood."

Dr. Gray made his way to Afghanistan by invitation of the Ameer. As a matter of fact, no one can get to Kabul except under that condition, and the approaches are so difficult that the regulation is not easy to circumvent. On his road thither he went *via* Peshawur, and met a guard of horsemen sent by the Ameer to escort him to Kabul. Many pictures of the rocky Kyber Pass showed the barrenness of the land through which the traveller went, and one or two of these pictures



showed the nature of the so-called villages—in reality forts with towers at their corners. From Jellalabad to Kabul was a continual ascent, through rocky gorges and pebbly valleys.

At one point the traveller saw in the distance what he took to be a flagstaff, but it turned out to be a high post with an iron cage at the top, which had a gloomy history. It seems that at one time highway robbery was common on this road, but at last one of the men was caught red-handed, and his punishment consisted in being shut up in this cage to die of starvation. This very thorough method of dealing with the offender had the effect of stopping robberies completely on that particular road.

A view of Kabul, with its 60,000 inhabitants, and of the Lahore Gate, through which the traveller entered it, brought Dr. Gray to the beginning of his exciting experiences at the court of the Ameer.

When Dr. Gray arrived, the Ameer was absent in Turkestan, and the Doctor was received by one of the princes, and welcomed to the country. But the interview was cut short by the occurrence of an earthquake, which the superstitious prince regarded as a sign of Almighty displeasure.

Many photographs were shown of the inhabitants, and it was noteworthy that the peasants carried a curious spade with a bar above the blade to accommodate the naked foot in the act of digging. At court, a semi-military European dress was commonly worn, the Ameer priding himself on adopting western customs, and looking upon himself as a most advanced monarch in that respect. Dr. Gray found that the art of medicine in Kabul was in a most primitive state, and much suffering and fatal results were brought about by the ignorance of the native doctors. By adopting European methods and remedies he quickly checked the high death rate which had previously prevailed, and, when the Ameer saw that the English mode of treatment produced good results on inferior beings, he condescended to intrust his own sacred person to Dr. Gray's good offices.

Upon examination the Ameer was found to have a complication of diseases, the most aggressive of which was gout. His state was not improved by the native remedies—chiefly bleeding, and, putting the feet into ice-cold water. However, under sensible treatment, he quickly recovered, and showed many signs of gratitude to his new doctor.

Dr. Gray's entertaining reminiscences were interspersed with little humorous touches which were much appreciated by the large audience which had assembled to listen to his most interesting lecture.

#### PHOTOGRAPHING OLD LONDON.

UNDER the Chairmanship of Sir J. Benjamin Stone, M.P., who, as President of the National Photographic Record Association, has already done great public service by securing for preservation at the British Museum so many photographs of present and future historical interest, a meeting was held on Tuesday last, February 21, for the purpose of discussing the possibilities and best methods of securing photographic records of ancient and decaying buildings in and around London. Among those present were Mr. B. L. Cohen, M.P., Sir H. Trueman Wood, Messrs. George Scamell, and J. W. Marchant, Dr. H. R. Mill, Mr. George Ashbee, Colonel J. Waterhouse, Mr. Thomas Bedding, F.R.P.S., Mr. B. E. Lawrence, Mr. Frank Haes, Mr. W. B. Stretton, Mr. W. A. J. Heneler, Mr. A. Kemp, and many representatives of antiquarian, archaeological, architectural, and photographic societies.

In a brief introductory address the Chairman pointed out that the work which amateur and professional photographers were willing to undertake in securing photographs of old buildings was very frequently useless without antiquarian assistance, and he thought that archaeologists and antiquarians might therefore be of very great help to photographers in scheduling and particularising the interesting places that should be photographed. Having referred to the success which was attending the Warwickshire Photographic Survey scheme, due to the systematic subdivision of the work, Sir Benjamin considered that London might be treated in a somewhat similar manner. The various archaeological societies might combine and prepare a list of the photographs to be taken. At the same time a small fund might be collected for purchasing photographs, or prints from the negatives, in the hands of professionals, who could hardly be expected to part with them for nothing. He also said that individual photographers might be of great assistance in the scheme by contributing photographs of old or disappearing parts of London, and concluded by pointing out that, as many of the old London landmarks were rapidly disappearing and constant changes were going on in the metropolis, there was an urgent necessity for securing photographic records of them without delay.

In the informal discussion that followed Sir Benjamin's address several suggestions were made. One was to the effect that the manner in which archaeological surveys of counties were conducted afforded a guide to the way in which a photographic survey of old London could be carried out. Dr. H. R. Mill emphasised the necessity of photographing old buildings before they were taken down, and new buildings as they were put up. Mr. George Ashbee (representing the Survey of Greater London) said there was a great deal of overlapping amongst the various societies doing survey work. He suggested that an exchange of prints might take place between them to their mutual advantage.

After other remarks from gentlemen representing the City of London and the City of Westminster, who said that the authorities of those places would be happy to co-operate with those anxious to secure photographic records of objects of historical interest, it was agreed, on the motion of the Chairman, that a committee should be appointed to carry out the objects of the meeting and settle details of procedure. This having been agreed to, a vote of thanks was passed to the Chairman on the proposition of Sir H. Trueman Wood.

#### EXHIBITION OF THE WEST LONDON PHOTOGRAPHIC SOCIETY.

THE West London Photographic Society held its Tenth Annual Exhibition of members' work on Friday and Saturday, the 17th and 18th inst., at the Broadway Lecture Hall, Hammersmith, W.

The Exhibition of this Society is always well worth a visit on account of the sterling good quality of the work that is to be found there. The hall, which forms the gallery, is not an ideal one for a picture exhibition, and very little seems to have been done to overcome its natural defects by even simple methods of decoration. The hanging of the pictures, at any rate, in the present case, has been performed in a way that would hardly commend itself to the new school of critics in exhibition management; but, in spite of these minor shortcomings, any of the exhibitions in recent years would have afforded a pleasant hour's recreation to any one content to study the pictures themselves, without regard to their surroundings. We must say, however, that in some matters of detail the arrangements have been improved, much to the comfort of visitors. The lighting in the evening was much better, indeed beyond reproach, and the system was adopted of hanging each exhibitor's works together, and the pictures were plainly labelled with the title and author.

We cannot say that we noticed any very marked improvement in the quality of the work over last year's. The average is perhaps better, but the prominent members of the Society have long since passed the stage when their work improves by leaps and bounds. Harry Selby, Leslie Selby, G. Lamley, A. E. Cockerell, M. W. Cockerell, and G. F. Blackmore fully maintain the reputation they have earned, and, with such leaders to work under, the junior members of the Society should have no difficulty in coping with the ordinary troubles of beginners, both in the technical and pictorial sides of photography. Mr. Blackmore showed, we think, the only examples of "gum-bichromate," but they were not an unqualified success. Mr. W. Collith, who has not exhibited before, struck the most original note in the Exhibition. His choice of subjects showed an appreciation of what is requisite to make a picture; but it was in his technique that he scored. His prints appeared to be on unusually rough bromide paper, rubbed down after the prints were made with some abrading material, so as to leave the whole broken up, much as we find it in an ordinary gum-bichromate print on rough paper.

We do not say that was the process employed, nor can we say that it was equally successful in all his pictures. In the best subject the effect seemed rather overdone. The paper employed was too coarse in the grain. We cannot help remarking on the singular unsuitability of the frames and mounts this gentleman chose, and this was the more noticeable, that by far the largest proportion of the pictures in the Exhibition were admirably got up. Other exhibitors who deserve a word were J. Brown, W. Taylor, and Miss F. Marion. The last-mentioned goes in for a variety of subjects of an interesting rather than a pictorial nature. There were all kinds of curious things that, for a little want of skill in the printing, her exhibit would have been an admirable one of its kind.

Many of our exhibitions suffer from a too exclusive devotion to landscape work, and that under review is one of them. We would suggest to the members that there are other branches of photography—portraiture, figure studies, and architecture, for instance—which are well worthy of their attention. The Society having abolished awards there were no judges.

#### PHOTOGRAPHIC PAPER AND THE AMERICAN PAPER TRUST.

THE subjoined article, contributed by Mr. C. T. Sutton, to THE BRITISH JOURNAL OF PHOTOGRAPHY,\* should be interesting to American photographers just now, says *Wilson's Photographic Magazine*. For weeks little else has had attention except the changes in the printing-paper market, caused by the advance in the price of raw paper made abroad and almost universally used in this country.

Without being too sanguine, we believe that the action of the European Paper Trust is calculated to result in good for our country. The paper used for photographic purposes in America should be made in America, and nothing could be imagined so likely to bring about this desirable state of affairs as the stand taken by the manufacturers forming the Paper Trust. We have many mills here capable, were their enthusiasm aroused, of manufacturing photographic papers equal to the best made in Europe. The American Photographic Paper Company (of Boston), the Valley Paper Company (of Holyoke), and the Holyoke Paper Company, and other mills have been producing excellent paper for photographic use for some years. Their papers have been coated and sensitised, and have stood the tests required of them. The reasons why they have not

\* January 6, 1899, p. 10.



been more generally used by manufacturers of printing papers are, as far as we can discover: First, a preference for foreign-made papers as having an established reputation; and, second, that the coating of American-made papers with baryta has not always resulted as successfully as might be desired. These minor difficulties will, we trust, be speedily overcome, and, in a year or two, we look forward to a steady decline in the importation of European papers for use in photography. If our paper-manufacturers, producers of sensitised papers, and photographers unite in the desire to make and use American paper in place of that imported, we have little doubt but that the thing can be accomplished.

### THE LATE F. P. WRATTEN.

A CAREER which gave every promise of materially contributing to the advancement of scientific photography was ended on Saturday week, February 11, by the death of Mr. F. P. Wratten. The deceased gentleman, who was in the twenty-fifth year of his age, was the second son of Mr. F. C. L. Wratten, the respected head of the well-known firm of Wratten & Wainwright, dry-plate makers, Croydon. Becoming a student of chemistry at an early age, he soon acquired the degree of Associate of the Royal College of Science, and for several years occupied himself in the laboratory and emulsion department of Messrs. Wratten's manufactory. He took great interest in the preparation of high-speed emulsions, and, after several months' absence in America in the year 1897, returned to this country for the purpose of devoting himself to research work in orthochromatism. There is little doubt that the heavy strain imposed upon him by the close attention which he gave to this absorbing branch of experimental photography was the direct cause of the mental illness which led to his death. By training, inclination, and intelligence, the late Frederick Percy Wratten gave the greatest promise of one day occupying a high and honourable place in scientific photography, and we are sure that regret at the premature close of his life will be accompanied by wide and sincere sympathy with his family in their bereavement.

## Our Editorial Table.

### HINTON'S SQUEEGEEING AND MOUNTING BOARD.

Manufactured by Hinton & Co., 38, Bedford-street, Strand, W.C.

THIS useful piece of apparatus consists of a strong flat board, to which are attached, in such a manner as to be easily removable, several sheets of tough fibrous blotting boards, protected by a cover of strong rubber sheeting. To use for squeegeeing the sheets of ferrotype, celluloid, glass, or other material, bearing the prints to be squeegeed, are placed between the blotting boards and both hands used to squeegee on the rubber protecting sheet, the latter taking all the strain and drag, and the prints being subjected to a very even pressure. If ferrotype or celluloid is used, several sheets of prints may be squeegeed at once between the separate sheets, the top one being removed after each stroke of the squeegee.

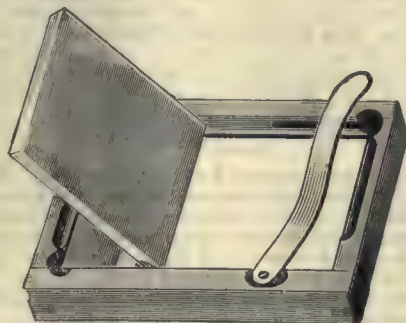


For mounting, the print, having been pasted as usual, is centered on the mount and laid on the blotting boards, directly under the rubber sheet, and the squeegee passed over first lightly and again with more pressure. For the rapid drying of prints the latter should be immersed in a bath of methylated spirits until the backs show a uniform semi-transparent appearance. They are then drained and laid in single layers between the blotting boards and heavily squeegeed. We can recommend this squeegeeing and mounting board to both professional and amateur photographers, who should find it of the greatest utility in squeegeeing, mounting, and drying prints. It is extremely well made and cheap.

### THE PRIMUS PRINTING FRAME.

Manufactured by W. Butcher & Son, Blackheath, S.E.

THESE printing frames are neatly made, cheap, and useful. They are made in stout wood without any projections, so that when packed away they occupy the least space. The springs are sunk, and, instead of

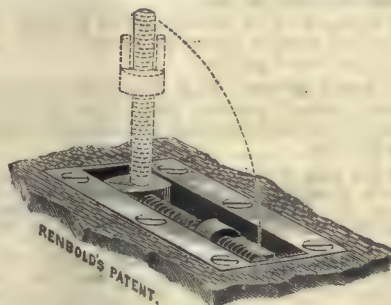


slipping under the ordinary projecting metal catch, they are passed into a groove in the frame. They are machine-made, and consequently perfectly true everywhere. The Primus frames are comfortable to handle, and will, doubtless, be appreciated by many photographers.

### A NEW CAMERA SCREW.

Manufactured by H. Renbold, 5, Jeffreys-road, Clapham, S.W.

THE screw and bolt as here illustrated are let into the bottom of the hand or stand camera. It thus forms a permanent part of the instrument to which it is fitted, and consequently does away with the risk of loss of the ordinary screw. Saving of time is claimed through the instantaneous fitting of the bolt on to the screw instead of, so to speak,



working about in the dark, trying to find the bush in the camera. In the case of a stand camera, this latter operation generally results in the scratching of the polished baseboard round and about the bush. The illustration shows the nature of the improvement, which should be greatly appreciated by all users of cameras, as it economises both time and temper, and prevents the loss of an indispensable item in camera work.

### SPECIMENS OF VELOX PRINTING.

By R. C. MURRAY, Garrick-street, Covent Garden.

AMONG those early to recognise the advantages of Velox for printing from amateurs' negatives was Mr. Murray, whose ability and experience in all branches of photography need no encomium at our hands. Mr. Murray has submitted to us a number of prints on Velox paper, which are among the very finest of the kind we have seen, and some of which make it clear that the paper in skilful hands gives a considerable amount of latitude—a quality much to be desired when amateurs' negatives are being dealt with. As a careful and painstaking photographic printer Mr. Murray is worthy of the highest recommendation.

THE London and Blackfriars Photographic Supply Company, of 134, Borough, S.E., have been good enough to send us one of Messrs. Charles Letts & Co.'s very thin Peerless Pocket Note-books, which has a self-indexing memorandum tablet attached to the under cover, thus enabling any "place" in the little book to be retained. But the most acceptable feature of the note-book is a Railway Accident Insurance Coupon for 500l., available up to March 31, 1900. We have no doubt that some hundreds of these little books will quickly find their way into photographers' pockets. They measure 4 x 2½ inches, and are handy to have in a railway collision.

The Company propose presenting one of these note-books to any customer placing an order with them to the amount of 5l. net, from Feb. 16 to April 30.



## BIRABROOL.

Sole Agent: OSCAR SCHOLZIG, 9, New Broad-street, E.C.

THIS is a solution for enabling the amateur to make his own sensitised paper, sensitised view post cards, or pictorial letter headings. The following are the instructions:—Spread the liquid with a camel's-hair brush—which must be free from any metal parts—thinly over the part of the paper which is to receive the picture, and dry it for a few minutes in the dark. When dry, place it in the printing frame under the negative, and by sunlight you will get a fully printed picture in seven to fifteen minutes. When fully printed, put the picture for one minute into the fixing bath—50 grains sulphite of soda, 50 grains hyposulphite of soda, 5 ounces of water—wash in clean water for five to ten minutes, and dry.

MESSRS. A. & M. ZIMMERMANN, of 9 and 10, St. Mary-at-Hill, E.C., send us samples of the fixing salts manufactured by the Actien Gesellschaft für Anilin-Fabrikation, Berlin. This preparation is packed in four, eight, and sixteen-ounce blocks, which simply require dissolving in eight times their weight of water to give an acid fixing bath, of the strength necessary for negatives. It is then ready for immediate use. The samples reached us in the form of a very fine white powder, which, upon trial, was found to give a clean and excellent fixing bath.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, March 1, at eight o'clock, lecture by Mr. Sydney Keith, "Up the Nile."

MR. J. EPSTEIN has been awarded a diploma at the Grahamstown Exhibition, South Africa, for his show of mouldings, mounts, &c.

MR. A. E. ALLEN, Hon. Secretary of the South London Photographic Society, has removed to "Beaulieu," Hollingbourne-road, Herne Hill, S.W.

ROYAL PHOTOGRAPHIC SOCIETY.—Tuesday, February 28, Technical Meeting. "Apparatus for Animated Photography," by Mr. Birt Acres. To be held at 12, Hanover-square, W., at eight p.m.

On Thursday, February 16, at the Goldsmiths' Institute, there were 1500 persons present at Mr. Bynoe's lecture on "The Camera and the Wheel." This is believed to be a record audience.

THE AUSTIN-EDWARDS MONTHLY FILM NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Mr. Charles R. Taunton, care of Mrs. North, Springfield-avenue, Huddersfield, for his negative, *Among the Hazels in the Hollows*.

THE names of the prize-winners in the Warwick Monthly Competition for February are:—1st prize, 20s., Mr. T. Knox, Charlotte-villa, Sydenham, Belfast; 2nd prize, 10s., Mr. Frank M. Sutcliffe, 12, Skinner-street, Whitley; 3rd prize, 5s., Mr. W. B. Green, Gramere, Gladstone-road, Watford, Herts.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On Thursday next, March 2, at eight o'clock, Mr. J. McIntosh will read a paper on "Intensification and Reduction," with illustrations. The Hon. Secretary will be pleased to see any one interested in the subject at this meeting. Visitors are always welcome.

OCCASIONAL LECTURES AT BEDFORD COLLEGE.—The first of the series will be given by Dr. W. J. Russell, F.R.S., Chairman of the Council, on Friday, February 24, at five p.m., at Bedford College, York-place, Baker-street, W. Subject: "How Pictures can be taken on a Photographic Plate in the Dark," with lantern illustrations.

EXTREMELY ANCIENT MIRRORS.—At one of the recent sessions of the French Academy Berthelot described three metal-backed glass mirrors of great antiquity which had been originally discovered in Thrace and Egypt. The metal backing of these mirrors consists of almost pure lead, which, in the molten state, appears to have been poured on the concave surface of discs cut from balloons of blown glass. This appears to be a highly important contribution to the history of the arts among the ancients.

BROKEN glass, usually considered one of the most worthless of things, promises to become an article of commerce in some parts of the world. In Switzerland and France the manufacture of glass brick for paving purposes has just been taken up on a large scale, and Geneva already enjoys the distinction of possessing several glass-paved streets. The new material looks well, and gives a safe footing for horses. Nice also will have a glass pavement in the near future. The glass scrap is first heated until soft, when it is compressed into bricks. By this treatment the glass loses its transparency, but its strength and power of resistance to shock and fracture are increased. Glass scrap has hitherto been converted into ornamental tiles.

CONSIDERABLY over two hundred ladies and gentlemen attended the Fourth Annual Smoking Concert of Mr. J. Fallowfield's employees, which was held on Friday evening, February 17, at the London Tavern, Fenchurch-street, E.C. Mr. F. W. Hindley occupied the chair, and among the visitors were Mr. Hindley, jun., Mr. Thomas Bedding, Mr. A. E. Dean, Mr. J. A. Sinclair, Mr. R. Child Bayley, Mr. S. H. Fry, and Mr. A. Mackie. Mr. H. J. White was in the vice-chair, and Mr. F. J. Goode was, as hitherto, a hard-working and vigilant Hon. Secretary, and under his direction a long and amusing programme of songs, recitations, and other items was carried through. During the evening the thanks of the company were tendered to the Chairman and the Hon. Secretary, and the entertainment concluded amidst the manifestations of pleasure of those present. All concerned are to be congratulated on a great success.

CROYDON CAMERA CLUB.—The meeting on Wednesday, February 15, was devoted to a lantern lecture upon "Hand-camera Work," read by the President on behalf of Mr. J. H. Gear. This was followed by the inspection of a large number of lantern slides by the members. At the instance of the President, seconded by Councillor J. Noaks, it was resolved "that the Hon. Secretary be instructed to convey the Club's sincere sympathy with Mr. Wratten and family at their bereavement."

NITRATE OF SILVER STAINS.—A solution of iodine in ammonia water, the so-called colourless tincture, will remove nitrate of silver stains from the hands, clothing, &c., but owing to the danger of the formation of nitrogen iodide, which is a very powerful explosive, it is not recommended. A solution of iodine in iodide of potassium dissolved in water is nearly as quick, and quite as effective. Dissolve 15 parts of iodide of potassium in 50 parts of water, and to the solution add 10 parts of iodine. When the latter is dissolved, add sufficient water to make 500 parts. Keep in a well-stoppered bottle. Treat the spots with this, and after a few minutes with a ten per cent. solution of caustic soda, which will remove the silver iodide formed by the first treatment.—*National Druggist*.

THE Beverley Photographic and Sketching Society's Sixth Annual Public Exhibition of Photographs, Paintings, and Drawings will be held in the Assembly Rooms, Beverley, on Easter Monday and Tuesday, April 3 and 4, 1899. The following are the photographic classes:—Section A. (open): 1, Landscape, Seascape, and River Scenery; 2, Architecture; 3, Portraiture and Figure Studies; 4, Instantaneous Hand-camera Work, showing Moving Objects (six direct prints); 5, Enlargements; 6, Lantern Slides (set of six). Section B (members only): 1, Landscape, Seascape, Architecture, and River Scenery; 2, Portraiture and Figure Studies; 3, Enlargements; 4, Lantern Slides (set of six, the winning sets to become the property of the Society). The Hon. Secretary is Mr. T. J. Morley, Toll Gavel, Beverley.

NEW USES FOR GLASS.—Experiments have lately been made with glass as a substitute for metals for bearings. The most suitable kinds were found to be bottle and ordinary window glass. The bearings were cast in moulds, in two pieces. They gave the best results when mounted in elastic supports. It was found to be necessary that the revolving parts should be well balanced and the shafts accurately centered. The results are stated to have been that the glass bearings require less lubrication, have less friction, and in many cases are more advantageous than metal bearings, though in some cases they afford less security than others. It is recorded in the French journal, *L'Edairage Electrique*, that at Marseilles glass tubes are being used as underground conduits for telegraph wires and for carrying electric-light wires in factories, theatres, &c.

NORTHAMPTON EXHIBITION.—The following are the Judges' awards in the open classes:—Champion Class: Silver medal (No. 19), *Sunlight and Shade*, by Mr. F. W. Bannister; bronze (No. 5), *The Storm Lifting*, by Mr. C. F. Inston. Portraiture, Genre Studies and Animals: Silver (No. 68), *Portrait*, by Mr. Smedley Aston; No. 86, *Portrait*, *Christopher Wilson, Esq.*, by Miss Boden. Architecture: Silver (No. 251), *Ely*, by Mr. C. S. Baynton; bronze (No. 224), *Lincoln Interiors*, by Mr. John H. Gash. Hand-camera Work: Silver (No. 275), *The Olive-gatherer*, by Dr. E. G. Boon; bronze (No. 265), *Series* by Mr. W. E. Inston. Landscape, Seascape, and River: Silver (No. 306), *End of a Winter's Day*, by Mr. W. A. Fraser; bronze (No. 296), *Evening on the Chase*, by Mr. W. Smedley Aston. Lantern Slides: Silver, Mr. E. Marriage; bronze, Mr. C. M. Wane.

IRON FELT.—This is the name given to a new insulating substance made at the Adlershof Works, near Berlin, and for which numerous applications have been found. The felt consists essentially of long and strong woollen fibres, impregnated with a by-product of petroleum, and then coated (with a certain amount of penetration) by gelatine rendered insoluble, and also (alternatively or in addition) with indiarubber, afterwards vulcanised. After being subjected to considerable pressure, the iron felt assumes the form of plates, measuring 20 sq. dm. (2 sq. ft. 22 sq. in.) and upwards, with a thickness varying from 1 to 5 centimetres (13-32 in. to 2 in.). These plates are very elastic, being practically imperishable, while they will stand a pressure of 1458 kilogrms. per sq. cm. (20,736 lbs. per sq. in.); and their surface is so hard as not to be cut by the sharp edges of bolt heads or of iron girders. Placed as a cushion between rails and their chairs, or sleepers, underneath plumper-blocks or between engines and their foundations, this substance is also stated, by *La Nature*, to prevent vibration.

THE BIRMINGHAM INDUSTRIAL EXHIBITION.—The Photographic Section of this Exhibition bids fair to be a very large one, and Mr. Welford, who has it in charge, informs us that he is surprised at the great number of applications for prospectuses, which have been arriving by post at the rate of eighty per week, after 4000 preliminary copies were dispatched to all well-known



exhibitors. In a former issue we referred to the fact that the medals offered would be of a design differing from those as usually given, and above we are able to give an illustration of it. The wording will, of course, be altered. The Exhibition will be opened on Monday, March 20, by the Lord Mayor of Birmingham, and Mr. Welford will endeavour to post a printed list of awards to every competitor on that night.



**PERMANENT INK FOR GLASS AND METAL WARE.**—The following inks are suitable for labelling and otherwise marking glass or metal ware. The marks are not washed off by water. Black: Fluid Indian ink, 11 parts; sodium silicate, 1 to 2 parts. White: Chinese white or barium sulphate, 1 part; sodium silicate, 3 to 4 parts. This ink must be kept in stoppered bottles and well shaken up before use. The writing is done with a steel pen. When dry the ink is affected by very few reagents, but can easily be scraped off with a penknife. The strength of the sodium silicate is not given, but probably the ordinary commercial thirty-three per cent. solution is referred to. The colours are to be well dried and finely powdered before being used.—*Pharm. Zeit.*, 43, 860, after *Deutsch. Mech. Zeit.*

## Patent News.

The following applications for Patents were made between February 6 and February 11, 1899:—

**CINEMATOGRAPHS.**—No. 2630. "Improvements in or relating to Cinematographs." H. MORRISON.

**DEVELOPERS.**—No. 2756. "Improvements in Photographic Developers." Communicated by The Chemische Fabrik auf Actien vormals E. Schering, Germany. A. ZIMMERMANN.

**ANIMATED PHOTOGRAPHS.**—No. 2840. "Improvements in Apparatus for Displaying Animated and other Pictures, Advertisements, and the like." W. A. SEYMOUR.

**LENSES.**—No. 2854. "Improvements in Photographic Objectives." Complete specification. C. P. GOEZE and E. VON HOEGH.

**PHOTOGRAPH-CARRIERS OR STANDS.**—No. 2908. "Improvements in Carriers or Stands for Photographs and the like." J. CADBURY and F. W. LAMBERT.

**ANIMATED PHOTOGRAPHY.**—No. 2954. "Improved Means applicable for use in taking Photographic Views in Rapid Succession or in presenting the same in like manner." C. RALPH.

**LENSES.**—No. 3041. "Improvements in Photographic Objectives." Complete specification. E. LEITZ.

**COATING PAPER FILMS, &c.**—No. 3086. "Improvements in the Method, Means, and Apparatus for Coating Photographic Paper, Films, and the like, and in the Manufacture of Photographic Materials." J. E. THORNTON and C. F. S. ROTHWELL.

**VIGNETTING APPARATUS.**—No. 3129. "Improvements in and connected with Photographic Vignetting Apparatus." C. S. SOUTHIN.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
27.....	Beverley	Prize Slides.
27-Mar. 4	Birmingham Photo. Society	Annual Exhibition.
27.....	Bradford Photo. Society	Some Analogies of Light. Edgar A. Heywood.
27.....	Camera Club	Art Enamels. Cyril Davenport, S.S.A.
27.....	Kingston-on-Thames	Hand-camera Work. John H. Gear.
27.....	Oxford Camera Club	Home Portraiture. Miss Acland.
27.....	Richmond	Lecture: Practical Points in Exposure, Developing, and Printing.
28.....	Hackney	Annual Dinner.
28.....	Leeds Photo. Society	Colour and its Reproduction by Photography. E. J. Wall.
28.....	Newcastle-on-Tyne	Demonstration: Photogravure. Messrs. Corder and Spence.
28.....	Royal Photographic Society	Apparatus for Animated Photography. Birt Acres.
28.....	Shropshire	Invitation Exhibition of Members' Slides.
March.		
1.....	Brentford	Lantern Evening.
1.....	Croydon Camera Club	Fortieth Public Lan'ern Show.—A Visit to Penshurst Palace. D. P. Roberts.
1.....	Leeds Camera Club	Paper by A. Horsley Hinton.
1.....	Photographic Club	Up the Nile. Sydney Keith.
1.....	Southsea	Photographic Chemistry. H. T. Lilley, M.A.
1.....	Woodford	Some Notes on Photographic Chemicals. Mr. Emier.
2.....	Ashton-under-Lyne	Sale of Monthly Magazines.
2.....	Bolton Mutual Photo. Society	Our Trip to Spain. N. S. Kay.
2.....	Leigh	Highways and Byways in Venetia. S. L. Coulthart.
2.....	Liverpool Amateur	Demonstration: Carbon and Gum-bichromate. Jos. Appleby.
2.....	London and Provincial	Intensification and Reduction. J. McIntosh.
3.....	Croydon Microscopical	Meeting to Arrange for Summer Excursions.
3.....	West London	Holiday Rambles. W. A. Brown.
4-11.....	South London	Tenth Annual Exhibition.

### ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 21.—Photo-mechanical Meeting.—Mr. Chapman Jones, F.I.C., F.C.S., in the chair.

#### OFFICERS AND COUNCIL.

The CHAIRMAN announced that the Council had made the following appointments:—*Hon. Secretary*, Colonel J. Waterhouse; *Hon. Librarian*, Mr. Horace

Wilmer, C.E.; *Hon. Solicitor*, Mr. Francis Ince; *Hon. Editor of the Society's "Journal"*, Captain W. de W. Abney; and that they had elected Messrs. J. A. Hodges and J. J. Vezey to fill the vacancies thus occasioned among the ordinary members of the Council.

### PHOTOGRAPHY OF LIGHTNING IN DAYLIGHT.

Mr. F. H. GLEW gave a "Demonstration with Wireless Electric Waves for Actuating Photographic Apparatus and for Photographing Lightning in Daylight," illustrating a most interesting and comprehensive lecture upon the subject. Commencing with a consideration of the analogy between lightning sparks and sparks produced in the laboratory, the difference in the conditions, and the effects of the temperature and pressure, he proceeded to deal with the various types of sparks and the oscillation and periodicity of the disruptive discharge, pointing out that, whilst the sparks from a coil result from a very sudden rise of potential, lightning probably results from a somewhat more gradual rise of potential, increasing until bursting point is reached, caused by the union of particles of water, a condensation of electricity being thereby produced. In attempting to photograph lightning flashes at night in the usual manner, he had been surprised at the large proportion of failures he had had, many plates being entirely blank, although he was quite sure that the camera was correctly placed in the line of sight. He had thought that this was probably caused by the extreme vividness of the lightning producing reversal; but he found that he got better results with the lens working at  $f/8$  than at  $f/16$ , and also that a rapid plate, preferably with a double or triple coating, was an advantage. The next point considered was the question of the duration of the lightning flash, which had been estimated variously from millionths of a second to 1-10,000 of a second; but the lecturer had ascertained that these estimates were not borne out by his own recent photographic measurements by using a lens made to vibrate at a known rate, or by means of a photographic plate in motion. One of his experiments showed that with a lightning spark of three components the entire flash lasted  $\frac{1}{10}$  of a second, the time between one component and another being about  $\frac{1}{100}$  of a second, and he thought this experiment demonstrated the fact, that the lightning flash was compound in character and had a perceptible duration. The lecturer next dealt with the compound nature of lightning, not one spark but several passing down the same path, the radiation of Hertz waves during a lightning discharge, and demonstrated an apparatus which he described as a Hertzian sentinel, for giving warning of an approaching storm; and he then proceeded to discuss the nature of Hertz waves, their detection by a scraping spark gap, and the action of the coherer detector, and to analyse the Hertz waves, dealing with syntony and "skin" currents. Photography of lightning in daylight, he said, had been attempted, and difficulty arose in consequence of the fogging of so many plates, and it had been noticed that the flashes thus obtained were dark instead of light, a reversed effect; but Mr. Clayden, who had investigated this question, found that the sky fog produced in waiting for a spark did not reverse the spark, but that the same amount of sky fog following the spark did reverse it, a curious fact which he had experimentally corroborated, and which he demonstrated by means of slides. This showed that the fog resulting from waiting for a flash might be disregarded, and that, when a flash had been received by the plate, the lens must be at once capped. Knowing that a lightning flash is compound in character, and that it emits Hertz waves, the possibility arose of photographing lightning in daylight by causing the Hertz waves emitted by the first component of the compound flash to go through a coherer, and in that way actuate a photographic shutter. Mr. Glew exhibited and very fully described the manner in which he had adapted a Thornton-Pickard shutter for use with this object, and by means of which he could work the shutter at  $\frac{1}{100}$  of a second, a speed more than sufficient for the purpose. He regarded it as quite possible to arrange a shutter which would capture not only the second, but also the first, component of a flash. The light had to travel through glass before it reached the plate, while the Hertz waves went through the ether. The speed through the ether was the speed of light, whilst the speed through the glass was only two-thirds of that through glass; it might therefore be possible to actuate the shutter before the light had had time to pass through the glass.

Mr. Glew's paper will appear in full in the Society's *Journal*, to which we must refer those of our readers who are interested in the subject, it being impossible here to do more than briefly indicate the lines which he followed.

Mr. J. E. WIMSHURST, in the course of some remarks, said he would be most willing to lend both time and material to the prosecution of further research in this interesting direction.

Mr. SANGER SHEPHERD referred to some experiments which he had made in 1884 and 1887, in which he obtained photographs of dark flashes, and to some theories advanced by Sir George Stokes to account for them. He said he had made many attempts to photograph a flash in daylight, but had not succeeded in doing so.

Mr. W. E. DEBENHAM, referring to the subject of the dark flash, thought it might be regarded as certain that, with the plates in use at the present time, if there were a flash strong enough to cause reversal, there would be on both sides of the reversal line a positive image due to irradiation or reflection from the illuminated path.

Messrs. T. Bolas, A. Haddon, C. F. Townsend, the Chairman, and others also took part in the discussion, and Mr. GLEW having briefly replied, the proceedings closed with a hearty vote of thanks to him for his valuable communication.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 16.—Mr. H. C. Rapson in the chair.

Mr. A. MACKIE showed an artificial negative or sensitometer scale made upon the pattern of Warnerke's sensitometer, and consisting of a series of increasing thicknesses of paper. He called particular attention to a device intended to overcome the reproduction on the test plate of the granularity of the tracing paper employed. For this purpose he had provided upon one side a piece of cardboard, which prevented the test plate from coming into closer relation with the series of densities than the thickness of the cardboard.



allowed. Obviously, if absolute contact between the two were permitted, the grain of the paper would be copied upon the plate, and this would be likely to interfere with the critical nature of the readings. The thickness of the cardboard diaphragm had the effect of forming a cell between the sensitive plate and the graduated standard, resulting at once in a more even deposit and one which could be read with more accuracy than a granular deposit.

Mr. J. S. TRAPE suggested that, if the layers of paper had been enclosed between two sheets of glass, the effect would be the same.

Mr. MACKIN thought that such a course would prevent the formation of a sharp line between the tints, and to facilitate the comparison of tints sharp edges were very necessary.

Mr. TRAPE thought that a sensitometer scale with a double set of graduated densities was preferable to a single one, as by such an instrument two plates of different make could be exposed under identical conditions at one and the same time.

Mr. Tom Bright was kind enough to lend a very fine collection of lantern slides for display. The series embraced specimens of all classes of subject, those of marine and cloud effects calling particularly for favourable mention. The technical quality of the slides, as well as their pictorial merits, was equally deserving of commendation, and the formula adopted in making the slides was considered worthy of trial. It is given below:—

A.	
Pyro .....	20 grains.
Ammonium bromide .....	20 "
Metabisulphite .....	50 "
Water, to .....	10 ounces.
B.	
Ammonia (880) .....	70 minims.
Water, to .....	10 ounces.

Equal parts. Ten drops of a ten per cent. solution of ammonium bromide may be added to each ounce of developer as required, but a proportionately longer exposure must be given. Thomas's plates were used.

Mr. Lewis Medland supplemented the above with a small selection of views in Copenhagen, showing the chief places of interest, statues and monuments, and street life, concluding with some examples of Thorwaldsen's sculpture preserved in the museum of that name, which forms one of the chief attractions of the city of Copenhagen.

**Croydon Camera Club.**—At the entertainment on Saturday, 11th inst., provided by the Croydon Camera Club, the attendance was a record one for the series now being given by the Y.M.C.A. at Horniman Hall. The programme was, moreover, one which seemed to have just hit off the taste of the audience, if a constant accompaniment of laughs and exclamations, varied by applause, are criterions. The President of the Club (Mr. Hector Maclean) had arranged the display, and did the needful as regards explanation. The show opened with a visit to Hatfield, which afforded the lecturer much matter for comment. A peroration, in which the Prime Minister's ancestor, Lord Burleigh, and his Sovereign, Queen Elizabeth, were compared with the present Lord of Hatfield and our illustrious Queen, fairly brought down the house. Many other kinds of notable people and places were touched on. Thus, we had the King of Ratecatchers, with his Royal insignia of silver "Bandicoot" rats; R. B. Lodge ("the Camerist in a Sack"), with some remarkable bird studies; and the Mountaineering Lady, Mrs. Main; some sermons by "Sambourne," of *Punch* fame; the Father o' Pearl; a Man of Many Marvels (Sir David Salomons, Bart.); notable county cricketers, of whom J. T. Brown obtained an ovation; as did Doughty's dogs. Dick Turpin's house, which until lately stood at Thornton Heath, was an interesting scene, contributed by Mr. W. H. Rogers, who also obtained a flattering reception for his sea and cloud effects, as did Mr. A. K. Taylor for his after-dark pictures. A collection of about fifty striking zoological studies by Mr. Henry Sandland brought the slides to a brilliant conclusion; after which Mr. Victor Bender showed, by means of the Velograph, a selection of moving photographs, which the audience were markedly pleased with.

**Hackney Photographic Society.**—February 14, the President (Mr. E. Pattock) in the chair.—A large number of prints were brought up, showing the result of toning with Messrs. Burroughs & Welcome's new sodium-formate tabloids, of which samples had been distributed at a previous meeting. The examples showed that a great variety of pleasing tones were obtainable with the sodium formate, and several members spoke of the economy of the toning bath so made. It had also been observed that the bath would not keep for a second time of using, and that it gave browner tones than sulphocyanide. Mr. J. H. GEAR gave a lecture on

#### HAND CAMERAS.

Dealing, among other things, with the choice of pattern, he said that this would, of course, depend upon the needs of the user, but he personally had a great liking for the twin-lens pattern. The working lens of this should, when possible, be an anastigmat; the finder lens might be a cheaper kind, so long as it was of the same focus. As to shutters, he gave preference to a focal plane working in front of the plate on account of its high efficiency; the next best he considered to be the ordinary roller-blind pattern, working in front of, or behind, the lens. He preferred dark slides to any other form of plate-holder, not excepting a changing box, for the latter sometimes got out of order, and was always more or less liable to cause dust. Concerning the shutter release, the worst possible position for this was at the side of the camera, and the best on the top of the same, for in the latter case the thumb should be used to make the exposure, and the downward pressure should be counterbalanced by a corresponding upward pressure of the fingers below.

**North Middlesex Photographic Society.**—February 20, Mr. Charles Beadle in the chair.—Mr. A. W. W. Bartlett was elected a member of the Society. Mr. H. W. BENNETT, F.R.P.S., gave a lecture, entitled

#### ELEMENTARY NOTES ON LENSES.

The lecturer started by saying that the usual advice to a beginner was, Get a

good lens; but the fact remained that, in the hands of one who thoroughly understood its capabilities, an inferior lens could be made to give better results than a first-class article in the hands of one who understood nothing about it. The lecturer used large diagrams and also the blackboard all through his lecture to make clear his meaning. Rays of light, he said, travelled in straight lines; on passing through a sheet of glass they are bent or refracted to one side, but, on emerging therefrom, go on, if the sides are parallel, in the same direction. If they impinge on a prism, they are bent as before, but on emerging they are bent still more, towards the base of the prism. A lens may be regarded as a series of prisms, with the apex at opposite ends. The rays from a distant object which strike the lens thus meet at a point the other side, which is called the focus. He explained the different forms of single lenses, and that they, in addition to refracting the rays, also dispersed the colours, rendering it impossible to get the visual or yellow rays to coincide on the screen with the actinic or blue rays. This is overcome by combining two different kinds of glasses of different refractive and dispersive powers. The equivalent or solar focus of a lens was the nearest point to it at which objects could be focussed, and is obtained when parallel rays pass through it, as from the sun or any very distant object. He explained the use of stops, and the relation they bear to the focus of the lens; also the method of calculating the focus by getting the image of an object the same size on the screen, measuring the distance between the object and the image, and dividing by four. He explained depth of focus, which did not vary with the quality or kind of lens, but bore a fixed relation to the stop used. The covering power of a lens did not vary with the size of the stop, but the latter affected the defining power. The roundness of the field of most lenses was explained, and the means used to remedy it. The distortion of single lenses was generally much exaggerated, and, provided care was used not to include too wide an angle or get long straight lines near the edge of the plate, they could be used for architectural work quite well. He also touched on astigmatism, and gave instructions how to test a lens at home to find out its capabilities. Several questions were asked by members. One was, How to fix the position of a stop in an unmounted single lens? Mr. BENNETT said it was generally fixed by trial and error, but, as a general rule, it was one-sixth to one-eighth of the focal length, depending on its diameter.

**Richmond Camera Club.**—February 13, Mr. Cambrano in the chair.—Mr. E. MORGAN, of Messrs. Morgan & Kidd, gave an account of

#### MODERN METHODS OF BOOK ILLUSTRATION.

Mr. Morgan first referred to the results obtained by hand work or wood blocks, metal plates or lithographic stones, which, up to the advent of process work, were the usual means of producing illustrations for books. In all these the mode of obtaining the half-tones was by breaking up the white surface of the paper by lines or dots, and Mr. Morgan showed how the same result was obtained in the case of a photographically prepared block by photographing the subject through a glass screen ruled with very fine lines, close together, and crossing each other at right angles. He showed a Levy screen ruled with lines eighty to the inch, and the negative, prepared zinc plate, finished block, and prints obtained by means of it.

**Birmingham Photographic Society.**—February 14 (Beginners' Evening).—Mr. W. T. GREATBATCH gave a paper and demonstration upon

#### PLATINUM PRINTING AND DEVELOPING.

In his opening remarks Mr. Greatbatch said that the process was one of very great simplicity, and the only difficulty to the beginner was judging of the depth of printing, but, after a very little careful work, there should be no difficulty on that score. Sepia platinotypes he considered the finest sepia prints obtainable by any process. It was very necessary with the sepia paper to use a rubber sheet in the printing frame to ensure that the paper be perfectly dry, but this was not so necessary with the cold-bath A A paper. Very pleasing sepia prints could be obtained upon the cold-bath papers by adding a few drachms of a solution of bichloride of mercury to the developer, but he could not say what effect (if any) it would have upon the permanency of the print. For blue-black tones the addition to the developer of a little oxalic acid helped matters considerably. If prints were found to be under-printed, they could be very often saved by raising the temperature of the developer. During the discussion which followed, Mr. C. J. FOWLER advised the use of an actinometer in printing, and it was advisable to write upon the corner of the negative the exposure, according to the actinometer, for future reference.

**Liverpool Amateur Photographic Association.**—February 16.—Mr. F. ANTON gave a demonstration on

#### DEVELOPMENT.

Mr. Paul Lange (President) presided. Mr. ANYON, after dealing with the theory of development, proceeded with a practical demonstration, and developed several negatives, showing under, over, and correct exposures, and how to modify the developer to suit each case. Throughout the lecture frequent discussion arose between the members and the lecturer dealing with the subject. At the conclusion, Mr. JOHN H. WELCH (Vice-President), in proposing a hearty vote of thanks, spoke of Mr. Anyon's merits, and the great benefit afforded the members by the lecturer's knowledge of the art. Mr. Anyon then presented the Society with the three negatives used to demonstrate his lecture. Before the close, Mr. A. C. BALDWIN introduced a new printing paper, Gravura, and, by practical illustration, showed how several different coloured prints might be obtained by its use.

#### FORTHCOMING EXHIBITIONS.

1899.

February 24..... Hastings and St. Leonards. Exhibition Secretary, A. Brooker, 21A, Wellington-place, Hastings.

" 24, 25 ..... Edinburgh Photographic Society. Hon. Secretary, J. S. McCulloch, 2, George-street, Edinburgh.



February 24, 25 ..... Woolwich Photographic Society. Hon. Secretary, F. W. Machen, 161, Griffin-road, Plumstead, S.E.  
 ,, 27-March 4 Birmingham. C. J. Fowler, Court Mount, Erdington, near Birmingham.  
 March 4-11 ..... South London. Hon. Secretary, A. E. Allen, 27, Princes-square, Kennington Cross, S.E.  
 ,, 14, 15 ..... G.E.R. Mechanics' Institution (Photographic Section), Stratford, E. Hon. Secretary, H. W. C. Drury, St. Oswald's, Downs-road, Clapton, N.E.  
 ,, 15, 16 ..... Brentford.  
 ,, 20-May 13 ..... National Trades and Industrial Exhibition, Bingley Hall, Birmingham. Manager, Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### STILL ANOTHER PRINTING PAPER WANTED.

To the EDITORS.

GENTLEMEN,—In view of the issue of new rapid printing development papers, in my opinion the goal is not reached yet or likely to be (for professional use) by this innovation. The difficulty lies in the very rapid development, and consequent difficulty of getting each print of the same colour and depth.

Still it is a step in the right direction, and I should like to suggest that, if makers could issue a paper that, although it could be printed in a reasonable time by gaslight, and then slowly developed, say, half a dozen or a dozen at a time, like toning, so that depth and colour could be deliberately noted, it would be far more acceptable to the professional man, especially if a slightly visible image would give a guide to exposure.

In my opinion, from what I have seen, the old albumen or newer P.O.P. will not be quickly supplanted where time allows for printing out.

OTHELLO.

### APPRENTICES.

To the EDITORS.

GENTLEMEN,—Just a few lines to express my warm appreciation of your leader of last week, "Unanswerable Questions." One cannot but admit that in most cases they could be better solved by the querists themselves with a little observation and theory.

You certainly hit the nail on the head in your remarks as to apprentices and their masters; in such cases the latter are often the first to advertise, "No duffers need apply," and offer sweating wages in the bargain. It is to this class that your article may cause offence, and properly so, for they are degrading photography to the detriment of those firms who work theoretically and believe in fair remuneration both for themselves and their employees.—I am, yours, &c.,  
 AN ADMIRER.

### THE R.P.S. AND PROFESSIONAL PHOTOGRAPHERS.

To the EDITORS.

GENTLEMEN,—As a professional, I trust something practical will yet come out of the letter by Mr. Harris in the JOURNAL of January 6. When I read it, I said Mr. H. at last has "hit the nail on the head."

Of late years there have been many schemes set going to raise the status of the profession. Doubtless, the professionals looked on with mixed feelings on the scheme of the Royal to create or make Fellows. I think whoever started that should be made a knight or K.R.P.S., as it made the guineas to flow on.

But it can easily be seen that one can call themselves members or Fellows of the Royal, and that F.R.P.S. or M.R.P.S. or M.E.P.S. will have the same glitter in the eyes of the public, and won't draw the public if good photographs are not given to customers.

I assert that a man can be an F. or M.R.P.S., and yet not qualified to conduct a business as a photographer. What is wanted now is a scheme or association that can guard the public from any amateur or shamateur who can buy a camera, &c. (perhaps on credit), and start a studio and call themselves photographers or artists.

It is disgraceful and a fraud on the public that any one can be free to rush into business who has no experience or knowledge of the work.

It is this gap which needs to be shut up. One needs only look over your Answers to Correspondents to see the gross ignorance of those who inquire of you about the smallest matters. You would need to do nothing else, but go through these places and instruct these fools who rush in to open studios. I often wonder how long some of them exist.

I could give instances of studios being opened by some ignoramus, and even specimens from others shown as their own work, and, when customers come there not knowing, they only took the photos they had taken for them and put them in the fire.

In justice to the public, I maintain that no one should be allowed to open a photograph business until they have gone through a practical training in a good studio and served a proper time, and then they should have proper credentials to that effect.

No one dare call themselves doctors, or chemists, or even captain of a vessel, who are not qualified, but any sham can open a photographic business and thus deceive the public.

Many professors and even tradesmen protect themselves this way, but photographers have no protection.

This important thing has been lost sight of. Something should be done, but how it should be wrought I leave to others to suggest. Mr. Sutcliffe writes another sensible letter, but no one takes up the subject. I write this to keep the matter from going into oblivion.

Let the Royal and Salon, &c., go on their own course, but that need not hinder the profession from being established on a better foundation than what it is.

I will guarantee that you could find many good practical professionals who have for years kept going a good business, and gathered to themselves a good connexion, and yet that won't qualify them for a F.R.P.S., neither would their work be received at some exhibitions.

It is a pity your criticisms on this last season's Royal Photographic Society Exhibition were not printed in every paper in Britain. *Vide* p. 631 of JOURNAL, September 30, 1898; you there say: "There are some photographs hanging in the Pall Mall just now which we should disdain to criticise in our weekly Answers to Correspondents column." So that is the up-to-date photography! Verily it needs a reformation.

I do not write as a despondent exhibitor, nor yet as one who has not done a good business, but as, yours, &c.,  
 PRO BONO PUBLICO.

[We do not, of course, agree with the writer of the foregoing letter in his criticism of the Royal Photographic Society and its Fellowships; but we refrain from denying it publication, inasmuch as we never refuse a photographer the opportunity of airing his views on a subject of such manifest importance as the advancement of the material interests of his profession.—ED.]

### THE LEEDS CAMERA CLUB AND THE YORKSHIRE PHOTOGRAPHIC UNION.

To the EDITORS.

GENTLEMEN,—Will you kindly allow me to trespass on your valuable space to reply to the mis-statements contained in the speech of the President of the Leeds Camera Club, reported in last week's issue. It is not my intention to dispute the right of this Club to do that which it thinks best for its own interests. The reasons assigned for the action taken were certainly debatable.

Mr. Warren states: first, that other attempts at federation have failed; second, that photographic societies are conflicting atoms, and therefore cannot be federated; third, that the scheme was all Bradford, and that the societies of Yorkshire were to be united to these twelve Bradford gentlemen; fourth, "that the Leeds C. C. was not a charitable institution to give lectures to some societies."

To take the first point. Personally, I am not aware there has ever been any attempt to unite for mutual benefit the photographic societies of Yorkshire, certainly not on the present lines. Presumably, Mr. Warren refers to the Royal Society's Affiliation scheme; but why has this failed in Yorkshire? In my opinion, because of the lack of sympathy displayed towards the movement by the Council of the R.P.S. I could give other reasons: the objections of Yorkshiremen to be tacked on to a London Society; the distance between present organization and subscribing society, making direct representation an impossibility; the advantages offered by the central authorities not being commensurate with the amount paid, and so on.

But a federation of Yorkshire societies, managed by Yorkshire delegates, will suffer from none of these disadvantages.

The second point. I really cannot accept the atomic theory of Mr. Warren as applied to photographic societies. It is not the intention of the Union to destroy the individuality of any society, but to unite societies for specific purposes. Surely friendly rivalry does not of necessity mean absolute antagonism. Why a photographic atom, say, for example, in Leeds, should have no affinity for a similar atom in Bradford, passes my comprehension; and, if one ceased to exist, the one remaining would be not a whit the better, but probably worse. That these so-called conflicting atoms are not conflicting, but have an affinity and a cohesiveness, is proved by the fact that the societies of Yorkshire did unite for the purpose of an Exhibition, which was a pronounced success. The third point is not difficult to deal with. Mr. Warren knows that Bradford is entitled to three delegates, the same as any other society with a similar membership roll. A committee of eight discussed the provisional scheme, and decided to bring it before the Yorkshire societies. The Union being formed, this committee therefore ceased to exist. What



is meant by the twelve conflicting Bradford atoms, I know not; but, as Secretary of that Committee of eight, I can state, positively, they were unanimous that the advantages of a scheme of union were incalculable, and that it was worth a struggle in order to see if the thing was practicable. The last point I prefer not to enlarge upon—no one society is expected to give of its abundance without a *quid pro quo*.

To argue that individuals are conflicting atoms, and that societies are also conflicting atoms, is somewhat puzzling. An individual atom must have some affinity or coherence for other atoms or there could be no aggregated atoms in the shape of societies. To carry the analogy further is useless. Thanking you in anticipation, I am, yours, &c.

113, Chesham-street, Bradford.

EZRA CLOUGH.

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

RECEIVED.—T. M. (Newport); A. A. NOAKES; F. S.; H.; and others. In our next.

J. F. BENSON.—No; we do not keep such addresses.

ALFRED UNDERHILL.—The address is Great Windmill-street, W.

E. MOORE.—Yes; you have a legal claim in the circumstances mentioned. You can recover in the County Court.

A. H. (Cardiff).—We are much obliged to you for your letter, the information in which will probably be useful to us on a future occasion.

CROFTHORPE.—At the moment we can offer no suggestion on the lines you indicate, but we will keep your letter before us. By all means call here when you come to town.

PHOTOGRAPHER.—There is no analogous publication issued in France, or anywhere else. Better try the *Moniteur de la Photographie*, published at 51, Quai des Grandes Augustins, Paris.

A. M. Z.—It is recommended by authorities that in cases of over-exposure the bromide should be increased in greater proportion than with other developers. We, however, have had no personal experience on the precise point.

FRANK COGHIAN.—The only way of ascertaining if copyright is in existence is by making a search at Stationers' Hall. In the case you mention copyright has probably run out, but, for the sake of a shilling or two, you had better make sure.

LENS.—R. C. W. The most generally useful lens for an amateur "at a moderate price" is one of the rapid rectilinear type, and not the wide angle. For  $7\frac{1}{2} \times 5$  one of about nine-inch focus will be suitable, and for the quarter-plate size one of about five and a half or six inches focus.

LENS FOR STUDIO EIGHTEEN FEET LONG.—PROVINCE says: "Will you inform me what focus lens I shall require to take a full-length C.D.V. in a studio eighteen feet long?"—A lens of six inches equivalent focus will require from twelve to thirteen feet between camera and sitter, and that is about the longest focus lens that can be employed in so short a studio.

VARNISH.—ILEX says: "Will you inform me what stain or ingredient to add to photo shellac varnish (solvent meth. spirit) to make it a deep yellow, for coating glass, and leaving a yellow film?"—A little aurine, one of the coal-tar colours, added to the varnish will give it a very non-actinic tint. Most of the yellow coal-tar colours are soluble in alcohol and may be used.

COPY OF PORTRAIT.—MIDLAND. We are not surprised that the paper refuses to pay you anything. Why should it? The gentleman paid you for taking the portrait, and he sent it to the paper with permission to use it. You have no copyright in the portrait, therefore it would be no use for you to register it with a view to taking proceedings against the paper. Clearly the proprietors of the paper know the law on the subject better than you do.

OBSCURING GLASS.—P. S. M. says: "The outlook of my studio is very bad—a mews with stables and manure heaps—and I want to obscure the outlook, and do not want to go to the cost of reglazing with ground glass. I have tried coating the glass with Epsom salts, and that is all right when first put on, but in damp weather it is spoilt."—Coat the glass with thin starch or flour paste, to which a little whitening has been added, stippling it on with a brush.

PROTECTING INVENTION.—M. SCOTT. The only way to protect the invention is by a patent. Registration is of no use. A provisional protection for a year is 1*l.*, and a patent for four years 4*l.*—that is, if you take them out yourself. If you get the work done by a patent agent, his fees will be in addition. We should advise you to get provisional protection in the first instance; that will allow you nine months in which to complete the patent or to dispose of the invention if you choose to do so.

MANCHESTER.—1. Collodio-bromide emulsion may be obtained of Messrs. Penrose & Co., Upper Baker-street, Lloyd-square, E.C. Gelatino-bromide emulsion is not now an article of commerce. 2. Roughly from three to six dozen; but, of course, all depends on the thickness of the coating.

BACKING; AND MAGNESIUM FLASHLIGHT FORMULA.—X. Y. Z. says: "1. In your ALMANACK for 1899, the formula for backing (p. 1062), does it prevent halation? 2. Could you please give me a safe formula for magnesium flashlight powder?"—1. Yes. 2. The only really safe magnesium flashlight powder is simply the magnesium by itself, blown through a flame to cause its ignition. All the explosive mixtures containing such things as chlorate of potash, permanganate of potash, &c. are more or less dangerous—more rather than less.

STUDIO BLINDS, &c.—E. P. says: "1. Will you inform me what would be the best colour to have for studio blinds? My studio is 7 feet 9 inches to eaves, and 9 feet to ridge of roof. Two feet from end is board, 8 feet wide glass, which is rough rolled plate, light north. I have light grey linenette blinds now, but do not seem to be able to get much, if any, shadow on the face. 2. Can you also oblige me with the address of a manufacturer of the rackwork for studio stands?"—1. If sufficient shadow is not obtained with the blinds now in use, replace them by dark green window holland. 2. See the advertisements in the ALMANAC for 1899.

PREVENTION OF FRILLING.—P. M. N. says: "Kindly reply how to prevent frilling of films and coming off the glass. I use —. Unfortunately I lost a good order through it, as the gentleman I have taken is gone abroad. The film came off and expanded, and I could not save it."—If the plates be treated with formalin or with alum, it will prevent frilling, but we have never found the brand of plates named to require any such treatment. Had the expanded film been carefully transferred to alcohol, it would have gone back to its original dimensions, and could have been caught upon another plate, and then the negative might have been saved.

OWNERSHIP OF STUDIO.—EDMOND WALLIS writes: "I have put up a small studio in rear of my premises for photographing backgrounds in, and forgot to have anything relating to the ownership of it mentioned in the lease. It is built of matchboards, and stands on bricks. Does it become a removable tenant's fixture if I have it on wood blocks instead, or doesn't that matter if it is not let in the ground?"—We cannot say for certain; but we should say the studio could not be removed as a tenant's fixture, however it is fixed to the ground. The law is a little knotty on the point. For example, in the case of greenhouses, a nurseryman is allowed to remove his, but a private individual is not.

MATERIAL FOR SMALL BACKGROUNDS.—S. BOSEY writes: "I want some material for small backgrounds for sitters, heads and busts, upon which I can rapidly put in some shading or hatching to suit the sitter I am taking. Of course, I want the material to be of a suitable colour, as a light ground upon which I can sketch in with light or dark chalks, and to be inexpensive, as I shall mostly require a fresh background for each sitter."—We can suggest nothing better for the purpose than brown paper; indeed, it is difficult to conceive anything better. It may be had in almost endless length, and nearly five feet wide. It is known as carpet paper, and it may be had at any of the furnishing warehouses.

PHOTOGRAPHING A SILVER CUP.—G. THOMAS says: "I should be extremely obliged if you could give me any information as to photographing a silver cup, which is composed mostly of burnished silver. I enclose you a photo; you will see from that that the burnished parts come out black, and in the stem of the cup there is a great amount of reflection. The cup looks more like ebony than silver!"—Burnished silver is practically black, and should be so shown in the photograph, to distinguish it from the lighter portions. The photograph sent is under-exposed, and the reflections are due to imperfect lighting—all from the direct front. If the lighting had been more from the side and the negative better exposed, the photograph would have been a very good one.

WHITE SPOTS ON PRINTS.—ARGENT says: "Can you tell me what causes the yellow and white marks on the enclosed print? They do not appear till they have been mounted a few days. I use the Crossed Swords brand of paper, and sensitise it in a bath containing 50 grains of silver nitrate, floating it for three and a half minutes. After printing I wash the prints in six or seven changes of water, which take about ten minutes. I then salt them by putting a handful of salt in 2 quarts of water, and leave them in for about half a minute, or till they turn a bright red. I wash them again in about three changes of water, and tone in a bath composed of 2 quarts of water,  $\frac{1}{2}$  ounce of acetate of soda,  $\frac{1}{2}$  ounce of bicarbonate of soda, and enough gold to tone them in twelve to fifteen minutes. After toning, I wash them in two or three changes of water, and fix in a bath containing 3 ounces of hypo to the pint of water for ten or twelve minutes. After fixing, I transfer them to a bath containing a handful of salt to 2 quarts of water, and leave them for a few minutes, gradually letting fresh water in. I give them six or seven changes of water and leave them for the night. In the morning I wash them in running water for two hours, giving them between twelve and fourteen changes. They are then taken out and mounted with ordinary starch, and the marks appear in three or four days. The above refers to twelve or fourteen prints at a time. I have been printing in carbon for the last three or four weeks. Do you think the bicarbonate of potash from the sensitising bath has caused the marks by particles setting on the untuned prints?"—It is impossible to say the precise cause of the spots. They may be caused by particles of pernicious matter, such as bichromate of potash, or many other causes (see article on the subject on page 83 of our issue of the 10th inst.) The prolonged soaking of the prints in water is by no means conducive to their permanency, and may make them more susceptible to disturbing causes.



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## EX CATHEDRA.

THE annual ALMANAC of THE BRITISH JOURNAL OF PHOTOGRAPHY is always received in such a kindly spirit by the many thousands of readers, advertisers, and others interested in its publication, that we submit no apology for the insertion of this short reference to the manner in which the thirty-eighth yearly volume, issued last December, "went off," to use the technical phrase. It was not only by far the bulkiest of the series, numbering 1508 pages, but the edition of 20,500 has been practically exhausted in the shortest time on record, namely, in the month of February. Hitherto the process of exhaustion has continued to a much later period of the year. We anticipate that in a very few weeks copies of the 1899 ALMANAC may not be obtainable. One other source of gratification remains to us, namely, the pleasant words of appreciation which the volume provoked in the press. Never before has the ALMANAC met with such a sincerely and cordial reception at the hands of our *confrères*, whom we heartily thank for their help and encouragement.

THE first Traill-Taylor memorial lecture on "The Focometry of Lens Systems"—to give it a shorter title adopted by Mr. Dallmeyer in preference to the one originally selected—has just been issued, revised by the author, in pamphlet form. As an appendix, a description of the Dallmeyer focometer, with illustrative examples of the manner of its use, is also given. Many of our readers will doubtless avail themselves of the opportunity of possessing, in a separate form, this, the first important contribution to the study of optics that has been made by an English author for some years past.

\* \* \*

COPYRIGHT is a subject in which all photographers are vitally interested, and it is to be hoped therefore that not a single person who makes use of the camera will fail to devote some attention to certain efforts which it is proposed to make in the direction of amending or altering the law on the subject. These efforts have their origin amongst a number of artists who propose endeavouring to get a Bill before Parliament, the object of which is to amend the existing law of Copyright in so far as it affects paintings, engravings, sculpture, and allied works of art. Doubtless, very good reasons exist for agitating to secure better protection for the authors' rights and interests in such productions, but we are in no small measure surprised to note what the promoters of the Bill propose to do in regard to photographs. In the first place, the provisions of the Act of 1862 are so far ignored that photographs are separated from works of art (in the Act referred to, no distinction is made), while it is suggested that copyright in photographs, instead of, as at present, existing during life and seven years afterwards, should simply run for a period of thirty years.

\* \* \*

BOTH proposals with regard to photographs strike us as totally uncalled for. The Act of 1862 has, on the whole, worked well in the interests of photographers. On what grounds do the promoters of the new Bill suppose that less protection is needed for photographic copyright now than thirty-seven years ago, when it could not possibly have been foreseen how greatly photography was to grow and become a necessity of modern art and industry? To-day, photographic copyright assumes—nay, possesses—a value to many which can hardly be over-estimated, and yet it is seriously proposed to



reduce that value, to subject to a heavy discount the interest of a photographer in his work, notwithstanding that the introduction of photographic processes has already effected a considerable diminution in the value of that interest. It is to be hoped that, before further progress is made in finally drafting the Bill, representative photographers and photographic institutions will be heard in the matter, so that the rights of photographers will receive the fullest protection. We should have thought that the artists, before having got their Bill into type, would have sought counsel of members of a class who are so vitally interested in that measure. Fortunately, the Royal Photographic Society has appointed a committee to take action in the matter, and no time therefore will be lost in considering how the interests of photographic copyright are affected by the proposed Bill, which certainly should not be allowed to reach Parliament in its present shape.

\* \* \*

THE *West End*, the latest addition to illustrated weekly journalism, previously had a successful career of two years as a monthly. If the quality, get-up, and prosperous appearance of the first number of the paper, in its capacity of a rival to existing publications of the kind, afford grounds for anticipating the career that awaits it, we may confidently predict that the *West End* will secure a position second to none among those beautifully produced weekly illustrated papers which are at once the wonder and the delight of the public. The *West End* very largely relies upon phototypic blocks for its illustrations, and the thirty or more that are given in the first number are of a very high order of merit indeed; truly, nothing finer could be desired. The other artistic contents and the literary contributions are just sufficiently *fin-de-siècle* for readers "outside the movement." Printing and paper are of the best, and altogether the *West End*, which is published at Clun House, Surrey-street, Strand, W.C., makes a bold bid for the success which we have no doubt awaits it.

\* \* \*

OUT of a chatty letter we have received from our *confrère*, Mr. F. Dundas Todd, editor of the *Chicago Photo Beacon*, we take the following extracts, which will, doubtless, be of general interest: "I meant to write you some time ago to let you know that I much enjoyed your notice of your humble servant in a recent issue of THE BRITISH JOURNAL OF PHOTOGRAPHY. I especially wanted to get an erroneous idea out of your head. It was not THE BRITISH JOURNAL OF PHOTOGRAPHY I was aiming at, but — & — The former, or his satellite, writes with an air of patronising superiority that comes from rank ignorance of conditions on this side, and I would simply say this, that if the British photographer does not look out he will be out-distanced by his American cousin just as thoroughly as our mechanical friends have been licked by the American mechanic in the matter of tools. I did not get rid of the big pile of books I figured on last year, but I disposed of 40,000. The war at first knocked things into a cocked hat, and business lay dead for about ten weeks, otherwise I would have done much better; 1899 starts off splendidly, my January business being just double of '98, and Feb. keeps right up. It is probable I may be on your side early in the summer, and, if I do get across you may expect to see me at the Convention, not to teach your folk anything, but just to make notes—possibly to be printed. I send you a sample of my advertising matter, so that you may have some idea of how we push business here, and also learn

that we American publishers are nine-tenths business men and one-tenth editor. My advertising expenses last year exceeded 250%. Are you now catching a glimmering of conditions different from yours? It does amuse me often to read about cold-weather precautions in English publications. We have just finished up a cold spell here, of which I dare say you have heard a little. Look at these figures:—

Sunday morning..... 17° below zero.

Wednesday noon ..... 45° above „

62° difference.

How would your cold-weather precautions work at 17° below, or 26° below, as we had it on Thursday? It has got to be felt to be appreciated. The English people know absolutely nothing about how to decently heat a house, office, or workshop, and I often think how I used to shiver over an open fire, and think that that style of heating was perfection."

\* \* \*

By the courtesy of a friend we have received a batch of free-portrait literature emanating from the Parisian Artistic Photographic Enlargement Company, Limited, of 39, Rue de Constantinople, Paris, of which "R. Leroi" is manager. This Company sends out a coupon entitling the holder to a life-size portrait, value 1*l.*, delivered absolutely free of charge, if the coupon, *plus* a photograph, is sent back within fifteen days. You are very considerably told to "have no fear" that your photograph will be returned to you in good condition. The second document consists of a page and a half of testimonials, all emanating from the North of England. A third is Monsieur R. "Leroi's" letter, in which, after making the offer of a free portrait in the terms in which such philanthropic proposals are usually couched, the writer goes on to say: "In conclusion, we would beg to remind you that you will, no doubt, have already received similar offers from various so-called Artistic Portrait Societies in Paris, who offer you a portrait gratis, but, before you can obtain your portrait, they compel you to either purchase a frame or to remit 8*s.* Please do not confound this offer and our Association with such concerns. We do not only give you the portrait gratis, but we deliver same to your address absolutely free. In other words, our offer is that of a portrait, size 16 by 20 inches, mounted on Bristol, delivered at your own home in about thirty days after we receive your photograph, all without costing you a penny.' If M. "Leroi's" Company has nothing to do with the other Lutetian portrait societies, against which he is so good as to warn people, it is to be regretted that the style, get-up, and phraseology of his circular bear such a close resemblance to that sent out by Messrs. "Tanqueray," Messrs. "Schneider," and the other persevering knights of (photographic) industry at present located in Paris.

\* \* \*

WE are reminded of the imminent approach of spring by the receipt of Messrs. Marion's catalogue of their annual clearance sale, which lasts from March first to the tenth; of the ninety-six pages of that catalogue about half are devoted to photographic goods, amongst which accessories, sundries, shutters, tripods, printing frames, dishes, animatographs, X-ray apparatus, cameras, porcelain ware, lenses, finders, mounts, and many other items are listed in great variety. As in former years, the sale will, doubtless, attract great attention. Catalogues are obtainable free.



## FOCUSSING OCULARLY AND BY SCALE.

THE season for outdoor photography is now fast approaching, and we have already had inquiries from more than one novice, in effect, as to whether they should get hand cameras with fixed-focus lenses or adjustable ones? Of course the majority of our readers do not require to be told that there is no such thing as a fixed-focus lens, or that there ever can be one. There are, however, fixed-focus cameras, but they are hand cameras and mostly of the cheaper forms. Most of the better-class cameras are provided with a focussing arrangement with a scale, graduated, at which objects at different distances will be at their sharpest in the negative. Others, again, of the twin-lens type are usually arranged so that the focussing can be done visually.

Now, the question arises as to which of the two systems is the better in actual practice, i.e., focussing on a ground-glass screen, or relying on the focus as indicated on an accurately adjusted scale. If the latter, why is it not applicable to cameras of larger sizes than the usual hand cameras? It may as well here be mentioned that with very short-focus lenses, such as those used for pocket cameras, an adjustment is scarcely necessary in practice, as the aperture of the lenses rarely exceeds about  $f/10$ , and the focus more than three inches. Consequently all objects with such lenses, beyond about eight or nine feet, will be in good focus or with a lens of four inches focus, fourteen feet, and it is seldom that anything at less than these distances has to be taken with hand cameras. For that reason, with lenses of such short focal, a focussing arrangement is scarcely necessary. But the case is different when we come to deal with lenses of five and a half or six inches, such as are generally used on the better class of quarter-plate hand cameras, and which have the larger angular aperture  $f/5.6$  or  $f/8$ . With a lens of six inches focus and the former aperture there will be a marked difference in the focus of objects situated within, say, a distance of about forty-five feet, though beyond a little more than that all objects will be practically in good focus.

To the users of cameras of the fixed-focus type, even with the shortest-focus lenses, we would say, See for yourselves that the lenses are really fixed at their best foci, for several cases have come under our notice in which they have not been, and considerable improvement might be made in that respect. The same remark also applies to the adjustable cameras with scales; they also have not been correctly adjusted. Hence the best has not been made of the lens when these incorrect scales have been relied upon, indeed excellent lenses have shown only as second or third-rate ones. In many cases, with the cheaper cameras, no more care seems to be taken in the adjustment of the lenses than has been the case with the fixing of the finders. More than once we have called attention to this subject. Rarely do we find, even with costly cameras, that on the finders—vertical and horizontal—the centres of the images coincide with the centre of the ground glass, or the angles included by them correspond with that included by the lens.

The point here, however, is whether focussing by scale is preferable to ocularly focussing for each exposure, and, if so with hand cameras, why not with those of larger size? With small cameras, and a properly adjusted scale—and all depends upon that—it seems that this is the best way in practice, for it is doubtful in many cases, as for example in street scenes or photographing some interesting event, or exciting scene, if so good a focus is secured when it has to be quickly obtained,

visually, as by a rightly adjusted scale. The objection generally urged against focussing by scale is the difficulty of correctly judging the distances applying to the scale. That is, however, more imaginary than real. Most people can judge pretty well if the object be ten, twenty, or thirty feet away, and an error of a foot or two, either way, makes no material difference in the result. When we get beyond, say, twenty feet, with a five-inch focus lens the difference between that and infinity is quite a negligible quantity, particularly if the lens is used with a stop.

As to the convenience of the two systems there can be no question. Seeing that, will it not be, in many instances, equally the case with larger sizes—the whole plate or  $12 \times 10$  for example? In some cases, certainly yes; for example, in photographing dark and badly lighted interiors where the only chance of obtaining a focus is by tapers burnt at different parts of the building. Here an accurately adjusted scale that could be relied upon would not only be a great convenience, but often a better result would be secured. So it often would be in taking instantaneous pictures of moving objects, &c. On this point we have in our minds a series of boating pictures of large size,  $20 \times 16$  or thereabouts, taken with a lens of some thirty inches focus, that were obtained by this method alone. But a considerable time had been expended in carefully adjusting the scale on the camera beforehand, and it is obvious that that need be done when working with a lens of such focus. Also the distance of the different objects from the camera had to be pretty correctly estimated, as in this case they were. Some of these pictures, thus obtained, took a medal at the Royal and other exhibitions some years ago. There is, however, a difficulty in the way of the scale system which must not be overlooked, namely, when the swing back has to be brought into use, but that difficulty is not really an insurmountable one.

**Purification of Acetylene.**—Herr P. Wolff, in *Chemiker Zeitung*, has some very pertinent remarks upon this subject. He alludes to the continual publication of new methods of purification, having for their object the purification of the gas with the purpose of avoiding smoke when the gas is ignited. As a matter of fact, the production of smoke is a function of the burner, and not of gaseous impurities. The only impurity of moment is phosphoretted hydrogen, which Lunge and Cedercreutz have proposed to eliminate by the use of chloride of lime. Herr Wolff had previously noted that this method of purification resulted in the production of a series of small explosions, caused by the nitrogen of the ammonia present forming chloride of nitrogen. To prevent this effect, the ammonia should be got rid of, and this Herr Wolff states can be easily done by simply washing with water. Chloride of lime can safely absorb the phosphoretted hydrogen and the hydrochloric acid at one operation. So pure is the gas so treated that it only possesses a faint ethereal odour, and the warning smell is lost till it is slightly restored by passing the purified gas over a further quantity of carbide, which causes a slight quantity of crude acetylene to pass over and give a sufficient yet not strong odour to the whole. The pure gas is without action upon copper and its alloys, but a trace of impurities will quickly bring about a brown stain on polished bronze ornaments. These stains are said to be not, as is commonly stated, acetylide of copper, but phosphide.

**Low Temperatures and Light Action.**—Professor Dewar's experiments upon dry plates exposed to the low temperatures of liquefied oxygen will be in the memory of our readers; he showed that all chemical action of every sort ceased, and recently MM. A. & L. Lumière have presented a paper to the Paris Academy of Sciences, upon a somewhat similar topic. They state that a gelatino-bromide



plate, when immersed in liquid air, and subsequently exposed to light for a short period, gives, upon development, very little trace of deposit. If plates were dipped into the liquid, and then permitted to resume their normal condition and temperature, they retained all their properties. The experimenters did not find all light action arrested at the low temperature of liquid air; but their sensitiveness, under the conditions, was reduced several hundred times.

**Explosive Actinometers.**—Speaking of explosive nitrogen compounds, it may be noted that, at the last Chemical Society's meeting, a reading of a series of papers of nitrogen iodide, led to the President's remarking that nitrogen iodide had already been proposed for use as an actinometer by means of the results of the decomposition of that substance when light was allowed to fall upon it under suitable conditions.

**New Current Interrupter for Ruhmkorff Coils.**—Mr. A. A. C. Swinton draws attention in *Nature* to a new current interrupter invented by Dr. A. H. Wehnelt, of Charlottenberg, which Mr. Swinton considers to be by far the most important improvement in connexion with these coils that has been for many years introduced. The apparatus is of extreme simplicity, consisting merely of a glass vessel into which dip two electrodes. One of these is a plate of lead of considerable area; the other is a glass tube, through the end of which protrudes a short piece of platinum wire, sealed into the glass. The glass tube is open at the other end, and is filled with mercury, into which is dipped one of the wires from a source of continuous electric current. The glass tube is immersed in the acid, so that the platinum wire is some distance below the surface, and is within half an inch or so of the lead plate. No condenser is employed, the primary terminals of the coil being directly connected with the supply mains (100 volts) through the electrolytic cell, the positive current being arranged to pass through the cell from the platinum wire to the lead. On turning on the current, a rapidly intermittent arc is seen to take place in the vicinity of the platinum wire, apparently between the latter and the dilute acid. Judging from the loud hum, the frequency must be some hundreds per second. At the same time from the terminals of the secondary of the coil, placed some five or six inches apart, a perfect torrent of sparks takes place. The effect is, in fact, very similar to that produced with a Tesla high-frequency coil, but is much more constant and much less diffuse. With regard to the photographic action of such discharges, we should require to have more information before we could form a decision as to whether the innovation is of value or not, for it is well known to experts that for the greatest penetration of the X rays to be obtained it is by no means necessary to have rapid intermittence of current. Indeed, while for diagnosis with the fluorescent screen rapid interruption may be useful, a current of such slow breaks that each one may be counted, and that, in consequence, will not bend the platinum reflector of the Crookes' tube, will give great photographic penetration. These varied effects are well shown in the mercury break sold by Messrs. Isenthal & Potzler, by which the current is under very complete control.

#### ON THINGS IN GENERAL.

WE all respect the utterances of so ardent and experienced a photographic veteran as M. Léon Vidal but whether we are to follow him in his onslaught against the Paris Municipal Council, for voting the immense sum of sixteen hundred pounds for the purpose of having the pictures of Hotel-de-Ville reproduced by engraving, is matter of doubt. "There is nothing like leather," we know of old, still I hope I shall not be considered a traitor to the art if I venture to raise a protest against the indiscriminate reproduction, by photogravure, of all and sundry paintings it is wished to multiply. When one has said that we obtain faithful reproduction by its means, we have said all and more than all. Tone and values are too frequently lost sight of; verisimilitude of outline, it is true, we get; but too frequently that is all, and the more nearly we approach the effect of the original, the

more do we owe to the clever manipulation of the expert handicraftsman, and the less to pure photographic process. We get some good photogravures, but they are the exception; the rule is a something of a nondescript nature, "neither fish, flesh, fowl, nor good red herring." To compare an average engraving with a photogravure is to compare living human flesh with Madame Tussaud's effigies.

That was an excellent discussion at the London and Provincial Photographic Association upon Mr. Welford's paper on "Photographic Society Life." The proper key-note was struck in the references to beginners and their work. Mr. Philip Everitt said, speaking of them, that the old custom of pouncing upon a raw beginner and holding up his work to ridicule was, happily, dying out. Well, this is only half true. Mr. Mackie's remarks were more to the point when he said that the treatment accorded to beginners was to a large extent dependent upon the attitude they assumed. To show a bad result for admiration was a sure means to invite ridicule; but he thought a beginner who brought forward his work with a view to acquiring better knowledge stood in no fear of such treatment. Quite true, Mr. Mackie; but does such a *rara avis* exist as the modest beginner? My experience of the race is that, when they have had a camera for, say, a week's time, they know absolutely everything it is possible to know. Time was when, in conversation with such a one, I would spend a good amount of time in explaining things, perhaps putting him in possession of some little tip, of which, or its use, he had previously been absolutely ignorant. And how would he take my aid? Not like Mr. Mackie's modest learner, anxious for information; no, he would merely reply, "Oh, yes, that is a capital plan," with an air as though he absorbed the knowledge with his mother's milk. He is ten times worse than an amateur painter, and we all know him. I was once shown a portrait painted (life size) in water colours by one of the latter. "What do you think of that?" he said. "I've just been to the Royal Academy, and I didn't see a single portrait on the walls that I liked so well." I assure my readers I am not jesting. My only resource was to fall back upon technique, and suggest that I thought he might get even still better results if he did not use Prussian blue (!) in his flesh shadows. A week after, he came to me again and said how much improved his work was for my tip. Now, no photographic amateur that I ever came across would have admitted that; he would have assumed that he threw all his Prussian blue in the fire such time as he used to place his sister's wax doll there. I don't really think, after all, there is such a thing as a photographic beginner in the sense implied in the discussion, unless it is a man who has just looked in on his return from his first photographic purchase.

I was much interested in Dr. Steinheil's paper upon the use of the tele-photo objective for astronomical purposes, wherein he shows the uselessness of the instrument for all except solar work. This will, perhaps, be a disappointment to many, but it is well to place on record all such limitations, so as to give a practical turn to the work of the many enthusiastic photographic workers with some photographic knowledge, and prevent their wasting time merely on the impracticable. I know a very clever photographer, equally skilful with his equatorial, who was on the point of buying a large single achromatic photographic lens to work at *f*-8 for fine stellar photography. He could not at once understand that a lens made to embrace an angle of at least twenty or thirty degrees could not be expected to give definition equal to that from a telescope objective corrected only to a tenth part or so of such aperture. I often wonder, seeing the *modus operandi* has been so often and well described in this JOURNAL, some one possessed of a good rapid rectilinear or anastigmatic lens of a couple of feet focus does not show what can be done by taking a snap-shot of the moon, and enlarging the small negative so taken. A very fair picture indeed could be so obtainable, and, indeed, a stereoscopic view of the luminary, an inch or inch and a half in diameter, might be produced by taking two views—one an hour after the other. Parallax equal to that from the two eyes directed upon an object ten or twenty feet distant would be given. The word parallax calls to mind the well-known lecturer who some years ago used to lecture in all the large towns on the subject of the rotundity of the earth. He was a clever man, and defended his position, that the earth was flat, with wonderful skill



and subtlety and plausible casuistry. One of his arguments in favour of his explanation of the whole solar system was that the moon gave off no heat, but, indeed, its rays were the reverse of hot. His arguments would have had an unfortunate termination if Lord Rosse's recent lecture at the Camera Club, showing how he had measured the heat of the moon's radiation had been delivered at the time. But the greatest of men are caught tripping sometimes. For example, I read the other day that "Mr. Dallmeyer, in a recent letter, pointed out to us that when a lens is focussed for infinity the focus of a negative lens required to bring any object into sharp focus without moving the plate is simply the distance of the object itself. This is a convenient little rule to bear in mind in such cases." I don't believe Mr. Dallmeyer ever wrote such a thing. To use a negative lens to cause the focus set for parallel rays to be correct for near objects is obviously absurd, and, further, to believe that he ever suggested that one and the same correcting lens was, under such circumstance, equally applicable whatever the focus of the original lens, is simply incredible.

Mr. Burrill's paper, read at the Leeds Camera Club the other day, was an interesting contribution to the knowledge of materials, but he went rather too far in his recommendations. Who, for instance, uses distilled water for making up his developing solutions? Yet Mr. Burrill laid stress upon the necessity of using pure water. Possibly, however, the abstract of his paper may not quite give the true sense of his words, and that pure, i.e., such as one could only in practice get in distilled water, was not intended. In any case, it may be safely asserted that distilled water is not necessary for compounding a developer with.

I noted at the Photographic Club the other day some one asked how to remove the yellow stain sometimes got with the ferricyanide reducer, the general opinion being that they could not be removed. In a sense that is so; but a five per cent. solution of citric acid will take them out, only, however, to return again if sufficient washing to remove the acid be given. One word more about the various toning methods of old. I find "A. W." writing that the phosphate of soda in toning was only introduced after the alkaline system was adopted—the carbonate, acetate, citrate, borax, *et hoc genus omne*. Now, it is not generally known that one of the later editions of Hardwich gave a method of compounding a citrate of soda toning bath of most excellent quality. This attracted virtually no attention, and, when the "alkaline gold toning"—carbonate of soda—was introduced, it was never heard of. I believe I am correct in saying that the next variation was the phosphate by Mr. Maxwell Lyte, and later came the acetate fathered by PAbbe Laborde. I am writing from memory, but I think correctly.

FREE LANCE.

#### FERRO-GALLIC COPYING PAPER.

THIS method of printing is due to Messrs. Schering, of Berlin. From a drawing in black lines upon a white ground, it gives, after exposure to light and development in water, a copy also having black lines upon a white ground.

Such positive copying paper, say Messrs. Schering, is produced by coating in the dark, by means of a rotating roller or other suitable apparatus, the ordinary so-called ferro-gallic paper (which is a paper containing ferric chloride and tartaric acid, and is usually developed by gallic acid) produced according to any of the known methods, either upon the side sensitive to light, or upon the reverse side, with the solution of a mixture of a body colouring iron oxide salts, for example, gallic acid, tannin, pyrogallol, and the like, and of an acid which prevents the premature formation of a dyestuff between the developer (gallic acid) and the light-sensitive salt (ferric salt), and does not itself darken the ferric salt in a suitable solvent, which does not dissolve gelatine and rubber, for example, alcohol or ether, and thereupon quickly drying.

The paper so produced is, in the usual manner, placed in the light under a drawing in a copying frame. After exposure, the paper is washed with a jet of pure water or placed in a vessel with a quantity of pure water, whereupon the drawing at once comes out black upon a white ground.

The preparation of the ferro-gallic paper with the solution of a mixture of gallic acid and the like, and of an acid which prevents the premature formation of a dyestuff between the developer (gallic acid) and the light-sensitive salt (ferric salt) and does not itself darken the ferric salt, which does not darken iron oxide salts, has many advantages. For instance, gallic acid alone in alcoholic solution gives to the ferro-gallic

paper treated therewith a black violet discolouration, which renders the paper unusable, this is absolutely prevented by the presence of the acid; the iron salt contained in the ferro-gallic paper remains, on the contrary, unaltered. Gallic acid alone, which, up to the present, has been rubbed upon the paper in a pulverised form, diminishes its sensitiveness to a considerable extent, by the use of a mixture of bodies darkening iron oxide salts and suitable acids; on the contrary, the sensitiveness of the paper is not only not prejudicially influenced but rather increased. Further, the development of the copies in water by the use of powdered gallic acid takes a long time, for the gallic acid is difficultly soluble in water, and the blackening of the iron salt is thereby retarded.

Dissolved gallic acid, on the contrary, operates, on account of its fine division, almost immediately, so that the development of a photogenic copy only takes a short time.

The presence of such an acid has also a purifying action upon the white ground of the paper, so that photogenic copies are obtained of much purer white.

To make positive photogenic copying paper producing violet lines upon a white ground, the following may be used.

Ordinary positive copying paper, the so-called ferro-gallic paper, is coated with a solution of—

Gallic acid .....	150 to 200 grammes.
Tartaric acid .....	50 „ 80 „
In alcohol .....	1000 c. c.

Instead of gallic acid any other salt, in suitable quantities, rendering iron oxide salt dark—for example, pyrogallol, tannin, and the like—may be used; instead of tartaric acid, citric acid, oxalic acid, anhydrous acetic acid, alcoholic, hydrochloric acid, or other acid not darkening iron oxide salts may be used; instead of alcohol, any other solvent capable of dissolving the before-mentioned substances and acids in sufficient quantities, which, however, leave the substances contained in the ferro-gallic paper unaltered, as, for example, ether, amyl-alcohol, acetone, methyl-alcohol, and the like may be used.

By a suitable choice of the bodies which colour iron oxide salts different shades of black, as also other colours, may be obtained.

#### ALBUMEN AND GELATINE PAPERS.

IT is now some time since albumen was superseded by gelatine in the preparation of photographic printing papers. Its rapid adoption and almost universal use in place of albumen, that for so many years had held its own without a rival, indicated that there was some deficiency in the albumen surface that workers were anxious to remedy. Gelatine, offering the desired immunity, was received, so to say, with open arms. It may be pertinent to ask if the gelatine has been found all that was hoped for, and so superior to the albumen it has, in a measure, supplanted, that the older process may be considered nearly obsolete, or in a fair way to becoming so.

Two serious charges were made against albumen: one that the prints so soon faded, and that the surface was not so perfect as could be desired. I fancy the beautifully even and grainless surface of the gelatine paper was the chief factor for its undoubted popularity; as to its superior permanence, it is a matter of considerable doubt if it is in any way superior, or even as good, as albumen. I think we may safely say a carelessly prepared gelatine print is very much more fugitive than one badly prepared on albumen; but perhaps fugitiveness, in many instances, is a blessing in disguise. It is not, however, fading that is the worst quality, but rather the dirty, sickly appearance, a yellowing of the whites of the print, that imperfect preparation generally induces, and that at an early date, in many instances even before they are washed and dried. The familiar P.O.P., which has in so many instances taken the place of albumen, and is the only kind of printing-out process known to a great proportion of amateurs, possesses qualities both superior and inferior to albumen. If extreme glossiness and the possibility of making fair or passable prints from poor, thin, over-exposed negatives were the principal objects, P.O.P. would undoubtedly be a long way ahead; but, given a negative of good quality, the results on an albumen surface would be more pleasant to look at, and more than equal its rival in artistic effect.

Unfortunately, owing to careless preparation in one or other parts of the process, many albumen prints look crude and deficient in delicate nuances of tone, that are beautifully apparent on the negative; but this is not the fault of the process, but of carrying it out, and depends not on any single, but on every, part of its preparation—printing, toning, fixing, and washing, any one of which badly or injudiciously done will put its mark on the finished picture; whereas with gelatine the print may be bad, but the half or more delicate tones will not suffer in anything like the same proportion; there is, in fact, an amount of half-tone, some of which might be well spared. The amateur, as a rule, looks for a method of working by which all trouble is minimised, even to adopting that abomination, the toning and fixing bath in one solution, that will, unfortunately, produce a print pretty enough in the first instance, but many times more fugitive than the worst albumen print that ever was made, and one that in a very short time becomes yellow and patchy. In looking over a large number of mixed prints on albumen and gelatine respec-



tively, I was struck with the deterioration that had taken place both in brilliancy and colour in the gelatine prints in the course of four or five years, in the colour especially.

Albumen prints ten or fifteen years old were brilliant in comparison, and in every case superior to the gelatine ones—in fact, many showed no signs of any alteration, and were as good as when first printed. That could not be said of any one of the gelatine when only a couple of years had passed over them and they had been closed in a folio nearly all the time. It may be said care was taken in preparing all these prints, so it was not from careless preparation, but evidently from faults inherent to the process. The usual sulphocyanide toning bath was used in all cases, and fresh hyposulphite fixing solution more than sufficient for the number of prints prepared at a time, with a thorough and careful washing afterwards; and yet the prints had become wofully shabby, which term expresses just what they were. When these are the results with careful preparation, what is more than probable will take place with carelessly prepared ones in a few months is easy to imagine. When we contrast the rough, slap-dash way in which thousands of albumen prints were made—fixing bath black with constant use, toning that scientific opinion would attribute to sulphur not to gold, and washing, well, a dip and a swill and little else—and yet they have lasted, probably rather yellow in the lights, but many of them fairly strong images after dozens of years, and quite copyable, if there was any necessity of perpetuating the image, gelatine prints, it is safe to say, would have had the decency to pass out of existence altogether in a fraction of the time.

But it is not the permanency of prints, but rather the appearance of them, to which I desire to draw attention. The charge has been frequently brought against albumen paper that it fails to produce the delicate detail there is on the negative, which charge is frequently correct, but not so when the process is blamed; it is the carrying out of the process that should be found fault with. Provided the paper is good as a foundation, over the preparation of which, in a general way, the photographer has no control; but, given a well albumenised paper and proper attention paid to the different processes it has to undergo, no other paper will give more satisfactory results in this respect, combined with brilliance and delicacy. Care should be specially given to depth of printing, condition of toning bath, and freshness and strength of the fixing solution, and, finally, to the length of time in the washing water. This latter condition is most important as affecting the *brilliance* of the print. All large producers must have noticed it. In course of business, prints are frequently left washing from Saturday night to Monday morning, with the result that Monday's prints are always duller than those prepared in the rest of the week that have only had one night's washing; but, if the one night in the water was curtailed to one hour, there would be a wonderful gain in brightness; energetic washing for a short time, if properly done, even for half an hour, not only leaves a more brilliant but more permanent result. The long-continued action of water sets up incipient decomposition with all its induced faults, yellowing, fading, *et id genus omne*. In the first place, let the printing be done in good diffused light to a proper depth; here, at any rate, we have all the detail there is in the negative. Afterwards come those processes that, improperly performed, destroy it. The toning bath being a little out of condition may dissolve the more delicate tints, and the fixing bath may be of the wrong strength or temperature, and do the same. Between them, the print, although brilliant, is deficient in delicate detail, and the process is blamed for injudicious manipulation on part of the worker. I cannot help but think that, after a time, albumen will once more be taken into favour, unless some other process is introduced that may be at present in the womb of futurity.

In this article I am merely comparing the ordinary glossy P.O.P. with albumen paper as used for the bulk of general work. Of course, with platinotypes and other matt-surface papers, for artistic effect albumen is not in it. Some of the modern papers and a good negative leave nothing to be desired for artistic effect judged by the highest standards. From very early days there has been a desire to have such prints, prints that would be brilliant and delicate without gloss, but it is only of late years that we have been able to do so. Many attempts were made at matt-surface prints, but they never seemed to be appreciated; possibly they were not sufficiently good. The majority of them were produced by floating ordinary albumen paper on the back and printing on the back, or by the use of plain salted paper. Providing a pleasant colour could be had—and that was not easy—when finished they had a wretched sunk-in appearance, although in the washing water they looked exceedingly nice. The effect of a large print on Whatman's drawing paper salted was particularly good when wet, but, like the rest, on drying, detail went out of the shadows, and a more or less sunk-in appearance supervened. With all such surfaces it was necessary to use a very strong negative; a soft, delicate one was useless. So, to begin with, getting detail in the shadows was severely handicapped. The crowd would, however, have none of it, so the photographer, who had to consider his profits, stuck to shine and vulgarity. How our leading portraitists of those days—William, for instance—would have appreciated our modern matt surfaces one can well imagine. His well-managed vignette heads would have further added to the estimation in which he was held for this particular class of work, and the charming productions of the leading men in Paris, Vienna, and Berlin would have been more charming. I

am, however, afraid it will be a long time before the public is drilled into a frame of mind to like matt rather than glossy prints, although the most appreciated pictures at our exhibitions are made on it.

What fascination a print of moderate size, say, whole-plate, with a surface like looking glass, can have, I am at a loss to divine; but, at the same time, I must confess to a liking for very small prints on a bright surface, where it is important to show the smallest detail clear and distinctly, but beyond this their very shiny surfaces have a commonplace vulgar effect. A smooth surface is unobjectionable, and must not be confounded with a shining one, which is a different thing altogether. Complaints were made of the detail in the shadows not showing sufficiently on albumenised paper, and the manufacturers have gradually contrived to so prepare it that the image remains mostly on the surface, and the gloss is better than formerly, and certainly shadow detail is improved. It has also had the effect of preventing its being used as formerly by floating and printing on the back when a matt surface was required, the salting not penetrating into the body of the paper. This is, however, now a matter of little importance, other matt-surface papers being readily available, and much more suitable than the makeshift plan we had formerly to adopt. When detail in the shadows requires accentuating on albumen paper, waxing the print will improve them without adding much gloss, and incidentally will have the effect of protecting them against atmospheric action to a considerable degree.

One great advantage P.O.P. has over albumen, in the eyes of the small consumers, is its keeping qualities, which are superior to albumen papers even when purchased ready-sensitised. Albumen paper will, in a time insufficient to cause discolouration, tone badly, whereas the P.O.P. does not alter in this particular whilst it remains white; either, however, keep very well with proper storage. Home-sensitised albumen paper much more readily deteriorates, especially in hot weather, unless special precautions are used to preserve it, than which nothing is more effective than superposing a sheet of carbonated paper upon the face of each sheet of sensitised paper, and keeping under pressure until required for use, and then backing it up in the printing frame also with the carbonated paper, in fact keeping it in contact with it until ready for washing. Albumen paper is also more pleasant to handle throughout the different processes, and very much less liable to get damaged, which should be considered in its favour. Most ready-sensitised albumen papers are preserved with acid, and acid in the toning bath invariably upsets it; the precaution of passing the prints through a weak solution of carbonate of soda before toning should be invariably practised, of course washing off the soda before toning, then much of the difficulty of getting good coloured prints would vanish. Again, the adaptability of albumen paper to all qualities of negatives is distinctly in its favour, except, as I have remarked, from thin, weak, or foggy negatives; but, whatever process is adopted, a good negative is the foundation of good prints. EDWARD DUNMORE.

#### A NEW SYSTEM OF FILM PHOTOGRAPHY.

MESSRS. MOH, HESERIEL, AND GRÜNEWALD, of Berlin, the authors of this invention, point out that a sensitised film may be exposed in the known manner, developed, fixed, and washed as usual, and then strengthened, that is to say, rendered thicker, with a gelatine film by pressing the two films together in a moist condition. There is thus obtained a strengthened negative sheet or film which may be treated like any other negative sheet, but can be copied from both sides with the same sharpness. The photographic image is produced in the camera upon an improved negative paper, which we will now describe. This negative paper comprises a suitable sheet of paper as a carrier for the sensitised film, which film consists in turn of three different films, viz.:

- (1.) A rubber film, which rests directly on the paper to which it adheres.
- (2.) A collodion film intimately united to the rubber film.
- (3.) An upper gelatine film as a carrier for the sensitising material.

These three films together constitute the negative sheet or film, of which the paper serves as the carrier. The negative paper thus constituted is exposed to light in the camera.

In the following description the combination of the negative sheet or film with the paper will always be referred to as "the negative paper."

After the negative paper has been exposed in the camera, developed, fixed, and washed, it is dried, and it then possesses the property of allowing the negative film to be stripped from the paper backing. The rubber film adheres sufficiently firmly to the paper to permit the various operations of developing, washing, and so on, yet not so firmly as to prevent the stripping off of the sheet; a smooth and easy removal of the negative film from the paper is thus possible. The negative sheet thus obtained is rather thin and liable to pucker or form wrinkles, which is a hindrance in copying. In order to remedy this drawback, the negative sheet is preferably strengthened, *i.e.*, rendered thicker. For this purpose a gelatine paper of similar constitution to the negative paper above described, but with this difference, that its gelatine layer contains no sensitising material, is immersed in water and united to the original negative while this is still upon its paper backing, so that both gelatine films adhere to each other. The two negative papers are then pressed into intimate contact by rolling or other suitable operation, and the resulting



sheet is hung up to dry. After drying, the two paper-backing sheets between which the strengthened negative film is contained may be stripped off, and a stronger, thicker, and smooth negative film is thus obtained which does not roll up and can be copied from both sides.

Besides the strengthening effect referred to, a further useful effect is produced by the employment of an adherent sheet as just described. The rubber film of the second or strengthening negative paper, which rubber film is in direct contact with the paper, receives an impression of the grain of the paper. It is thus possible by choosing a suitable paper to impart any desired grain to this rubber film. The grain thus imparted to the rubber film may thus serve as a substitute, either wholly or partially, for retouching, since the rays of light are dispersed and distributed in copying by the grain. Inequalities or ruggedness of the image or picture are thus suppressed by means of the dispersion of the rays of light by the grain without loss of any of the characteristics of the picture. The sheet of different grain secured upon the original or sensitised sheet thus acts as a substitute for the slow and tedious operation of retouching the negative. With a little easy touching up, results may be obtained equal to those of artistic photography and such as have hitherto only been obtained by tiresome and tedious labour. It is evident that the strengthening film must be selected in varying thickness according to the size of work. It is further obvious that for a landscape a strengthening film with little or no grain should be employed. In the case of portraits the coarseness of the grain would increase with the size of the head in order to obtain the right effect.

The employment of the negative paper herein described for the production of negatives obviates the drawback occasioned by the necessity of rendering the negative to be copied transparent with oil which has hitherto existed because, according to the present invention, the paper backing is stripped from the negative sheet and is no longer present when the copying is effected. A great improvement as regards the strengthening, i.e., the thickening of the negative sheet, is that the two moist gelatine films, which have been smoothly and completely united to their backing sheets prior to pressing them together, return to their original size after pressing, regularly and without forming blisters or turning or curling over; a completely flat sheet is the result. A further advantage is that the negative sheet is completely protected during drying from dust and dirt by means of the superposed paper.

#### THE LIPPMANN PROCESS.

By the courtesy of Messrs. Fuerst Brothers we have been favoured with the following directions for taking photographs in colours, communicated by Professor Lippmann, the author of the process, to the Société Française de Photographie:

Dissolve 4 grammes of gelatine in 100 grammes of water; add 0.53 gramme bromide of potassium. For orthochromatising, add about 6 c.c. of alcoholic cyanine solution (1:500), and 3 c.c. of alcoholic solution quinal-in-red (1:500).

After having mixed the above ingredients and reduced the compound to a temperature below 40° C., add, in a dark room, 0.75 grain dry-powdered nitrate of silver, and stir for a minute or two until dissolved. Filter through glass wool; pour it over the glass plates, which have been warmed, in the same way as collodion.

Let the plates cool on a flat slab of very cold marble, wet each plate with alcohol before washing, then wash for half an hour, drain and dry it. The plates are then ready, and can be kept for a long time.

Before use, moisten the sensitive emulsion with the following solution:—

Alcohol, absolute .....	100 grammes.
Nitrate of silver .....	0.5 gramme.
Acetic acid, glacial .....	0.5 "

Shake and dry. The plate thus manipulated increases its sensitiveness, but must be used the same day.

Expose for about two minutes in sunlight before a Zeiss 6.5 lens.

#### DEVELOPMENT.

Any developer may be used—amido, eikonogen, &c. Perhaps the best effect is obtained by MM. Lumière's developer:—

I.	
Water .....	100 grammes.
Pyrogallie acid .....	1 gramme.

II.	
Water .....	100 "
Bromide of potassium .....	10 "

III.	
Caustic ammonia .....	
Density 0.960 .....	

For developing take—

Solution I. ....	10 grammes.
Solution II. ....	15 "
Solution III. ....	5 "
Water .....	70 "

It seems to be more advantageous to develop little and to intensify with bichloride of mercury and with amidol.

One can also develop very well with a dilute solution of ammoniacal protoclauride of copper.

For fixing after intensification use cyanide of potassium.

#### THE JOYS AND SORROWS OF PHOTOGRAPHY.

BEFORE the Leeds Camera Club, on Wednesday, February 22, "The Joys and Sorrows of Photography" was the subject of a most humorous and instructive lecture by Mr. E. P. Newstead ("Peter Elland," of the *Junior Photographer*), who in the course of his remarks said variety was the spice of life, and the photographer got it, for, whether in cycling, footballing, fishing, or any other pastime, the gentle art of photography exceeded all. It was a great joy to go abroad in bright weather, and find plenty of good subjects; the sorrow came in when all your pet subjects were found spoiled, either with being wrapped in newspapers, or perchance from broken negatives. To go to the seaside and bring back mementoes of your holidays, with brilliant light, what a number of exposures you can get! But, if it rains all the time, then the sorrows come in. The fairest craft may be photographed with the sea in its calm mood, and further inland the sheep grazing quietly amidst the graves in some old village churchyard, and their reproductions would be things of beauty and joys for ever; but on developing, if you found (as often photographers do) the little ships and the little sheep on the same plate—well, words could not express it; the sorrows again came in. The hand camera secured you many interesting records of Jubilee processions, &c., and it was very disappointing to find at the critical moment a man had passed to catch his train, or something else had completely covered all your view. Again, in portraiture, how often it occurs that your sitters will be frivolous; you want expression, and you talk to them seriously. The result is another of your sorrows; you get an expression of a different kind. Children make capital subjects; they compose so easily, and with care you can get a pretty joy, which you can call "Watching for Father," &c.; but, when the child's white blouse is so mixed up with the white wall at the back that you cannot tell a nice little boy from the wall, then the subject is a sorrow which would form a good *Tit Bits* puzzle. One of the joys is the fact of your being able to visit foreign places, and on your return lecture upon them; and you bring back many slides, with a map and a stick, you rattle off a lot of outlandish names, and you are considered a great traveller; sorrows, however, are apt to crop up when some one of your audience, who may have lived there is inclined to ask you awkward questions; and your slide of *Omar's Tomb* (which has got in some way by accident) is pointed out as being really some old mosque or other, a few thousand miles farther away. There are many things to do, and there are many more to avoid doing, and the photographer, to succeed, must go through great tribulation; but the art is free from sameness, and the lecturer did not think anybody would be deterred, for, on the whole, the joys outweigh the sorrows, though it may be beyond the power of man to ever say with certainty whether his negatives will produce fine results or exactly the reverse.

#### PERSISTENCE OF VISION AND RAPID VISUAL SIGNALLING.

At the United Service Institute last month, Mr. E. S. Bruce, M.A., delivered a lecture on "The Relation of Persistence of Vision to Modern Rapid Visual Signalling." Lieut.-General Sir Andrew Clarke, G.C.M.G., presided. Mr. Bruce said it had been his privilege to add another instrument to the list of those devised for illustrating persistence of vision. The instrument, which he called the aerial graphoscope, while it showed the general effects of persistence of vision in a striking manner, so that a whole audience could see them, carried its penetrative qualities of instruction further than the old instruments designed to illustrate the phenomenon; for instance, it appeared to be the only instrument which showed the difference in intensity between the real image and the incidental image, and the gradual fading from the retina of incidental images. It also formed a most delicate test of the exact duration of persistence of vision on the individual retina, and it was in this second capacity that it applied to the relation of persistence of vision to modern rapid visual signalling. The vital principle of the instrument was a narrow lath of wood painted white in front, with a grey centre gradually diminishing in shade to white. This lath could be rapidly revolved at its centre by means of a multiplying wheel, or, if preferred, by an electric motor. On the lath he threw a small portion of a magic-lantern picture. When the lath was revolved rapidly, they saw the whole picture before them apparently in space, the explanation being, that as the lath revolved it received the different parts of the picture in turn. Owing to the fact that the retina of the eye retained for a short time any impression presented to it, the various portions had not time to fade before the whole picture had been successively projected on to the lath. The exact time that the persistent image remained on the retina varied with the intensity of the illumination with which objects were perceived, and with the sensitiveness of the individual retina. Probably also the perception of persistence varied with the sensitiveness of that complex mechanism which connected the rods



and cones of the retina with the grey matter of the brain. It is conceivable, too, that the brain itself had a part in determining the time of persistence. By means of actual tests with the aerial graphoscope, he had found that the same person could have a very different capacity of persistence of vision at different times of the day, according to the circumstances under which he was placed; for instance, within a few minutes his capacity of persistence of vision showed different durations for objects viewed under the light of different colours, or varied after a few minutes' violent physical exercise. The apparatus promised to be useful, not only in physiological laboratories, but in schools of army and navy signalling, as a means of testing the retinas of would-be signallers as to their capacity of persistence of vision. It would seem that bodily fatigue tended to prolong persistence of vision, which, he believed, was the tendency of illness. A light inside a signaller's lantern was visible, through persistence of vision, when the shutter obscured the actual light from reaching the eye. In reading the signals the signaller was discriminating between real and incidental images, a rather delicate operation, for the difference between real and incidental images was one of degree of illumination. It seemed evident that the signaller's sharp reading of dot and dash would depend upon the persisting capacity of his retina, and that a good signaller was likely to be one whose persistence of vision was abnormally low. The possible modification of a signaller's capacity for persistence of vision after fatigue might explain unexpected deficiencies in signalling which may have been in the past ascribed to indolence or carelessness on the part of an individual. Since signalling with flags was more fatiguing than signalling with lantern or heliograph, the former method of signalling would seem to tend to diminish the competency of the retina sooner than the latter. He hoped that those in authority would think the method of testing for persistence of vision worth a trial. Colonel Keyser said there was a great deal in Mr. Bruce's system. It was heart-breaking work for an instructor in signalling to find that in some cases all his labours had been thrown away. The men might have worked hard and done their best, but some of them had not got the quality of sight for the work, and therefore failed. Perhaps it would be useful to send men to the hospital to have their sight tested before they were allowed to join a class for signalling.

#### AT THE CAMERA CLUB.

THE lecture given on Monday, last week, by Mr. Horace W. Monckton, on "Glaciers and Flords in the Bergen District of Norway," stands out from the usual run of tourist lectures, in that it dealt with the Norwegian scenery from a distinctly geological point of view. Many persons have pointed out how valuable are photographic records of geological action, but the labourers in that particular field are few, and it is seldom, consequently, that we see a good photographic illustration of the earth's movements in past times. That this is the case will be at once conceded if we glance at any modern text-book of geology, when we shall find that sectional views of the earth's crust are invariably presented, not by photographs, but by outline drawings. All this will, of course, be altered in the future, but Mr. Monckton's pictures show us that it could be done now.

Although it was not pretended that the pictures had a higher aim than scientific illustrations, some of them had high artistic value as well, and elicited much applause from a rather critical audience; but, they gave the idea that the original negatives would have afforded better transparencies in more experienced hands, a not uncommon thing with amateur lecturers who prepare their own slides.

Nature's operations have been upon so grand a scale in Norway that mountains and valleys, streams and waterfalls, generally looked dwarfed in a photograph, but Mr. Monckton has successfully endeavoured to avoid this by a happy choice in the point of view, and by managing to get foreground contrast. He was able, by his pictures, to trace the formation of a valley, and to illustrate how, in ancient times, that valley was filled up by ice, and how, by glacier action, rocks, stones, and *débris* generally, were carried from afar to form a dam to the land-locked water in after-years.

We were also enabled to watch the progress of a modern glacier, fed by mountain snow, and terminating in vertical cliffs of ice, pierced in one case by a magnificent cave. Such an ice cave is not, however, of annual occurrence in the same situation, but is a freak of nature which may appear one year and be absent the next.

Other photographs showed how a lake might be gradually filled up by the *détritus* from decomposed rocks around, and how below the steep sides of a perpendicular cliff by such degradation would form a huge talus, or mound of earth. In other cases we saw long trails or *scree*s of loose blocks which have been split off by the action of frost and heat from the rocky heights above.

There was one very interesting picture illustrative of volcanic action, perhaps the best of this particular kind that we have met with, showing the intrusion of a basalt dyke into a mass of rock of quite another kind, this black wall of eruptive material having a very curious effect. On the whole, Mr. Monckton may well be congratulated upon his pictures, and

upon the interesting remarks which, wholly without notes, he made upon them.

Dr. Armstrong occupied the chair, and echoed the feelings of the members when he said that the lecturer had afforded them a very enjoyable evening.

#### THE WOOLWICH PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE Fifth Annual Exhibition of the Woolwich Photographic Society was held at the St. John's Schoolroom, Wellington-street, Woolwich, on the 23rd, 24th, and 25th February last.

The Society is not one of those which makes a great stir in the world; nevertheless, in the management of its annual Exhibitions, there are many points which might be studied with advantage by other societies holding exhibitions, which are accounted of far greater importance. In the first place, it has never been found necessary to offer medals, or awards of any description, in order to induce members to exhibit. This shows an admirable *esprit-de-corps*, and it also shows that there is little ground for the supposition that, in order to make an exhibition a success, it is necessary to cater for the "pot hunters." Then, the errors which we are obliged to point out in one year's exhibition are not forgotten, but are avoided as far as possible in the next, and there is ample evidence in other things that those who are responsible from year to year for the organization, management, and arrangement of the exhibition, work well together and for the common interests.

On entering the gallery we were favourably impressed with its general appearance. The improvement we found to be partly due to the less crowded state of the walls, for this year the Society has depended more upon its own members, and has been able to all but dispense with the usual loan collection, and partly to the absence of frames of startling hues, which we have had occasion to deprecate in former years. There was a slight decrease, numerically, in the members' pictures, but the average size had considerably increased. The pictures were tastefully arranged, the extra room at command allowing them to be opened out.

Although the average quality of the work was undoubtedly higher, the improvement seemed to be due rather to a levelling up from the bottom than to any striking improvement in the older workers, but that is the usual comment on this season's Exhibition.

Mr. H. J. Spencer had a fine series of pictures all worthy of notice. We may particularly mention *Silver Birches*, *Washing Day at Gurinperlé*, and *Over Stony Ways*. Mr. F. W. Maehen had a charming moorland study, *Amid the Misty Wood*, though its extremely cool grey tone struck us as less pleasing than a warmer colour might be, and his other pictures were good.

In Architectural work we were glad to see Mr. J. B. Panting again exhibiting. We missed him last year. The interiors of St. Saviour's, Southwark, printed in carbon, were all fine, and we can equally bestow praise on Mr. W. H. Dawson. We preferred *From Transept to Choir*, *Winchester*. Mr. C. Churchill had also commendable work, though, in his bromide prints especially, there is a tendency to hardness and want of depth. Mr. J. Hope's *Playmates*, a little girl and a big dog, was good photography, but quite conventional in treatment. In his portrait of a little girl he had quite missed a very good thing. It wanted trimming down considerably. Mr. G. Japp has very much improved in technical photography. Of his four well-chosen subjects we prefer *After the Shower*. Mr. C. H. Imrie's *The College, Cobham, Kent*, made a very pretty little picture.

Figure studies were not numerous. Mr. R. J. Redding's *Ready for Mischief* was unconventional and had plenty of "go" in it. In *A Morning Bath*, a frame which included some dozen or so little pictures of a child in a bath, as varied as attitude and expression could make the same subject. Mr. A. J. Allen scored a distinct success, and his landscapes were good. Other members who deserve notice were Messrs. J. Desforges, M. Gottfried, A. Ames, and S. Hughendon.

The small loan collection consisted of works by Messrs. J. Mummery, H. Stuart, and J. B. B. Wellington. The lantern slides were, perhaps, of not so good an average as last year's. The trade exhibitors were Messrs. Barron & Wellcome, J. J. Griffin & Sons, and Mr. A. J. Wing, a local dealer. As usual there was a lantern entertainment and concert on each evening the Exhibition was open.

#### NORWICH LADIES' CAMERA CLUB EXHIBITION.

THE Ladies' Camera Club, which was formed in 1896, made its *début* before the public of Norwich last week, when the result of the work of its members during the last twelve months was placed on view in the room of the Woodpeckers, in Exchange-street. The Club is a small and select institution, comprising only fourteen members, of whom five are honorary, and the 800 odd pictures which adorn the walls are the work of the remaining nine. That so many views should be hung says much for the industry of the nine, and the great merit of them is eloquent of their ability. This is really the third Exhibition this enterprising Club has held, but the two previous ones, which took place at Carrow Abbey,



were private, and the reason for making the present public is probably to be found in the fact that the members desire to aid the funds of the Jenny Lind Infirmary, for not only is the money taken for admission to be given to that admirable institution, but whatever may be realised by the sale of any of the pictures is to be devoted to the same good purpose. Many of the photographs were taken during the summer outings of the Club, which included a wherry trip on the Norfolk Broads; but they are by no means confined to local views. There are landscapes, seascapes, pictures of flowers, of buildings (interiors as well as exteriors), and of persons, although the latter are few in number. Many of the pictures are enlargements and most of them are very tastefully framed. It is a rule of the Club that the members shall not delegate any of the work to others, professionals for instance; otherwise it would be difficult to believe that amateurs were capable of producing such highly meritorious results. There are many pictures in which very beautiful effects have been obtained, and the carbon work is in all cases excellent. The cloud effects and the appearance of night have been produced with a remarkable degree of perfection, and, indeed, Mr. Percy Lund, the Editor of the *Junior Photographer*, who judged the pictures, declares that it is the best Exhibition of the kind he has ever seen in the provinces, while it is the only one that has been given by a ladies' club. Mr. Lund made a careful inspection of the pictures, and selected nine by three of the ladies as the best in the whole collection. They were as under:—By Mrs. E. T. Boardman: *Narcissus, Cherry Blossom, and Boats on the Nile*. By Miss Edith L. Willis: *By the North Sea; Tom, Tom, the Piper's Son, and Twilight*. By Miss Willis: *Dutch Fishing Boats, Lake of Thun by Moonlight, and A Norfolk Landscape*. These three ladies will receive prizes, and between them will hold a silver teapot, which was to have been awarded for the best collection, but the Judge declared that they were all of equal merit.

#### THE HASTINGS EXHIBITION.

It is some nine years since the Hastings and St. Leonards Photographic Society held their last Photographic Exhibition, and local photographers therefore had looked forward with considerable interest to that held, under the auspices of the Society, at the Public Hall last week. There were about 100 exhibitors, with about 500 exhibits, including several from America, and they were displayed in the Hall so as to appear to every advantage, thanks to the efforts of the energetic Secretary, Mr. A. Brooker. Besides those sent for competition, there were some fifty photographs lent by the Royal Photographic Society (Affiliation Loan Collection), which were ranged below the platform, while at the other end of the Hall there was a collection of cameras and different kinds of apparatus. Very general satisfaction was given by the way in which the Judges whose services the Photographic Society had secured performed their duties—Mr. Wilson and Viscount Maitland, who were assisted by the Duke of Newcastle. There were six classes in which medals were awarded by the Society, and two in which the Hastings and St. Leonards Borough Association offered prizes. The two latter classes were for lantern slides and photographs or art sketches, illustrative of Hastings, St. Leonards, and neighbourhood, and their object was to obtain a collection of lantern slides and a series of post cards for the purpose of making widely known the attractions of the town and district. In this section of the Exhibition Councillor Dr. Gray, Councillor Boutwood, and Mr. R. White Ford (the Chairman of the Borough Association) acted as Judges, but the exhibits hardly came up to expectations. There were but few entries for lantern slides, and the first prize, which was to have been given by the President of the Photographic Society, was not awarded. The second prize was three guineas, which was obtained by Mr. W. A. Thomas, with an admirable set of slides, representing scenes well known to Hastingsers, such as Battle Abbey, Hastings Castle, the Pier, several views of the Parade and the Old Town, and of the Beach. Mr. Joshua Smith was awarded third prize (two guineas) for a similar set, noteworthy among which were a couple of views of Eversfield-place and Grand-parade, St. Leonards, a rough sea at St. Leonards, the Baths Promenade, the Alexandria Park, and Old London-road.

At the opening ceremony the Mayor said that the Exhibition was held at an opportune time. In the closing years of the present century rapid strides had been made in every branch of science, but in none more so than in the photographic art. It was his duty to declare the Exhibition open, and he would also, in the name of the Photographic Society, and in the name of the town, thank Mr. Wilson Noble and Lord Maitland for the assistance they had given in acting as Judges on that occasion, and also the Duke of Newcastle for his services.

Mr. Wilson Noble, in returning thanks, said that it had been a very great pleasure for them to come down to that Exhibition, and they had felt it an honour to act as Judges. They had had the opportunity which, perhaps, would not be the case with all who visited that Exhibition, of examining carefully all the exhibits, and he could safely say, and he was sure Lord Maitland would agree with him, that the Exhibition was a very marked success. He remembered being present at a similar Exhibition in that room some years ago, which was considered to be successful, but the present Exhibition far eclipsed the former, both in technical and pictorial excellence. It was always

difficult for Judges to decide whether they should pay most attention to the technical or the pictorial side, but he (the speaker) believed in the latter, as technical excellence was only a means to an end, the final result being the thing to be looked to. Taking the Exhibition as a whole, the Society were to be heartily congratulated on it as a considerable success.

The Judges' awards were as follows:—

Class A.—Gold medal withheld; silver medals, No. 65, Mr. J. E. Dumont; No. 70, Mr. C. Job.

Class B.—Silver medal, No. 115, Mr. C. Job; bronze medal, No. 91, Mr. W. D. Welford.

Class C.—Silver medal, No. 144, Mr. James Rooth; bronze medal, No. 148, Miss M. Weil.

Class D.—Silver medal, No. 212, Mr. E. R. Bull; bronze medal, No. 214, Mr. A. J. Loughton.

Class E.—Silver medal, No. 261, Mr. W. F. Ward; bronze medals, No. 242, Mr. E. G. Boon; No. 263, Mr. G. H. Capper.

Class F.—Silver medal, Nos. 315 to 320, Mr. G. Bird; bronze medal, Nos. 306 to 311, Mr. E. Marriage.

Class G.—Silver medal withheld; bronze medal, No. 345, Mr. T. H. Redwood.

Class H.—Silver medal, No. 383, Mr. J. Smith; bronze medal, No. 366, Mr. C. W. Kennaway.

#### THE BIRMINGHAM EXHIBITION.

A VISIT to the Fourteenth Annual Exhibition of the Birmingham Photographic Society, which is being held this week in the galleries of the Royal Society of Artists, enables us not merely to note the great advances which photography in its pictorial aspect has made during the last three or four years, but also the forward strides which the Society itself has taken in promoting and holding a representative Exhibition of modern work. It is four or five years since we personally examined a Birmingham Photographic Exhibition. At the time we speak of, the display was held in the well-remembered Hall in Needles Abbey, lit, if we do not mistake, entirely from one side. The apartment was far too small for the purpose, and consequently very easily became crowded. A minute and confusing classification was in vogue, and the newer methods of framing and printing had not yet taken hold to an appreciable extent of those who sent in contributions to the Exhibition.

All this seems only as yesterday, and what a revolutionary change has apparently taken place since then! The great room of the Royal Society's galleries is an ideal apartment for hanging pictures in. It is of circular form; the light comes from the top of the dome. The walls, covered with a light green fabric, and draped at intervals with a darker variety, bear some hundreds of excellent photographs, which are viewed under the best possible conditions of lighting, surroundings, and hanging. Truly the Birmingham Society are greatly to be envied for the fine environment they are enabled to give their Exhibition, which could not be held under more favourable circumstances. Several smaller halls spring from the main rooms, and these have been utilised to the best advantage in sheltering individual collections of work and portions of the Exhibition.

This year the classification has been brought down to simple limits. The classes consist only of Open, a Loan Collection, Members' Survey, Lantern Slides. The Judges were Messrs. A. Horsley Hinton, John H. Gear, F.R.P.S., and W. J. Wainwright, A.R.W.S. In all, considerably over 500 photographs were hung, and the Lantern-slide Class attracted twenty-one competitors, who sent in sets of six or more. Amongst Birmingham professional photographers the following sent in special exhibits, contained in separate rooms: Messrs. Harold Baker, 58, New-street; J. W. Beaufort, Colmore-row; J. A. Draycott, New-street; H. J. Whitlock, New-street and Broad-street. The North Room was devoted to an exhibition in novelties in apparatus and appliances, by the following firms: Messrs. Morris Banks & Co., Bull-ring; C. S. Baynton, Exchange-buildings, New-street; Griffiths & Co., Union-passage and Highgate-square; Southall Brothers & Barclay, 1, Broad-street; W. Tylar, High-street, Aston; Birmingham Mutoscope Company, Limited; J. J. Griffin & Sons, "Velox," London; F. Lewis, 16, Gladstone-road, Sparkbrook; Harcourt, Fox, & Co., County Chambers, Corporation-street.

The Open Class, containing 156 exhibits, was an exceptionally strong one, and the Judges must have had a rough time in coming to their decisions. It struck us that the imitative tendency into which certain exhibitors have recently fallen was very strongly apparent. For instance, to take an example which we noted as we passed over the exhibits, Mr. C. T. Humphrey's *Wet Night—Dalston-lane* was highly suggestive of Mr. Paul Martin's *Clapham Pavement*. Mr. H. C. Leat's *Winter and October* are full of realistic wintry effect, and one of the most charming little views of a yacht race we have seen comes from Mr. W. T. Greatbach in No. 46, *The Race*. The same exhibitor's landscape photographs are undeniably good. Mr. G. J. T. Walford may be advised not to follow too closely the style and methods of Mr. A. Horsley Hinton, who has several other imitators and copiers in this Exhibition. We think that executives should take note of this sort of thing. The portraits were exceptionally fine, Mr. J. A. Draycott particularly distinguish-



ing himself with some good work. On the other hand, Mr. Geckle's *Study of a Child's Head* looks uncommonly like one of Mr. Harold Baker's *Geoffrey*, we think it is called, and in Mr. Charles Speight's *Portrait of a Lady* we seem to see Mr. William Crooke's *Lady Mary Lygon* over again. Doubtless the force of example is very strong in photography, but, where imitation is carried so far as to amount to copying, we think a protest is called for.

Mr. C. S. Baynton strikes new ground this year, and some of his figure studies are so extremely good that we are justified in looking for really great things from him in the immediate future. He has a fine eye for a gracefully posed figure having the attitude and movement of life, but at present he is not quite sure of his powers, and therefore falls into the easily remedied defect of overcrowding his canvas, so to speak, thus detracting from simplicity of effect, which is the highest result to aim at. Mr. Pirie Macdonald's portraits of *Mistress Dorothy* and *Miss Annie C.* stand out by reason of the striking power shown in the posing and lighting. We wish we could see more of the work of this exhibitor, who is a leading professional in the States. On the whole, if we make allowance for the imitative tendency we have already referred to, the portraiture comes out very strongly. One of Mr. Draycott's exhibits, the head of a lady in profile (No. 113), we seem to have seen before. It is uncommonly like a similar subject shown years ago by Mr. Percy Lankester. Other pictures of high merit are Mr. F. Howard Mercer's *Buoy repairing, Brizham*; Mr. Smedley Aston's rustic studies, Nos. 16 and 17; Mr. W. A. Fraser's view of *Fifth Avenue (N.Y.) in Winter*; Mr. Ernest Marriage's well-chosen, carefully exposed little architectural bit, *An Old Belfry*; Mr. Thomas Carter's clever hand-camera studies (No. 85); Miss Boden's group of lady and children (No. 129); and Dumont's always welcome *Village Choir*. The architectural studies are not numerous, but are a remarkably level series, C. S. Baynton, Harold Holcroft, W. R. Bland, and J. H. Gash sending in very good work.

The Loan Collection, numbering over a hundred examples, makes a fine exhibition in itself. Familiar work comes from Messrs. A. Keighley (Mr. Keighley's studies have a curiously old-fashioned effect in our eyes, they would have been accounted very great a few years ago, but now seem to suffer from over-elaboration of detail), Sweet, Warneke, Harold Baker, A. Horsley Hinton, H. W. Bennett, W. J. Warren (amongst Mr. Warren's series are some delightful studies of a little girl who readily lends herself to ideal treatment by the lens), E. R. Ashton, W. Crooke, J. Stuart Bhedwar, Rejlander, Lund, Karl Greger, J. Craig Annan, Sutcliffe, Thomas, and others.

In the Members' Section the experienced hand of Mr. Ernest Underwood is responsible for several admirable views at Wells Cathedral and Oxford, and bold in effect is Mr. Francis A. Bolton's *Scotch Firs*. *Reedy Wastes*, by Mr. W. Smedley Aston, shows how easily Mr. Hinton may be imitated. *A Blast Furnace*, with its yellow effect of light, is a clever rendering of the subject. *Awaiting Evening Tide*, a marine study by Mr. A. C. Peach, attracted attention, and Dr. Hall-Edwards has a capital bit of technique in *In the Workshop*. *Sweet Seventeen*, by Mr. Aston, a delightful study of a young lady, simple and unconstrained in the pose, and softly lit, we highly admired at Bradford. It is the best thing we have seen from Mr. Aston's hands. Capital views by Professor Allen (President) and Mr. George Whitehouse are shown in the class, to which notable contributors besides those named are Messrs. Hugh Lewis, H. J. Yeates, and William Topham. The work shown by the members of the Birmingham Society is really so good that a first-rate exhibition could very easily be organized without outside aid.

In connexion with the Warwickshire Survey some fifty photographs are hung, and Dr. Hall-Edwards, one of the most noted radiographers of the time, has half a dozen interesting studies.

Great pressure on our space obliges us to very much abbreviate our notes on this Exhibition. Very little work was hung that could be objected to on the score of quality, and the Open Class is a singularly level display. But among these photographs the imitations are so palpable that we feel it a duty to call the attention of Exhibition executives to the matter. We have only noticed this tendency during the last year or so, and it should seriously be considered how far it should be countenanced or encouraged.

#### A WIFE'S PHOTOGRAPHS—"NECESSARIES."

JUDGE STONER delivered judgment, on February 24, at Marylebone County Court, in a case in which a photographer, Mr. Hayman Seleg Mendelssohn, Pembroke-crescent, Bayswater, was the plaintiff, and the defendants, the Hon. D'Arcy Lambton and his wife, of Gordon Mansions, W. Mr. Lowe was counsel for the plaintiff; Mr. Shearman represented Mr. Lambton, and Mr. Chapman appeared for Mrs. Lambton. His Honour said the plaintiff sued the defendant for 29l. 18s. 6d., for photographs and a miniature, the cost of the latter being 10l. 10s. The photographs and miniature were portraits of the wife, and, the plaintiff alleged, were ordered by her with her husband's authority. The order, sale, delivery, and prices were admitted, but Mr. Lambton denied that his wife had any such authority. Mr. Lambton, formerly a lieutenant in the Royal Navy, married the co-defendant in 1888. He then had a fortune producing

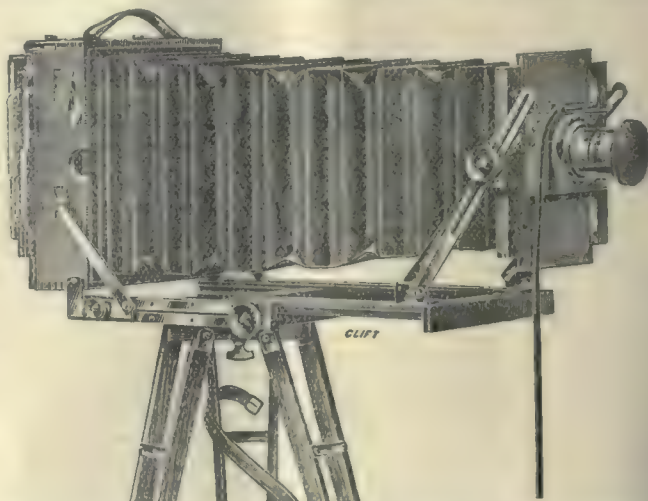
about 1000l. a year, while his wife had none. In 1892 Mr. Lambton settled a large account for his wife's photographs. About this time she told him that she had recently got from her grandmother in Australia an allowance of 400l. a year, and it was then agreed that for the future she should pay her own personal expenses. The husband continued, however, to pay large sums for her personal debts. In 1897 he absolutely refused to pay these personal debts for her, and next year they separated, he formally prohibiting her from pledging his credit. It was about this time that he learnt that his wife never had a settled allowance, although she had received from friends gambling at Monte Carlo, and from other sources, some 200l. or 300l. a year. Upon the whole, considering that Mr. Lambton had paid about 10l. a year for three years on account of his wife's photographs, apparently recognising them as "necessaries," he (the Judge) thought the case resolved itself into a question of excess of authority. He found that Mr. Lambton was liable for 10l. 10s., and that the co-defendant, Mrs. Lambton, must be held to have pledged her personal estate for the goods absolutely or conditionally, in case her husband refused to pay. He, therefore, found against her for the balance, 19l. 8s., with costs.

## Our Editorial Table.

### THE "SANDERSON POPULAR" CAMERA SET.

George Houghton & Son, 88 and 89, High Holborn.

THE Sanderson Popular Camera, although introduced at popular prices, has all the features and advantages of the more expensive form. A few of the points claimed for the camera are that it has a greater rise of front than is obtainable with any other. It does away with the tilting of the camera, entirely dispenses with the swing back, and, in place of all the old movements and adjustments of camera and stand, a greater latitude between lens and plate is secured, with the power to swing the front and



to compose a subject on the ground glass and roughly focus it, all by one and the same action; it is controlled by two adjusting screws only, one on either side of the camera front.

The Sanderson Popular Camera Set comprises a camera with wide-angle movement, special long extension (half-plate, twenty inches), &c.; double dark (book-form) slide; rapid rectilinear achromatic lens with iris diaphragms; Thornton-Pickard time and instantaneous shutter; three-fold tripod stand.

### ARMSTRONG'S GUIDE TO PRACTICAL PHOTOGRAPHY.

By T. N. ARMSTRONG. 142 pp. Price 1s.

London: Dawbarn & Ward, 6, Farringdon Avenue, E.C.

READERS of this JOURNAL have for many years been familiar with the numerous practical articles which Mr. Armstrong has contributed to its pages. His advice is the outcome of mature experience, and can always be relied upon. In the closely printed volume before us he devotes some thirty-nine chapters to his subject, to most of the ordinary branches of which he introduces the reader. It is difficult to select any one part of the book for special mention when the whole of it bears the impress of a master hand; suffice it to say that it is written very exhaustively throughout, and that it may be recommended as a safe guide to place in the hands of a beginner. There is much wisdom in the concluding sentence of the chapter on apparatus: "The requirements of a good photographic outfit are not many, and need not be unnecessarily expensive, to produce excellent all-round work."



## THE FRENA PNEUMATIC RELEASE.

R. &amp; J. Beck, Ltd., 68, Cornhill, E.C.

THIS attachment consists of an indiarubber ball and tube acting upon a spring plunger. Squeezing the ball pushes in the shutter release and sets off the shutter, thus making the exposure. To attach it, two screws are screwed into the camera, as shown in the figure, and the apparatus can be clipped on or taken off as required without removing the screws.



The advantages of the release are, that it overcomes the risk of shaking the camera in the act of setting off the shutter; that it enables an exposure to be made in many positions where it is otherwise most inconvenient to get at the shutter set off. It is pointed out that with a long tube and large ball the operator may retire to a position at a distance from the camera and make the exposure unobserved; he may also take his own portrait or may form part of a group.

## ADUROL.

Agents, A. &amp; M. Zimmermann, St. Mary-at-Hill, E.C.

ADUROL is a new photographic developer, said to be obtained from hydroquinone by a patented process. It is sent out in the form of a fine greyish-white powder, and among the advantages claimed for it are that the image is seen in about a third of the time taken by hydroquinone to produce an appearance; greater detail and strength of half-tone are obtainable; the total time necessary to complete development is shorter; no stain results; and the solution may be used over and over again. It has also been ascertained "that two parts by weight of adurol, with a like amount of an alkaline carbonate and sulphite, develop in the same time a more vigorous negative than three parts by weight of hydroquinone." Adurol, therefore, obviously has features of a distinctive character to recommend it to the notice of photographers.

## THE VICTOR FIXING SALT.

Agents, Fuerst Brothers, 17, Philpot-lane, E.C.

THIS is a new preparation of Messrs. Lumiere's, the hyposulphite being sent out in the form of an anhydrous acid compound. Among the advantages claimed for using the salt in its converted form is that it dissolves instantaneously in water: Although the weight is about two times less than hypo, it contains the same quantity of active substance. On account of the acid reaction a great number of negatives can be fixed without discolouring the solution, even if the negatives have been insufficiently washed after development. It becomes possible, when using this salt, to fix plates and papers without washing them after development. It slightly hardens the gelatine. The following is the bath recommended for plates and papers:—

Water .....	1000 grammes, or say 25 ounces fluid.
Victor fixing salt.....	80 " " 2 ounces weight.

## THE VANGUARD ACID-PROOF NEGATIVE VARNISH.

Manufactured by the Vanguard Manufacturing Company, Maidenhead.

WE can cordially recommend this preparation as a sure preventive of stains on negatives. Applied either hot or cold, it dries very quickly, and thereafter interposes a practically impenetrable and impervious film between the silver image and external influences. We have subjected negatives coated with the Vanguard acid-proof varnish to a number of very severe tests, and have found that it acts as a perfect protector of the image. Negatives covered with this varnish are, in the ordinary course of things, absolutely secure from chemical attack. Photographers will find a supply of the varnish one of the best investments they can make for the negative room.

MESSRS. ELLIOTT & SON, of Barnet, send us an advanced copy of a new edition of their bi-monthly journal, *The Photographers' Record*. Dealers who have not hitherto had supplies can be furnished upon application for free distribution. *The Record* in its new get-up presents a very tasteful and artistic appearance. The contributions by Mr. Bothamley and Mr. Land, on "Development" and "Impressionism," are useful and readable.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, March 8, at eight o'clock. Members' Open Night.

G.E.R. MECHANICS INSTITUTION (PHOTOGRAPHIC SECTION).—Photographs for the Open Class of this Exhibition will be received up to March 13, instead of 11th, as already announced.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On Thursday next, March 9, at eight o'clock, Mr. A. T. Harris will read a paper, "A Chat on Photographic Lenses." The meetings are always open to visitors, who require no card of invitation.

MESSRS. TRENEBY & COPE, carbon, platinum and silver printers, of 147, Prescott-road, Fairfield, Liverpool, have dissolved partnership. Mr. W. Cope has taken over the business, which will in future be carried on by him under the style of W. Cope & Co.

CRIPPLEGATE PHOTOGRAPHIC SOCIETY.—The next meeting of this Society will be held on Monday, March 6, at the Cripplegate Institute, and will take the form of a Lantern Night. Intending members are invited to make application for full particulars to the Hon. Secretary, Mr. Alfred T. Ward, Cripplegate Institute, Golden-lane, E.C.

BIRMINGHAM INDUSTRIAL EXHIBITION.—We are asked to remind readers that for the photographic section of this exhibition entries close Monday next, March 6; London exhibits must reach Mr. Welford's office by Wednesday next, 8th inst., and all other exhibits (except those from the South London Exhibition) must reach Bingley Hall by Saturday, 11th inst.

THE Fifth Annual Dinner of the Hackney Photographic Society was held on Tuesday evening, February 28, at the London Tavern, Fenchurch-street, E.C. Mr. Edward Puttock (President) occupied the chair, and he was supported by about sixty members and visitors. A feature of the evening was the presentation to Mr. W. F. Fenton-Jones (the retiring Hon. Secretary) of a handsome diamond ring, subscribed for by members in recognition of his services to the Society since its foundation ten years ago. The presentation was made by Mr. Herbert Robertson, M.P. The toasts included "The Society," "The Visitors," and "The President," and, as usual at the Hackney dinner, that portion of the programme prepared for the amusement of the company contained a number of capital items capitally rendered. The dinner was a very great success throughout.

THE ADOPTION OF THE METRIC WEIGHTS AND MEASURES.—At a meeting of the Manchester and Salford Trades Council held on the 16th ult., the following resolution was passed:—"That this Council desires to again express its sympathy with the objects of the Decimal Association, believing that by their adoption the interests of commerce and industry throughout the United Kingdom will be much benefited." All the leading Trades Unions in Great Britain strongly support the movement for the adoption of the metric weights and measures by this country, and on two occasions at the Congress of Trades Unions resolutions in favour of this reform were unanimously passed. It appears from the resolution passed at Manchester last week that these trade organizations intend to agitate with fresh vigour for legislation to render the metric weights and measures compulsory.

THE movement for preventing the destruction by the builder of Croydon Hurst, Croydon, is rapidly gathering increased energy. The secretary of the Preservation Committee has received a large amount of correspondence from all parts of the country, showing the widespread interest in the project for acquiring the whole of the hill for the public for ever. The Committee, some seventy-five strong, met the Croydon Council on Monday last as a deputation, urging them to push forward the inquiries they have in hand to obtain the price for the remaining fifty acres from the Whitgift governors. Under present arrangements nothing is likely to be done for some time to come unless in response to a definite demand by public opinion. A mass meeting will be held at the large public hall, Croydon, on March 10, when resolutions in favour of acquiring the whole of the Hurst on favourable terms will be submitted. Representatives will be present from the Croydon Council, the Rural District Council, Microscopical Society, the National Trust, Selborne Society, Commons Preservation Society, Croydon Guardians, School Board, Camera Club, Chamber of Commerce, &c. A series of lantern slides illustrating the Hurst is in preparation by Mr. Hector Maclean, which will be shown at numerous local meetings which will follow the mass meetings.

A PROFESSIONAL'S LECTURE TO AMATEUR PHOTOGRAPHERS.—On Thursday evening, February 22, Mr. F. Fielding delivered a lecture to amateur photographers at the studio of Messrs. Fielding & Jepson, Mincing-lane, Blackbarn. The subject of the lecture was "Carbon Printing," and Mr. Fielding illustrated his remarks by practical demonstration. He explained the necessity of printing by means of an actinometer, and went through the process of developing several carbon tissues, showing how they may be transferred on to opal, glass, &c. The lecture was made additionally interesting by the fact that any one was allowed to develop tissues himself in order that the process might be better understood. Mr. Fielding pointed out the great simplicity of the working of this process as compared with the P.O.P. process, and added, that not only was it much cheaper but less time was wasted than in the working of silver paper. The results of the carbon process could scarcely be compared with the silver paper for beauty, whilst any number of tints, ranging from dark blue, sea green, purple black, sepia, terra cotta, &c., could be obtained. The prints also, unlike most silver paper, were absolutely permanent, time and wear having scarcely any effect upon them. Several specimens taken on carbon were exhibited, and a most pleasant evening was spent. At the close a vote of thanks was passed to Mr. Fielding for his interesting and instructive lecture, and Mr. Fielding, in replying, remarked that he was pleased to do all he could to help any amateur. To read about carbon printing in a book, he said, was like learning to swim by reading. They wanted to see it done practically, and to try it themselves, before the simplicity of the process could be realised.



## Patent News.

THE following applications for Patents were made between February 13 and February 18, 1899:—

- CAMERAS.**—No. 3194. "Improvements in Photographic Cameras." M. NIELL.  
**DARK SLIDES.**—No. 3257. "Improvements in or relating to Photographic Dark Slides or the like." H. FARMER.  
**BACKING TRAY.**—No. 3262. "Photographic Plate Backing Tray." J. H. AVERY and C. VARNAM.  
**STEREOSCOPIC APPARATUS.**—No. 3274. "Improvements relating to Coin-freed and Stereoscopic Apparatus." Communicated by E. HANAN and E. GAUTHIER. A. F. SPOONER.  
**KINETOSCOPIC PICTURES.**—No. 3285. "Improvements in and in Means or Apparatus for Producing and Exhibiting Kinetoscopic and like Pictures." H. A. BROWN.  
**FILMS.**—No. 3419. "Improvements in Photographic Films and in Apparatus for Using same and connected therewith." J. E. THORNTON.  
**LIGHT-FILTERS.**—No. 3492. "Improvements in and relating to Translucent Screens or Light-filters for Use in Photography." H. FARMER.  
**COLOUR PHOTOGRAPHY.**—No. 3560. "Improvements in Colour Photography." W. N. L. DAVIDSON.  
**CHANGING BOXES.**—No. 3582. "Improvements in Photographic Changing Boxes." H. WOOD.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
6.....	Barnet and District .....	P.O.P. Demonstration. W. H. Harrison.
6.....	Beverley .....	Bells and Bell-ringing. The President.
6.....	Bradford Photo. Society .....	Members' Slides, Prints, &c.
6, 7 .....	Camera Club .....	Exhibition of Novelties.
6.....	Kingston-on-Thames .....	{ Apparatus for Animated Photography. Birt Acres
6.....	Putney .....	{ Lighting and Exposure. Francis T. Beeson, F.R.P.S.
6.....	Richmond .....	Affiliation Slides, B Set.
7.....	Ashton-under-Lyne.....	Venetian Pictures. James Shaw.
7.....	Birmingham Photo. Society ..	{ Display of Lantern Slides sent in for Competition at the Annual Exhibition.
7.....	Gospel Oak .....	{ Exhibition of Members' Work and Social Evening.
7.....	Hackney .....	Annual Meeting.
7.....	Iale of Thanet .....	Lantern Slides. John A. Hodges.
7.....	Lewisham .....	Development Competition by Members.
7.....	Rotherham .....	Architectural Photography. J. H. Avery.
8.....	Croydon Camera Club .....	Lantern Night.
8.....	Leeds Camera Club .....	Crysoleum. J. Skilbeck.
8.....	Photographic Club .....	Members' Open Night.
8.....	Southport .....	Three colour Photography. Henry Ball.
9.....	Camera Club.....	{ Possibilities of Electric-power Supply in England. Leonard Addenbrooke, M.I.E.E.
9.....	Darwen .....	Flashlight Evening.
9.....	Liverpool Amateur.....	{ X Rays Up to Date. Dr. C. Thurstan Holland.
9.....	London and Provincial .....	{ A Chat on Photographic Lenses. A. T. Harris.
9.....	Oldham .....	My Camera and I on the Antrim Coast. J. W. Cooper.
9.....	Woolwich Photo. Society .....	Slides contributed by Affiliated Societies, Set A.
10.....	Croydon Microscopical .....	Channel Islands, Norfolk Broads, and Lake District Slides. A. P. Hoole.
11.....	Croydon Camera Club .....	Forty-first Public Lantern Show.

### ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 28,—Technical Meeting, Mr. J. J. Vezey in the chair.

#### APPARATUS FOR ANIMATED PHOTOGRAPHY.

Mr. BIRT ACRES read a paper on the above subject, and described and demonstrated the Birtac, his apparatus for taking and exhibiting animated photographs. Having recalled the fact that he was the first to show such pictures on the screen in England, when, some three years ago, he gave an exhibition at a meeting of the Society, he proceeded to give a brief historical sketch of the history and development of this branch of photography, which he considered would be the photography of the future. Starting with the old "wheel of life," or Zoetrope, he alluded to the work of Professor Muybridge, who used a series of cameras for taking the negative; Mr. Friese Greene, who made the first serious attempt to take a series of pictures on a continuous band of sensitised material; Professor Anschütz; M. Demeny; MM. Lumière; and M. Marey; and also referred to the Edison Kinetoscope and the Biograph and Mutoscope, discussing the advantages and disadvantages of the various forms of apparatus which had from time to time been introduced. Mr. Birt Acres' latest instrument for "at home" animated photography, the Birtac, has already been described in these pages, and it is unnecessary to refer in detail to its construction; it is sufficient to say that it is a small but very complete and practicable apparatus, which is sold at a comparatively low price, and that by simply altering the position of the lens it can be used either for taking the negatives or exhibiting the transparencies, a film twenty feet in length being employed, containing 640 pictures, each half an inch by three-eighths of an inch, the whole being projected in about a minute. The apparatus is fitted for use with incandescent gaslight as the

illuminant, and Mr. Acres showed his very ingenious and effective method of increasing the pressure of the gas, by means of which he is able to obtain a well-illuminated disc of five feet diameter. The pictures shown at the conclusion of the paper were projected upon a screen of ground glass about two feet square.

At the close of the exhibition, Mr. CHAPMAN JONES, while recognising the improvement effected by the increase of gas pressure, suggested that, having regard to the fragile nature of the incandescent mantles, it might be advantageous to adopt acetylene as the illuminant.

Mr. BIRT ACRES replied that he did not yet know enough about acetylene to justify him in putting a lamp upon the market, and the restrictions of the London County Council and other authorities made him doubt the wisdom of adopting such a course.

Mr. DANDO dissented from an opinion which had been expressed by Mr. Acres in favour of perforating the films at the margin rather than between the pictures.

Mr. ACRES said that, although by the latter method the whole width of the film could be utilised for the negatives, it was then necessary to waste a space between each two pictures, as by continual use small portions of the film were split off, and the negatives were spoiled unless the perforations were made upon the blank spaces between them.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 23,—Mr. S. Herbert Fry in the chair.

The HON. SECRETARY read a communication he had received from Mr. A. L. Henderson, touching the matter discussed in Mr. Howard Farmer's recent paper before the Association upon the light in the dark room. He had little doubt that many of the members would remember that some years ago he offered a prize to any one who would devise a safe light. Although his offer remained open for a long time, not a single candidate came forward until, some years after the withdrawal of his offer, he received a communication from a very clever Scotch photographer on the subject. This man offered the following suggestion in the hopes of securing the award, viz., to pass the light through a number of pinholes and then reflect it into the dark room. This idea was, however, found wanting upon examination. Mr. Henderson proceeded to describe some experiments which he had undertaken at that time. Dr. Gladstone, at a meeting of the British Association, exhibited some photographs showing the peculiar property of a solution of disulphate of quinine. One of the Doctor's experiments was repeated by Mr. Henderson before the Association. Three wine glasses were arranged side by side, containing water, black ink, and a nearly colourless solution of disulphate of quinine respectively. The three were photographed together, and it was found impossible to distinguish any difference between the photograph of the vessel containing the ink and that containing the solution of quinine. It was suggested at the time that a cell of such a solution of quinine disulphate should be used in lieu of coloured glass for dark-room illumination, and Mr. Henderson had a lantern constructed for the use of such cells. The arrangement was useful experimentally, but was not found effective. Another of his ideas was to use light reflected from luminous calcium sulphide (Balmann's paint), both plain and filtered through coloured media; the light so obtained was very feeble and consequently fairly safe. Some advantage was also obtained by using a reflector of orange paper saturated with a solution of disulphate of quinine. Mr. Henderson has predicted that the day will come when it will be possible to prepare very sensitive plates in a white, or nearly so, light—in other words, to separate the actinic rays. Perhaps a judicious arrangement of coloured screens and sensitisers might lead to the desired result. Mr. Henderson also commented upon the opinion expressed by Dr. E. Vogel that the action which took place in formate toning was a depositing action and not a substitution process. Had this been the case, Mr. Henderson could have seen a great future before it, as richer prints might have been obtained from weak negatives. He did not agree with him, however, and sent some prints marked one and two to support this. Each print was cut in half and toned separately, one with formate and the other *minus* formate, and it was impossible to distinguish between them. A vote of thanks was passed to Mr. Henderson.

The CHAIRMAN showed five or six stereoscopic transparencies interesting as made by his father in 1857, in the wet-collodion days. They were instantaneous studies of waves, and spoke well for the processes of those early days. It was stated that the positives were made and sold to houses like Horne and Thornthwaite, at the wholesale price of a guinea a piece.

Mr. P. R. SALMON gave a brief account of his experiences in the Holy Land as a photographer, and showed about a hundred slides made from the negatives taken during his journey. His encounters with the Customs authorities, soldiery, &c., and the insight afforded the meeting into the powers of judiciously distributed "backsheesh" were of an entertaining character, and admiration for his photographs was freely expressed.

The Chairman supplemented the lantern display with some very fine slides from some of Rejlander's original studies from the nude, which met with every mark of appreciation.

### PHOTOGRAPHIC CLUB.

FEBRUARY 22.—Mr. Frank Hae in the chair.

Mr. E. W. FOXLEE made reference to the opinion that red tones were impossible upon Velox paper by direct development, expressed at the last meeting. Mr. Ethelbert Henry had said that they could be got, but exposure to daylight was necessary unless one had the patience of Job. Mr. Foxlee thought it might be of interest to show that red tones were quite possible by artificial light with an exposure so short as to induce one to think that Job's patience was much over-rated. He showed a series of prints ranging from red, through red-brown, to sepia, with exposures of three or four seconds with magnesium ribbon, the longest being two inches of ribbon burned five inches from the negative. The negative was an old collodion one, and the developer



Mr. Foxlee promised to give shortly, so soon as he had reduced to a definite formula the information he had gleaned from experiment.

Mr. WALTER D. WELFORD delivered his lantern lecture on the "Cumberland Fells" in that part lying round the old lead-mining district of Alston, the highest market town in the country, situated between Carlisle and Newcastle-on-Tyne. The pictures were such as to show what systematic procedure could do in evolving an entertaining series from a bleak, desolate, and monotonous tract of country such as this, and lecture and slides served to emphasise the views held by the lecturer regarding the unhappy tendency of Society lantern displays to degenerate into a mere procession of slides with nothing in the way of descriptive observations, excepting the make of plate, lens, stop, &c., a state of things which he hoped would not obtain for long.

**Kingston-on-Thames and District Photographic Society.**—February 20.—Mr. A. VANDENDRIESCHE lectured upon

#### ROME AND POMPEII.

After several photos of St. Peter's had been thrown upon the screen the lecturer showed a view of the portico of the Temple Faustina, special interest being attached to this picture by reason of the recent discovery of the spot where Julius Cæsar was cremated. Numerous views of the Colosseum having been passed through the lantern, the lecturer took his audience to Southern Italy, the first picture representing the Bay of Naples with Vesuvius in the background, this being followed by a collection of snap-shots secured in the vicinity of Pompeii. Included in these was a photograph of a typical South Italian team, consisting of a horse, a mule, and an ox. These teams, said the lecturer, often vary considerably in their zoological combination. He remembered, on one occasion, meeting a loaded cart going to market, the proprietor's wife and ass supplying the motive power. Another interesting picture represented the Capuchin monastery, the peculiarity about this building being that the entrance hall is situated on the top floor.

**Liverpool Amateur Photographic Association.**—February 23.—There was a crowded attendance of members and friends present to hear Mr. G. E. THOMPSON'S discourse on

#### THE CANYONS OF SOUTHERN FRANCE.

Mr. Paul Lange (President) occupied the chair. Mr. Thompson in a vivid manner described the remarkable limestone plateaux of the Garonne basin, which is of the greatest interest to ethnologists and geologists. The series of 130 pictures illustrating the course of the rivers Dordogne, Lot, and Tarn revealed scenic wonders, equalling in grandeur the famous canyons of America, and surpassing them in the added interest lent by ancient castles, chateaux, bridges, cottages, caves, and other relics of the mediæval times. The course of the Tarn is especially remarkable, and the lecturer's vivid account of his hazardous descent of its rapids was fitting climax to a bright, well-studied, and most entertaining narrative.

**Plymouth Photographic Society.**—February 24, the President (Mr. H. S. Hill) in the chair.—Mr. HENRY J. HISSSETT gave a lecture and demonstration on

#### PLATINOTYPE.

Mr. Hissett is an esteemed member of the Society, and though by no means an old photographer, his great energy and devotion to photographic art always enables him to accomplish most thoroughly that which he has set his heart on doing, time and expense being but very little considered. This fact is well known to his fellow-members, consequently he was a big "draw," and the large number who came were well rewarded. A full history of the process from the time of its introduction by Mr. Willis, together with the dates and particulars of his many patents, were given, and, with the aid of chemicals, Mr. Hissett, in several experiments, showed the principles involved. His lecture lasted exactly one hour, after which he gave a practical demonstration, developing about forty prints, from whole-plate and half-plate negatives. Taking the glycerine method first, he showed how slow it was possible to make the development, and how easily any particular portion of the print could be strengthened or kept back, also the method of getting good "vignettes." Then, with the developer heated to about 70° in a dish, he performed development at a faster pace, and eventually made several sepia prints, with the hot bath, with almost lightning rapidity, and all without a single failure. A set of prints, trimmed and mounted, duplicates of those developed that evening, were then passed round for inspection. These were the work developed by Mr. Hissett at a meeting of the Devonport Camera Club, where he gave a demonstration four months ago. They were, undoubtedly, very fine, many of them were printed and kindly sent to him for each of his demonstrations by the Platinotype Company, to whom he was much indebted.

**Redhill and District Camera Club.**—February 21.—A short paper was read by Mr. F. MARTIN DUNCAN on

#### CHOOSING A SUBJECT,

the lecturer confining his remarks chiefly to landscape photography. Mr. Duncan illustrated his lecture with photographs, to show the errors and mistakes generally made by the beginner. A discussion followed on the merits and elements of rapid plates in landscape photography, the general opinion being in favour of a plate of medium speed. At a subsequent Committee meeting, it was decided to start a circulating portfolio, to which members of the Club will be invited to contribute specimens of their work.

**Blairgowrie and District Photographic Association.**—At the Annual General Meeting of this Association on Tuesday, a framed photograph, entitled *Woodland Sunshine*, was presented to the Association Gallery by Mr. J. Kearney, jun., Liverpool, for which the Secretary was instructed to thank him. The *Gazetteer of Great Britain and Ireland* (3 vols.) and *Photograms* of 1895-96 97 98 from the President and four members were added to the library. The Secretary and Treasurer's reports were submitted and considered satisfactory, and office-bearers for the season were elected as follows:—*President*: Mr. Alexander Gaskie.—*Vice-Presidents*: Messrs. T. C.

Gorrie and John B. MacLachlan.—*Executive*: Messrs. Petrie, Richardson, Soutar, Mitchell, and Hendry.—*Lanternist*: Mr. H. S. Fyfe.—*Treasurer*: Mr. D. G. Monair.—*Secretary*: Mr. H. B. Jauntson. It was remitted to the executive to prepare a syllabus for the coming season.

**Edinburgh Photographic Society.**—The Exhibition of the Society, which has been open in the Society's Hall, 38, Castle-street, for the last three weeks, was formally closed on Saturday night. There was a crowded attendance, presided over by the President, Mr. A. Eddington, F.I.J. Mr. LANDER THOMSON gave a lecture entitled,

#### A RAMBLE THROUGH FLORENCE,

which was illustrated by numerous lantern slides of excellent quality. The lecturer dealt largely with the architectural and art features of the city, explaining the position which Florence occupied in the world of art, and alluding to the influence of these art treasures on the people. Mr. EDDINGTON, in closing the Exhibition, stated that it was the most successful yet held by the Society in regard to the attendance of the public, the sale of catalogues also being unprecedented, a third edition having to be printed. The lantern was skilfully manipulated by Mr. Banks and Dr. H. Scott Lauder, R.N.

#### FORTHCOMING EXHIBITIONS.

1899.

- |                   |  |  |
|-------------------|--|--|
| March 3, 4 .....  | Birmingham.  | C. J. Fowler, Court Mount, Erdington, near Birmingham.                     |
| " 4-11 .....      | South London.  | Hon. Secretary, A. E. Allen, 27, Princes-square, Kennington Cross, S.E.    |
| " 14, 15 .....    | G.E.R. Mechanics' Institution (Photographic Section), Stratford, E.  | Hon. Secretary, H. W. C. Drury, St. Oswald's, Downs-road, Clapton, N.E.    |
| " 15, 16 .....    | Brentford.   |  |
| " 20-May 13 ..... | National Trades and Industrial Exhibition, Bingley Hall, Birmingham. | Manager, Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C. |
| April 3, 4 .....  | Beverley.  | T. J. Morley, Toll Gavel, Beverley.  |
| " 12, 13 .....    | Plymouth Photographic Society.                                       | Hon. Secretary, W. H. Harris, 91, Cobourg-street, Plymouth.                |

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### WANTED A CHEAP ROLLABLE FILM.

To the EDITORS.

GENTLEMEN,—Their great and sudden success has shown that the new type of slow bromide papers has met a want which the photographic public had to look to other than our home manufacturers to imitate. Might I point out another great want, particularly of the amateur, in which it would appear that Continental makers will be first in the field, viz., a cheap rollable film. That it is used in the most expensive as well as the cheapest hand cameras, and the great variety of beautiful and convenient instruments of all kinds on the market to which it is adapted shows that in its universal applicability it is *facile princeps* as a means of carrying sensitive material.

But the amateur who is blessed with not too much worldly wealth recollects, as he surveys the tempting arrays of extra good value, pocket kodaks, cartridge kodaks, &c., that films costs three times as much as plates, and such luxuries cannot be for him. A stripping film on paper would (in the absence of something more convenient at the price) most nearly meet the needs of the case. The transference of the negative film to a glass basis ought to be done just as easily as the similar operation in carbon work, and form merely a detail in negative-making. In keeping qualities such a film ought to equal good bromide paper, which is practically equal to that of plates, and it would be proof against halation. Instead of costing three times as much as plates, it ought to cost considerably less.

If such films were put on the market, many would be able to convert their stand cameras into very efficient hand cameras at a small cost by means of the roll-holders, which can now be got very cheap.—I am, yours, &c., H.

#### PYRO AS A LANTERN-SLIDE DEVELOPER.

To the EDITORS.

GENTLEMEN,—Referring to Mr. Armstrong's letter in your JOURNAL of February 24, I can endorse all which he has said in favour of pyro for lantern slides, and add that the quicker developer is also greatly in favour of pyro as compared with hydroquinone, but I have been obliged with reluctance to give it up entirely owing to unevenness in development. I used ammonia, and I have found that sometimes, and very often, one



spot will develop quite densely before another portion commences to show much sign of starting at all.

I thought it might be due to improper mixing of the ammonia or unevenness of applying the solution, but no care in remedying these possible causes of the defects produced any better results. Then I thought that the film might be harder in some places than in others and to remedy this I tried soaking the plates in water and in plain pyro solution before applying the developer, but with no better result, and I was obliged to give up pyro altogether. The reading of Mr. Armstrong's letter revives the hope that I may be able to discover the cause of the trouble or to discover a plate on which I may work with success, for the pyro tones are just those which I like beyond all others. I have never tried soda as an accelerator with pyro.

I shall be much obliged if Mr. Armstrong can throw some light on these points.—I am, yours, &c.,

LOUIS MELDON.

31, Arisburry-road, Dublin, February 25.

### RETOUCHING WITH A PIN POINT.

To the Editors.

GENTLEMEN,—Apropos of Mr. T. M. Laws's note on the above, the enclosed little metal pencil may interest you. It is one of several made for me about ten years ago by Mr. A. Fenton, photographer, of Chester-le-Street. Mr. F. used them himself, and, I believe, sold them occasionally to those in want of an "easy retoucher."—I am, yours, &c.,

J. PIKE.

[We should think the fine-pointed metal pencil, which Mr. Pike kindly encloses, very useful for the purpose.—Eds.]

### THE FOCAL LENGTH OF A LENS.

To the Editors.

GENTLEMEN,—Mr. Dallmeyer's solution of the problem of measuring the focal length of a lens is perfectly satisfactory from a theoretical point of view, as, indeed, might be expected; but I have always found a practical difficulty in measuring the distance of the ground surface of a camera screen, when *in situ*, from any point outside the camera, and, of course, it is still more difficult to get the distance when both points are inside the camera. By making a variety of measurements and combining them, it can, of course, be done; but I did not think that procedure would suit those for whom I was writing, nor did I desire to trouble ordinary photographers with focal centres.

Allow me to suggest that opticians should adopt the practice laid down by the Paris Photographic Congress in 1887, and mark on the lens-mounting the place of one of the centres at least, adding the distance between them, as well as the focal length of the lens. When the centres are outside the limits of the mounting, its distance from a marked point might be given. Enlargers would thus have available all the information they require without any special investigations. It is true the enlargers are but a minority of the users of lenses, but the information could hurt no one.—I am, yours, &c.,

J. F. T.

### SACRED ART AND PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—The first four paragraphs of Ex Cathedra, your views and mine are thoroughly in accord. I know every one will not think the same, but I feel convinced your view of the subject is the right one, and so I speak.—I am, yours, &c.,

W. W. WINTER.

Midland road, Derby.

[A number of other letters, which the writers do not wish published, have also reached us, from which we have been pleased to find that our remarks have met with wide approval.—Eds.]

### CHEAP ENLARGEMENTS.

To the Editors.

GENTLEMEN,—Thinking it might interest you, I have sent you a circular emanating from the oldest established grocers in this city, and should be glad to have your opinion as to the best course to adopt to show them up, there are no less than ten or a dozen photographers in this city, and all classes are well catered for. I thought I should do one or two 12 × 10 bromide enlargements, and ticket them at 4s. 6d., and put the firm's circular one side of them and one of my own stating price, and with the intimation that I did not expect my customers to buy a pound of tea. Trusting I am not intruding too much on your valuable time, and any suggestion you can offer me will be very acceptable.—I am, yours, &c.,

ARTHUR A. NOAKES.

17, St. Peter's-street, Canterbury, February 21, 1899.

[The circular relates to the offer of 20 × 16 enlargements for 5s., and suitable frames for 4s. 6d., both of which can be very profitably produced at the prices. The best and indeed the only useful advice we can give our correspondents and others similarly situated is to

turn out work superior to these enlargements—to compete, in fact, both as regards quality and price. This is the surest way of making and retaining business. If the cheap enlargement schemes are the means of waking up photographers to the enormous possibilities of high-class portraiture, &c., they will ultimately prove blessings in disguise.—Eds.]

### COLOUR PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—The enclosed cutting was taken out of the "London letter" column of a local evening paper, and, as the writer of the paragraph states he had a specimen of the work, and pronounces it "a very creditable piece of photography, the colours coming out marvellously," perhaps the process has come under your notice, and you can enlighten us somewhat as to the merits of the work, or whether there really is anything in it or not. The "invention hailing from America," from which it differs "in many important respects," puzzles me a bit, as I think I have read in your JOURNAL that this is merely a repetition or modification of the three-colour processes. And what about the wonderful "Newquay" process of colour photography—the process above all processes which was to revolutionise the art of photography, and place in the hands of every photographer a simple and certain method of producing photographs in natural colours? "Cosmos," in his Jottings, rather shatters our long-cherished hopes when he speaks of "reserving his colour-photography reminiscences for his autobiography."—I am, yours, &c.,

Newport, Mon., February 21, 1899.

T. M.

[Appended is the paragraph our correspondent was kind enough to enclose. We have heard nothing of the "intelligent Russian peasant's" system of colour photography. On the latter subject the London correspondent of a provincial newspaper is, perhaps, the one authority least deserving of respect.—Eds.]

"CAZAR AND PHOTOGRAPHY.—The Czar is taking a paternal interest in other things besides disarmament. An intelligent Russian peasant has, I hear, invented a system of colour photography, and has been placed by the Czar in a position to perfect his appliances. I have had an opportunity of seeing one of the specimens of the man's work sent over to England for inspection. It is a very creditable piece of photography, the colours coming out marvellously. Details of the system have not transpired, but I am told that it differs in many important respects from the invention hailing from America."

### AN ALUMINIUM MICROSCOPE STAND, &c.

To the Editors.

GENTLEMEN,—In a recent issue of the JOURNAL I saw a notice of a microscope stand constructed of aluminium, excepting the working parts, which had been exhibited at the Quekett Microscope Club, and conveying the impression that it was an entire novelty. Since this instrument was antedated almost a quarter of a century, to my personal knowledge, it may not be uninteresting to your readers if a few particulars of this, perhaps the first microscope constructed of aluminium, be given in your columns.

In the spring of 1894 the late Mr. Joseph Beck, of the firm of R. & J. Beck, making one of his visits to this country, brought with him one of their "Large Best Binocular Microscopes," with a full outfit of accessories, and a set of objectives from a four-inch to a one-fortieth of an inch, every portion of which, excepting the working parts, was constructed of aluminium. All of this apparatus, stand, accessories, and objectives, was "packed portably" in a single case of mahogany, so light that it could be carried by one hand, readily, as an ordinary portmanteau. In the autumn of the same year I took this outfit to San Francisco, where it was left with a member of the Microscopical Society of that city for the consideration of 1800 golden dollars, duty paid.

I also noticed in your issue of January 13, some commendatory remarks as to the Velox printing paper, which I can most heartily endorse. For the perfect rendition of the delicate details of a photo micrograph I have never seen any printing medium (with the exception of glass) at all equal to it, whilst the ease of manipulation must recommend it to every user. And here, perhaps, I may give a hint to fellow-workers that will prove useful. The most perfect finish to be obtained with this, as well as with all other enamelled or glossy-surface papers, is had by squeegeeing them upon an ordinary ferrotype plate, from which they should peel off when dry, smooth, glossy, and perfect; but, alas! how frequently doth a print "stick faster than another," refusing to leave the plate, ruining not only itself but the placid temper of the operator as well. Being greatly troubled in this direction at times, I set about discovering a remedy, and found it. If the prints, after being duly fixed and washed, be transferred to a bath of one drachm of formaldehyde to eight ounces of water, for a few minutes, they may be squeegeed on a clean ferrotype plate with the absolute certainty of coming off when dry. Having treated several thousand prints in this simple manner without a single failure, I am enabled to speak positively as to its success. But the plate must be clean.—I am, yours, &c.,

W. H. WALMSLEY.

4248, Pine street, Philadelphia.



## THE R.P.S. AND PROFESSIONAL PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—I think we owe a debt of gratitude to THE BRITISH JOURNAL OF PHOTOGRAPHY for the publication of a letter signed "Pro bono Publico."

If the anonymous conceived the letter for "the good of the public," your valuable paper contained it "for the good of professional photographers."

I do not dare to discuss the first part of the letter in question, as I am in no position to judge the actions of the Royal Photographic Society, and therefore my belief in this high institution cannot be shaken, but it is the second part, dealing with the "make-belief amateur," which deserves to be printed in red letters, and be quoted in all the photographic journals of Great Britain and the Continent as a most useful contribution to a Correspondence column. Appeals, like "Pro bono Publico's," should be received with enthusiasm, lead to an open discussion of the subject, and to a consequent amalgamation of men who have learnt and do understand this branch of work in such an enormous field as photography.

There are a few Continental societies trying to protect the photographer's assistant from cheap competition, but there are none to protect the real professional photographer from the amateur who opens a photographic studio without knowing how to develop a plate properly. No wonder advertisements appear in photographic journals, asking for "attractive show-case specimens" cheap!

You do not agree with "P. B. P." in his criticism of the Royal Photographic Society. Well, this question will have its pro and con, but I take it as granted that you published the letter on account of the second question raised, which deserves public attention.

The second question, pronounced as a subject of manifest importance, which will advance the material interests of the profession. I think it will do more; it will raise the artistic quality of photographic trade productions and restore the good name of the profession in the eyes of the general public, which had reason to regret that we allowed our profession being dishonoured by individuals "Pro bono Publico" letter deals with.

As efforts in the indicated direction will not meet with general acclamation, why not fight with "open vigour" in a struggle to regain what's temporarily lost?

Names of some prominent photographers attached to their contributions would give confidence and courage to their minor brethren, who are, perhaps, too modest to raise their own voice in such important a dispute. A leader will easily be found amongst them, and then let us act *viribus unitis*.—I am, yours, &c.,

HENRY O. KLEIN.

Surbiton.

## THE LEEDS CAMERA CLUB AND THE YORKSHIRE PHOTOGRAPHIC UNION.

To the Editors.

GENTLEMEN,—Mr. Ezra Clough, seeking, like Alexander, for new worlds to conquer, and with his appetite whetted by the wholesale slaughter of Editors, Frank Sutcliffe, and suchlike big game during the last few months, has condescended to stoop down to such insignificant sport as a correspondence with me. Of course, in the natural order of things, the supply of lions could not be equal to our gallant Tartarin's demands, but I scarcely anticipated so early an attention, and I am correspondingly flattered by the distinction.

I and my Society, the Leeds Camera Club, have ventured to differ from Mr. Clough on the question of the advisability of our joining the Yorkshire Union of Photographic Societies, and the result is a round of blank across our bows.

In reply, personally I again repeat that federation has failed in Yorkshire, and I particularise, as an instance, when it was attempted by the Affiliation Committee of the Royal Photographic Society, and when a local sub-Committee, with a local Secretary who was a fellow Clubman and personal friend of Mr. Clough, was appointed some years ago, and has since not been heard of. I also say, in confirmation of what I have previously said, that societies are conflicting atoms, just as Mr. Clough is, and that personally I should be very sorry if any of my own Club was not, inasmuch as quiescence means standing still, and standing still means retrogression; that the proposed Union is itself an instance, inasmuch as it is founded, to a great extent, on feeling, and openly enters into rivalry with the Affiliation scheme. I say that the inception of the new Union was a mistake, by Mr. Clough's eight geniuses, who were all Bradford men, and who, with the help of other Bradford men, proposed, seconded, and appointed the Chairman (another Bradford man) and the Secretary (another Bradford man), and the subsequent hole-and-corner-proposed appointment, too, of myself as Treasurer by this self-ordained covenant, had a little too much of the same flavour to be satisfactory or to inspire confidence. Though Mr. Clough will perhaps not realise it, too much Bradford is apt to pall, and it palled first time on us. As to the practicability of a scheme wherein you are to have two sets of lectures, paid and unpaid; where every society is to have two

lectures free, and an equal number in addition for every lecture given by it to the Union; in other words, where the miracle of pouring a quart out of a pint jug is to be attempted; where, with twelve societies, and a subscription by them of certainly under 10L., it is proposed to pay a secretary, and run the show, time will prove. As it is, we propose to run "on our own," and I know of no section in the statute-book to prevent us.

I should be failing in that courtesy which is essentially characteristic of Mr. Clough if I did not thank him for the warning he gave me some time ago of the proposed "go for me," and, if he thinks that the game, be it either the Yorkshire Union game or the Ezra Clough game, should be necessarily played in this manner, let me assure him I have no objections. Your feelings towards Mr. Clough are of the most sympathetic description. I realise that, like the colt in the spring-time, he, overcome by his feelings and surroundings, is kicking and galloping over the greensward. I should suggest he should kick his heels now for all his worth, for very soon he'll be harnessed to the Yorkshire Union, and then there'll be an end to any colt's tricks.

Thanking you in anticipation for the demand I have made on your valuable space,—I am, yours, &c.,

W. J. WARREN.

Bedford street, Leeds, February 26, 1897.

## AN ASSISTANT'S DILEMMA.

To the Editors.

GENTLEMEN,—On perusing the pages of your JOURNAL, which I take every week, I came across a paragraph—"An Assistant's Dilemma," and, as my case is very much the same, I cannot help but replying.

About six weeks ago I sent you some of my work upon which to express an opinion and your reply was, "Although it was not the highest-class work yet it was very good class indeed." Now, since then I have answered three or four advertisements in your paper every week, but without success, and I cannot understand it at all. I do not ask a large salary, in fact perhaps too low. I am not only a good retoucher, but good operator and also miniature painter, and yet cannot obtain an engagement so "W" need not be disheartened. The only reason I can give for it is that either this country is overcrowded with good photographers or some of the advertisers are humbugs. I am afraid there are too many in the same fix. I should very much like to see a reply from one or two other assistants as to their opinion on the subject. Trusting you will be able to find space for this, and thanking you for same,—I am, yours, &c.,

F. S.

## NORMANDY.

To the Editors.

GENTLEMEN,—I am thinking of spending a few weeks in Normandy, going by the Newhaven route to Dieppe. I should be pleased if, through THE BRITISH JOURNAL OF PHOTOGRAPHY, some of its readers would kindly give me a little information respecting the places to visit on the coast, accommodations, &c. I am taking with me my hand camera, and would like to find out those old-world places and fishing villages with those quaint, picturesque fishing folk; also any information respecting permits to use my camera, and so forth, hotels and their charges.—I am, yours, &c.,

RAMBLER.

[Will some reader who has been fortunate enough to have the opportunity of photographing in Normandy oblige our correspondent with the information asked for?—EDS.]

## "ROUGH ON THE CRIMINAL."

To the Editors.

GENTLEMEN,—Does not the following paragraph from Monday's *Daily Telegraph* strike you as very hard on the criminal?

## CINEMATOGRAPHING A MURDER.

St. Louis (Missouri), Sunday.

During the trial yesterday of a man named Campbell Allgair for murder the prosecution introduced a set of cinematograph pictures giving the entire scenes of the crime. The instrument, which was kept in the room where the murder was committed, happened to be working at the time, and recorded the details of the killing. The lawyers for the defence say that if their client is convicted they will appeal against the use of the photographs as not being, in this instance, among the evidence legally allowable.—*Dakrid*.

I can't say I have much sympathy with murderers, but I do hope the love of fair play so dear to Englishmen will always induce them, when they have a cinematographic apparatus that happens to be working, to put up a notice—

## BEWARE OF THE CINEMATOGRAPH.

Dion Boucicault's absurdity in his play of the *Octoroon* isn't "in it" now.—Next, please!—I am, yours, &c.,

FAIR PLAY.



## AN OFFER OF ASSISTANCE.

To the Editors.

GENTLEMEN,—Should you at any time be applied to for information respecting India (or the East in general) by your subscribers—professional or amateur—I should be happy to be of service, having just returned from that hemisphere, having terminated an engagement lasting three years. By so doing I trust I can further, in some slight degree, the resources of THE BRITISH JOURNAL OF PHOTOGRAPHY, which publication I have found invaluable, and the which is to be discovered in the remotest corners of civilisation.—I am, yours, &c.,

ARTHUR CECIL COLE.

224, Earl's Court road, Kensington, February 26.

## Answers to Correspondents.

\*.\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\*.\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\*.\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

## PHOTOGRAPHS AND DRAWING REGISTERED:—

E. C. MacMahon, 23, Academy-street, Inverness.—Drawing of railway show-card.

A. J. Ashbolt, 29, High-street, Southampton.—Photograph of the Southampton Foot ball Club cup-tie team, 1898-9.

Jesse Landon, 134, Queen's-road, Watford, Herts.—Two photographs of two young rats in one trap; back and front views.

H. A. Chapman, 235, High-street, Swansea.—Two photographs of underground chapel used for divine service in Mynydd Newydd Colliery, near Swansea.

F. H. CARTER.—Many thanks for your letter.

G. S. C. (BURY ST. EMUNDS).—The address of the agent for the lenses is Mr. H. F. Purser, 33, Hatton Garden, E.C.

ONE IN DOUBT.—Peruse the Copyright Act in the ALMANAC for 1899. To make assurance doubly sure, the register should be consulted.

T. M.—So far as we know, no patent is in force for the device described, which we have seen applied to many cameras other than those of the makers named.

E. H. MICKLEWOOD.—See a reference to the subject elsewhere in this number. The films are not yet obtainable in Great Britain; they will probably reach here shortly.

"REGISTERED."—S. H. HART says: "Will you inform me whether it is necessary to have the word 'registered' printed on the mount when a photograph has been registered?"—In reply: No, not necessary.

COMBINED BATH.—A. S. B. says: "Would you kindly give me a reliable formula for combined toning and fixing for gelatine prints—preferably one without alum or lead, and if possible a neutral bath."—It is a very vexed question, and always has been whether any combined toning and fixing bath is reliable. The best are those given in the ALMANAC. The old combined toning and fixing bath, universally used in the early days of photography, and which yielded prints many of which are now as good as when first done, was hyposulphite of soda, 12 ounces; water, 1 pint; chloride of gold, 15 grains. That was for albumen or plain salted paper and contained neither alum nor lead. But we doubt if the present gelatine papers will stand such a bath.

COPYRIGHT.—GWALIA says: "Would you be so kind as to answer these questions? 1. I photographed a rocket brigade recently. I have sold thirty copies of whole-plate for 2s. each. I gave them a 12×10 bromide enlargement, worked in black and white, gratis; they are going to present it to the late first officer, who resigned recently. Can I copyright same, and which way shall I proceed to do so? 2. I wish to join the Copyright Society; what course shall I take to become a member?"—1. You can register (copyright) the photograph if you were not paid for taking it. Send our publishers three prints and 1s. 7d., and they will effect registration for you. 2. Address Mr. Henry Gower, Photographic Copyright Union, London Chamber of Commerce, Botolph House, Eastcheap, E.C.

OWNERSHIP OF STUDIO.—A COUNTRY PHOTOGRAPHER says: "In your Answers column a correspondent, Edmond Wallis, asks about the ownership of studio. I have always understood that anything put up for business purposes could be removed; that has been my experience. I have built three studios. The first the landlord bought to turn it into a greenhouse when I left. The second I had pulled down myself, although I am not aware, or rather I forget, if anything was said about it in the lease, and I shall have no hesitation in pulling down the third if I want to."—In reply: As we said, the law is a little knotty on the point. We thank our correspondent, but neither of his cases was contested in a law court. What are and what are not tenants' fixtures is often a very vexed question.

SPOTS ON PRINTS.—VERAX says: "Will you kindly give me your opinion as to the cause of these spots appearing on a lot of my prints? Process: albumenised paper, sensitised by Blackfriars Company; acetate of soda toning bath. Mountant: starch."—This is one of the unanswerable questions dealt with in our issue for February 10, to which we would refer our correspondent. The spots are clearly due to the manipulations, and several laches in them would produce similar spots. The paper, toning bath, or the mountant have nothing to do with the trouble.

COPYRIGHT.—B. H. There is no question about the copyright and its registration, if the facts be as stated. We should recommend you at once to take proceedings for damages and an injunction to restrain further issue of the publication. There is very little doubt that, when proceedings are commenced, the publishers will drop their "bluff" and be very anxious to come to terms with you. If the case goes into Court, which they will not be foolish enough to allow, you will secure substantial damages. But lose no time in applying for an injunction to restrain further publication.

GELATINE; CHONDRIN; BROWN MARKS ON PRINTS.—A. BAKER says: "I see by your JOURNAL of September 23, 1898, you believe there is one firm that makes photo emulsion gelatine in England. Will you kindly give me the address? I think my failures are due to bad gelatine. 2. Will chondrin form in a white lump when a concentrated solution of chrome alum is added? 3. Can you tell me the cause of the brown marks on the enclosed prints?"—1. We do not now know of any firm that supplies gelatine emulsion. 2. Chondrin is precipitated by alum. 3. Carelessness; allowing the prints to stick together in the fixing bath.

INTENSIFICATION.—G. B. says: "I have tried the intensifier as recommended by Mr. Bolton in your JOURNAL a fortnight ago. I added two or three successive ten drops of intensifier to the pyro-ammonia developer, and left the plates in bath ten or fifteen minutes altogether. Result: 1. No appreciable intensification. Why? 2. The plates were covered with patches of metallic silver. Why was this? 3. Would a weak solution of iodine, followed by cyanide, remove hypo from a plate? 4. And is a trace of cyanide injurious to the ferrous-oxalate intensifier?"—1. We cannot say the reason of the failure. 2. This was, in all probability, due to the vessels not being thoroughly clean, and a similar cause may account for failure No. 1. 3. If by "hypo" is meant hyposulphite of soda, water alone will remove it. 4. Yes.

FOCAL LENGTH OF LENS; SHUTTER.—THOMAS ROGERS says: "1. I have just bought a hand camera, Fallowfield's Facile, which has a view lens and one fixed stop three-eighths of an inch in diameter, and am anxious to know the true working aperture of this lens. The distance from the plate to the inside face of lens is exactly four and five-eighths inches, and one inch from this comes the diaphragm. To obtain the focal length of this lens, from what point must I measure? 2. Enclosed please find drawing of the shutter which works in front of the diaphragm. Can you tell me whether the efficiency of this shutter is as high as a roller-blind shutter, such as a Thornton-Pickard? If not, perhaps you may be able to suggest some means of fitting such a shutter in place of the one at present fitted, as the space between the stop and inside front of camera body is less than one-eighth of an inch? The drawing is the exact size of the original. You may know enough of this particular camera to be able to recommend it, or to give your opinion as to whether it can be used as a practical camera. This last four years I have only used half-plate stand camera, and should like to go in for hand-camera work as well, but am afraid, with this lens and shutter, I shall get many under-exposed negatives, using Castle plates."—1. According to these measurements, the aperture of the lens is, roughly,  $f/13$ . 2. It is very good for a cheap form of shutter. Doubtless the makers of the camera could fit the other shutter you mention to the camera. The camera is one with which excellent pictures can be taken, and it can be fitted with a lens of the rapid-rectilinear type, which will, of course, work much quicker than the single one with which it is now furnished.

DETENTION OF NEGATIVES.—L. L. says: "May I trespass on your time and kindness to give me an answer to the following statement of facts? In October, 1895, I was in business as photographer in Newport, Mon. In that month a traveller from — received from me two negatives for enlarging, and in a day or so received from the firm an acknowledgment of my order. But I never received either negatives back or enlargement ordered, and after writing them once or twice I let the matter rest. Since then I have sold my business and come to Manchester in the employ of a firm of photographers. The other morning I opened a parcel containing a specimen enlargement sent to my firm by —, and there was a nicely coloured enlargement (12×10) of my daughter, the negative of which was one of the two I had sent to the first-mentioned firm more than three years before. Now, it seems to me there is a nice little bit of roguery here. I have not the slightest doubt but that other photographers have suffered in the same way. Naturally, I should like to make these people pay. I have an idea the two firms are one and the same. Have I any case? Should I proceed against the first for detention of negatives, or against the second for publication of work that is mine? And I suppose a solicitor would be the best to undertake the case? Or don't you think it is worth the trouble? There is an undoubted fraud somewhere, and, as an Englishman, I don't like being done. I can, of course, give you fuller details of the matter, if you care to have them, as you may, being of interest to the profession generally."—We certainly endorse the opinion expressed by our correspondent. It seems to us that the only remedy is to sue those to whom the negative was originally intrusted, whether they be the present Company or not, if he can find out who they are. Unless our correspondent can find out something about the people beforehand, it might be a waste of money to put the matter in the hands of a solicitor, who will, of course, have to be paid.



# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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## EX CATHEDRA.

It has been estimated that the gelatino-chloride process supplies seventy-five or eighty per cent. of the sensitive printing paper used by photographers. Next to dry plates, it is probably the largest item of photographic manufacture and trade. No great amount of imagination, therefore, is needed to realise that an increase in the price of gelatino-chloride paper would be a very serious thing indeed for those who make it and those who use it. We gather that such an advance is well within the bounds of probability in Great Britain; it has already taken place in the United States, and, we believe, on the Continent. In America, according to our exchanges, the matter has given rise to considerable ferment, and no wonder.

\* \* \*

THE effect of an advance in price of British-made gelatino-chloride paper would mean the dislocation or the disturbance of a very important branch of manufacture. If the photographer is called upon to pay 1s. 3d. for what he has hitherto been in the habit of paying 1s.—to state the case in the form in which it is most likely to occur—his preference for gelatino-

chloride printing might be somewhat difficult to sustain. It can easily be supposed that he would not only revolt at the increased price, but would be induced, without difficulty, to transfer his allegiance to a printing process which would supply a substitute for gelatine at perhaps half or two-thirds its cost—albumen, for example, which would then stand a great chance of being more than temporarily resuscitated. Thus, the object of those upon whom the responsibility of raising the prices of gelatino-chloride would rest might not, in the end, be achieved; gelatine would be replaced by albumen, the manufacture of the former would be decreased, and albumen paper would again be worth the attention of English sensitisers working on a very large scale. If this inevitable result of a rise in price of gelatino-chloride paper has not been foreseen by those who are alleged to be contemplating action in the matter, they may acknowledge that, in calling their attention to it, we have taken a course not altogether inimical to their interests. In the long run we are convinced that neither photographers nor the public would be the sufferers by a rise in price of gelatino-chloride.

\* \* \*

WE are informed that ill health obliges Mr. George H. James shortly to leave England for a time. Mr. James is known and esteemed by a wide circle of friends. An old member and past President of the West Surrey Photographic Society, he has worked hard for years in his own immediate neighbourhood to promote the interests of photography, of the pictorial side of which he was always a cultivated and prominent exponent. As an experimentalist in carbon printing, he was led, last year, to work out the adaptation of the gum-bichromate process to commercial requirements, and with considerable success. It is to be hoped that Mr. James will not long be absent from England, as good workers of his stamp are none too plentiful in photography. On Wednesday evening last the members of the West Surrey and numerous friends gave a farewell entertainment to Mr. James, who was the object of many manifestations of goodwill and hearty wishes for a speedy return to health.

\* \* \*

MESSRS. CATHERALL & PRITCHARD, Ltd., photographic publishers, of 326, Camden-road, N., and Chester, write: "On several occasions of late you have drawn attention, in the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY, to the revival of



stereoscopic slides, and have instanced the efforts of one or two firms to provide them at an extremely low rate. These productions are usually in colotype, or some similar mechanical process, and, when taken in bulk, are often very uneven in quality, as the low price precludes any rejection of inferior prints. Some months ago we decided to again take up the production of stereoscopic slides, and to issue a really good slide at a price but little in advance of the colotype slide. You have always shown such interest in stereoscopic work, that we have much pleasure in submitting to your notice some slides we are now issuing to the trade in silver, and which have as careful work put into them as at any time in our history."

\* \* \*

THE series of slides Messrs. Catherall & Pritchard have been good enough to send us illustrate Welsh and Devonshire scenery, and the subjects lend themselves admirably to binocular treatment, the views having been chosen with an eye to securing natural effects of relief and solidity. The prints are on albumen paper, and better images for the purpose could not be desired, every detail in the shadows being shown and the high lights stopping short of hardness. We are always glad to have evidence of an increasing interest in stereoscopic photography, and help promote its popularity; and such beautiful slides as those which Messrs. Catherall & Pritchard are issuing should materially aid us in our efforts on behalf of this fascinating branch of work.

\* \* \*

IT may be remembered that, on February 21, a meeting convened by the National Photographic Record Association was held for the purpose of discussing the means to be adopted for securing photographic records of old and disappearing London. The tangible result of that meeting was the formation of a committee whose duty it should be to arrange details of procedure. We here give the names of that body as it is at present constituted, but it is probable that some additions will be made to it:—Rev. J. O. Bevan, F.S.A.; Messrs. F. Goddard, South London Photographic Society; W. R. Stretton, Photographic Club; J. T. Price, West Surrey Photographic Society; E. Eastwood, Lewisham Camera Club; H. B. Wheatley, Society of Arts; J. W. Thomas; C. R. Ashbee; Col. J. Waterhouse, R.P.S.; W. Oxley; Philip Norman, F.S.A.; Dr. Mill, F.R.G.S.; R. Nevill, F.S.A.; Basil Lawrence, Camera Club.

\* \* \*

THE Pennsylvania Academy of the Fine Arts announce that, under joint management with the Photographic Society of Philadelphia, the Philadelphia Photographic Salon for 1899 (second year) will be held in the galleries of the Academy, from October 22 to November 19, 1899. The success of the first Salon has conclusively demonstrated the existence of a field for an American Exhibition devoted exclusively to pictorial photography in its highest sense. The aim of the Salon is to show only such pictures produced by photography as may give distinct evidence of individual artistic feeling and execution, rigidly selected by a jury composed of well-known artists and artistic photographers, whose certificate of acceptance shall be the only award. All those interested in the purpose of the Salon are invited to give it their cordial support and encouragement, both by submitting specimens of their best recent work and by making it favourably known to others. This preliminary notice will be followed in due course by a full circular, with all details, entry forms, &c.

IT is announced in *Nature* that, in order to afford the members of the Franklin Institute, Philadelphia, the opportunity of cultivating an interest in photography and microscopy, with especial reference to the branches of photographic optics and mechanics, photo-micrography, photo-chemistry, and their manifold applications to the various branches of the arts and manufactures, a photographic and microscopic branch of the Chemical Section is being organized. Of interest in connexion with this movement is the fact that the Chemical Section of the Institute has lately become the residuary legatee of the large and valuable accumulation of scientific books and physical and chemical apparatus of the late Mr. Matthew Carey Lea, who, in his day, as our readers know, was one of the foremost experimentalists in photographic chemistry.

\* \* \*

OUR contemporary also states that at the meeting of the Franklin Institute, Philadelphia, on February 15, Mr. L. E. Levy exhibited and described the acid-blast process invented by him to facilitate the etching of photo-chemical engravings. The invention consists essentially in the application of a spray of finely atomised etching liquid instead of the immersion bath at present in use, the spray being driven against the plate by a powerful blast of air from an air-compressor. Under the impulse of the blast the etching proceeds very rapidly. The heat evolved by the rapid chemical decomposition of the metal is absorbed by the expansion of the compressed air as it escapes into the etching compartment, and this results in keeping down the temperature of the plate and the etching liquid to a normal degree. As each succeeding globule of acid impinges on the metal in the direction in which the etching is required to proceed, the process can be continued to a depth beyond which the finer and closer lines of the design would become too frail to bear the strain of printing, and at that point the etching is stopped and the finer lines are protected by powdering in the usual way, after which the etching can be carried to the requisite depth. Attached to the etching box is a washing compartment, into which the plate-carrier is slid when the etching liquid is to be washed away from the plate.

\* \* \*

WE understand that an Exhibition of acetylene gas and the methods of producing it will be held at Budapest during May 14–28. The Exhibition is divided into two groups—the "manufacture of carbide of calcium" and "acetylene lighting," which are subdivided so as to include everything at present devised in connexion with acetylene gas. Particulars can be obtained from the President, M. Maurice Gelléri, Budapest, VI. Uj-utca 4.

\* \* \*

A PARIS correspondent says that by slow degrees the photographs of M. Loubet are replacing those of M. Félix Faure in the shop windows and the kiosks. The counterfeit presentments of the late President, however, will preponderate for some time, as it is evident that the shopkeepers want to sell off the large quantities of them which they have on hand. Half-size photographs of M. Loubet, wearing the broad sash of the Legion of Honour, have in the mean time been sent to all the Ministers and their principal secretaries. Engravings of the same portrait are to be forwarded in a few days' time to all high public officials and to the Prefects of Departments.



## THE DETENTION AND MISUSE OF NEGATIVES.

LAST week we, in the Answers column, replied to a correspondent; his complaint was this: A few years ago he intrusted to a traveller for a "firm"—now, we think, defunct—two negatives for enlargement, one of them being of his own daughter. In due course he received an acknowledgment of the order, but he was unable to get the enlargements or the negatives back. The other day, at another place, he opened a parcel containing a specimen enlargement sent by another "firm" and to his astonishment found it contained a coloured enlargement of his daughter's portrait from one of the two negatives sent to the other firm three years before, the names of the two firms being given. Now, it is very clear that he could sue the "firm" to whom the negative was intrusted for its illegal detention, and also damages, if it is in existence or he knew who the "firm" was, or is, and would get redress if the concern were worth "powder and shot." With regard to the second firm that now have the negative, and are trading upon it, he could, no doubt, obtain an injunction to restrain its further use, but that would entail considerable law costs, which some one would have to pay, the losing party if they have the means.

This subject opens up a question of some interest. The negative of a sitter is the unquestionable property of the photographer, but he cannot use it for any purpose of his own against the will of the sitter. He sells his business, and with it the negatives, and, presumably, his successor will follow the same course in his own interests. But assume that the photographer who took the negative becomes bankrupt, and his effects, including the negatives, are sold at auction, and are purchased by different people, what then? Are the purchasers restricted from putting them to any use they may think proper? This question occurred to us some time back when, on walking through the Friday market in the Caledonian-road, we saw packets of negatives of the nobility we recognised as being taken by a West-end house that had "come to grief." The names of the sitters were upon them, and they would have made excellent specimens for show-cases, and possibly have been utilised as such. Is there any law to prevent that, seeing that the negatives were sold in "market overt?"

A new Bill relating to copyright is just now being promoted by artists, and the Royal Photographic Society has appointed a committee to watch over the interests of photographers in the matter, and this point should receive some amount of consideration. It may be well to get a clause inserted in that portion of the Bill relating to photography, to the effect that it is illegal to use the negative of any sitter taken in the ordinary course of business, by any one into whose hands it may eventually fall, without the sanction of the sitter. This would be in the interests of photography, by inspiring confidence in sitters. In the case cited of the market, it would not be pleasant to the Countess of Sand-So, the Lady That, or the Honourable Miss Dash, to know that their portraits might figure as specimens in third or fourth-rate show-cases, or perhaps as "beauties" on match-boxes or in packets of cigarettes.

## VANISHING LONDON.

The efforts of Sir Benjamin Stone will, no doubt, be appreciated in securing a photographic record of rapidly disappearing buildings of historical interest—and none too soon—and every one will wish the idea the success it deserves. There are

many, however, who may desire to secure pictures of such objects for their own private collections. It is announced that the south side of that picturesque old London street, Holywell-strand, Strand, is expected by the London County Council to be cleared away before the end of the year. But, doubtless, long before that time, some of the shops will be closed and boarded up, or partially hidden by scaffolding. Therefore no time should be lost in securing what may be desired—i.e., views showing the street in its original condition. We would suggest with this street, as with several of a similar character, that the pictures be taken stereoscopically. This old street, with its continuous crowd of pedestrians and occasional stray vehicle or hand cart, makes excellent subjects—and there are several—for the stereoscope.

There is another phase of vanishing London that it will be interesting to secure photographic mementoes of while the opportunity lasts, namely, the congested street traffic in many of the London thoroughfares. There is now no question that, shortly, a great deal of that will be a thing of the past. Already the Strand, since the police have interdicted the "crawlers" from this thoroughfare, presents quite a different appearance from what it did a month or so back; and, when more traffic is diverted, the altered appearance of the Strand and other streets will be still greater, and the record of what they once were lost. Here, again, stereoscopic pictures will be the more interesting, and they may be easily secured with a stereoscopic hand camera. If they were, they would, by comparison with those taken by the late Mr. Wm. England, Blanchard, and others in the "sixties," show the difference between the London street traffic of 1899 and the period alluded to.

While on this subject, we may as well allude to another interesting spot, though not the London Strand, that is threatened, namely, Strand-on-the-Green. Kew Bridge, which, though not handsome in itself, yet makes an excellent distant background for views, looking up the river, of Strand-on-the-Green, is very shortly to be removed. It would have been done ere this but for some little hitch between the Surrey and the Middlesex County Councils. That is all arranged now, and the work is to be commenced at once. It was just mentioned that Strand-on-the-Green was also threatened. The local press is now calling attention to this neglected district and the unhealthy state of some of the dwellings there. If some of these old cottages are removed—and these, doubtless, will be—and modern dwellings erected in their place, Strand-on-the-Green will be lost to artists and photographers, to the former of which it has always been a happy hunting-ground, for, on a fine summer day, one rarely passes without seeing half a dozen or more at work, sketching or painting. At this spot a dozen or more excellent stereoscopic pictures—for it is admirably suited to stereoscopic work—may be obtained within a quarter of a mile; indeed, it is doubtful if so many good subjects for the camera are to be found in so small a space within half a dozen miles of the Marble Arch.

**Albumen versus Gelatine.**—The article by Mr. Edward Dunmore, in our last issue, should be read and duly considered by every photographer. Mr. Dunmore is an old hand and knows what he is writing about. He points out the weak and the strong points, dispassionately, of both the albumen and the gelatine printing processes, more particularly the probable permanence of the results. Mr. Dunmore dwells on the effects of carelessness in the working of both methods, and particularly points out the evil of long washing, or soaking, of albumen prints. As we have been saying for many



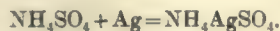
years past, the quicker albumen prints are washed, that is, thoroughly washed, the better it is both for the appearance and the stability of the results. Albumen may not, at present, be so largely used by modern photographers, particularly amateurs, as gelatine, but it is not yet dead, and we surmise that it will take a lot of killing before it becomes so.

**One-solution Sensitiser for Paper.**—Niewenglowski points out that the use of a single solution for sensitising paper was suggested by Liesegang in 1872, and that the following will give good results, provided a fairly heavily sized paper is taken and the sensitised sheets are used within twenty-four hours:—

Silver nitrate .....	3 parts.
Uranium nitrate .....	30 "
Distilled water .....	10 "
Absolute alcohol to .....	100 "

This solution must be kept in the dark or in a brown bottle, and the paper must be coated with the solution by gas or artificial light, and dried in the dark. A blue-black tone may be obtained by immersing in a solution of ferric chloride, to which a few drops of a solution of ammonium sulphocyanide have been added. It is advisable to wash the print in water acidulated with nitric acid at first and then in plain water.

**Ammonium Persulphate.**—Herr Schöncchen, writing in the *Photographisches Centralblatt*, states that this salt is made by the electrolysis of a solution of ammonium sulphate, and that Lumière and Seyewitz explain its reducing action on the silver image by the formation of a double sulphate of ammonia and silver according to the equation—



This explanation is, however, insufficient to account for several things that have been noticed, especially that fresh-made solutions will not act as reducers. From a series of experiments, Schöncchen states that an aqueous solution of the persulphate is gradually decomposed into ammonium sulphate, sulphuric acid, and oxygen, this being in the state of ozone—



Oxygen cannot act upon silver, but ozone will, and converts it into oxide or peroxide, which, *in statu nascendi*, would combine with the sulphuric acid and form silver sulphate.

**White Silver.**—The well-known French chemist, M. Mercier, states that, if a plate, normally exposed, be immersed in the following solution for one or two hours, a negative image is obtained which is white, but is so feeble as to be but of little use practically.

Sulphate or salicylate of eserine .....	1 part.
Metabisulphite of soda .....	2 parts.
Anhydrous sulphite .....	3 "
Carbonate .....	5 "
Water .....	100 "

Eserine, or, as it is sometimes called, calabarine or physostigmine, is the active principle of the Calabar bean (*Physostigma venenosum*).

**An Explanation Wanted.**—At the December meeting of the Namur section of the Association Belge de Photographie, M. Rousseau complained of the accidents which had befallen his prints which he had sent to the last Exhibition of the Royal Photographic Society. M. Rousseau stated (1) that one print had been pierced right through with a nail; (2) that three of his enlargements had been unmounted, spoilt, soiled, cut, and scratched, the frames destroyed and peeled off, and put together again in certain places; (3) the glasses were broken, and that there were no bits of glass in the packing, showing that this had been done before packing; (4) a frame so broken that it would not be possible to use it again; (5) and, lastly, a print had been taken from its frame; nothing better was found than to break the glass, and, as the print was pasted to its cut-out mount, it had been detached without any care, and it had

been rendered absolutely useless. These complaints were formally entered on the minutes and ordered to be published in the *Bulletin Belge* as an advertisement of the courteous method in which the Royal Photographic Society treated the prints sent to its Exhibition. M. Rousseau, we note from the catalogue, had no picture accepted.

**Rembrandt.**—There is at the present time to be seen a very fine collection of paintings by Rembrandt at Burlington House. They, with others, were shown last year in the Rembrandt Exhibition at Amsterdam. Amongst them are some lent by the Queen, the Duke of Westminster, the Duke of Devonshire, and others from their private collections. There is also on view—opened last week—in the gallery attached to the Print Room of the British Museum, a fine and large collection of drawings and etchings of Rembrandt's, also by some of his pupils and associates, as well as by members of his craft next to him in importance. Rembrandt's work, especially should be studied by photographers for its bold treatment of lights and shades, and the present opportunity, which may not occur again, should be embraced. Speaking of painting, it is announced that the Queen has promised to lend some of the best of her Vandyks for the Vandyk Celebrations at Antwerp in the early autumn. It may not be generally known that Her Majesty has, in her private collections at Windsor and Buckingham Palace, some of the finest Vandyks in this country.

#### VELOX FOR PROFESSIONAL WORK.

Few of us old professionals, a couple of decades back, could have imagined the conveniences we at present possess. Now almost everything is supplied ready for use, accompanied by full directions for its employment; indeed, there seems little left to learn in photography. How often have we sighed in the old days, during dark and foggy weather, for a paper with which good and uniform prints could be quickly obtained! Bromide paper we have had with us for some time, and, to an extent, it fulfilled that end. But, when the work had to be intrusted to some printers, who could ensure even a dozen prints all of equal depth and colour? or, if they were obtained, what was the proportion of paper wasted in obtaining them?

Now we have a new power at command in "Velox," which not only gets us over the trouble just referred to, while at the same time it yields just as pleasing results, so far as colour is concerned, as the old bromide papers. With the usual method of working, this paper yields a fine rich black, very similar to a platinotype. But, with a modification in working, which I shall presently refer to, any colour, from a bright Bartolozzi red, through sepias, to rich warm-brown blacks, can be obtained by development alone, without any after-toning, which closely resemble carbon pictures. Such is Velox paper, for which the old firm of J. J. Griffin & Sons are the agents. I cannot, of course, pretend to give details of its manufacture or the composition of the emulsion with which it is coated, though I fancy, from its behaviour and the rich colour it yields, I shall not be far wrong in saying that it contains a chloride as well as a bromide. It is of two kinds—"Velox" and "Special Velox"—with three grades of each. The first is best adapted for weak and flat negatives, as it tends to give strong contrasts. The latter gives softer effects with vigorous negatives such as are generally produced by professionals, therefore it is that which I recommend them to employ. It is more sensitive than the other, yet not sufficiently so to entail any greater precautions against light and its working.

Having had some experience of late with the paper, a few practical hints may be of service to those who have not yet worked with Velox. The developer is put up in tubes, and simply requires to be dissolved in four ounces of water, and is then ready for use. The tubes are sold at a very small price, and that, like the paper, is subject to a discount to the profession. The manufacturers make no secret of its composition, as that is given in the directions enclosed with the paper, and I have not found any difference between the sold in the tubes and that which I have made myself; and, as many



professionals will prefer to prepare their own developer, I here quote the formula. It stands thus:—

Water .....	10 ounces.
Metol .....	7 grains.
Sodium sulphite, crystals pure .....	$\frac{1}{2}$ ounce.
Hydroquinone .....	30 grains.
Sodium carbonate .....	200 "
(or 400 grains of the crystallised salt.)	
Ten per cent. solution of bromide of potassium (about) .....	10 drops.

The hydroquinone is best dissolved first, and the other materials added afterwards, and no more bromide should be used than will keep the whites clear. An excess, I find, is liable to give a less pleasing colour. On this developer I have not been able to improve when fine rich blacks are desired. If a large quantity of this developer be made up at a time, it should be put into small bottles, filled to the neck, and then closely corked. Under these conditions it will keep for a long time in good working condition. A second formula for a developer is also given, which is as follows:—

Water .....	4 ounces.
Sodium sulphite, pure crystals .....	200 grains.
Amidol (about) .....	20 "
Ten per cent. solution of bromide of potassium (about) .....	5 drops.

I have worked with both, but much prefer the first of the two though both in my hands have given good results.

The manufacturers of the paper lay great stress upon the sulphite of soda used, and I can emphasise the necessity for that from direct experiment. The sulphite should not only be pure when first made, but it should be preserved in that condition. If a small quantity of sulphite of soda, if originally perfect, be kept for a long time in a large bottle or exposed to the air, it becomes partially converted into sulphate. This, beyond loss of preservative action, does no material harm when used for dry plates; but with Velox paper the case is different, as here it is positively harmful, and likely to bring about trouble in the shape of streaks and other markings. It is for that reason that I would advise those who use the paper for the first time to have the tubes of developer, as they will thus ensure having the proper thing, and thereby try the paper under right conditions. The sulphite I have obtained from the Messrs. Griffin is perfect, so is that made by Boake's; but both require to be kept in that condition by preserving it air-tight. When a quantity is bought, I should advise its being ordered put up in four or eight-ounce bottles, according to consumption, so that the crystals are not unnecessarily exposed to the air when each batch of developer is made up. Other developers may be used with the paper, but of that I will say something later on.

With regard to the printing, a second or two to subdued daylight will suffice; but daylight is a very variable quantity, and when a second or two, either way, makes a material difference in the result, I recommend artificial light in preference. If we use a constant light, say gaslight, we can ensure uniform results, and much depends upon correct exposure here, as it does, indeed, with every other process of photography. With an average studio negative an exposure of about a minute, or a minute and a half, at twelve inches from a No. 5 bat's-wing burner, of the cheap regulator form, will be about right. Once the correct exposure is arrived at for a given negative, that for denser or thinner ones is easily judged. All is then plain sailing. Of course, three or four frames may be exposing round the light at the same time. When, however, Velox is worked commercially, I would suggest that the frames be laid flat on a table, above which is a gas burner of the regenerative type, such as the Wenham or the Siemens. We shall then have the frames always at a fixed distance from a practically constant source of light. By this means we shall work under constant conditions of light, and no errors need be made in the exposure. In place of the regenerative burner, a cluster of three incandescent gas burners, with an opal glass reflector above, may be employed. By this system of working, the exposure will, of course, be longer, five or six minutes; but a dozen or more frames,

according to size, may be exposing at a time, so no time will actually be lost. The prints need not be developed at once, as they do not hurt by keeping.

The next point is the development of the picture. The developer may be applied with a camel's-hair brush or with a pledget of cotton-wool, but in commercial work I recommend developing in a dish, using the solution more dilute than given in the formula—say the tube of developing salts dissolved in eight ounces of water instead of four, or the home-made developer diluted with an equal bulk of water before use. With the diluted developer a drop or two more of the bromide solution may be required. When taken from the printing frame, the print should be immersed for a few seconds in water and then transferred to the developer. The image then rapidly appears, and in a minute or two is fully developed. It may appear unevenly at first, but that is of no moment, as the laggard portions quickly overtake the others, and no trace of unevenness is seen afterwards, unless, indeed, the print is over-exposed and the development is stopped too soon. With right exposure the development stops as in the case of platinotype; if it is under-exposed, it is no use forcing the development, I find, with the idea of bringing out more detail. The developing action seems to stop suddenly when it has completed the action set up by the light; and that is one of the great advantages of the paper, as then uniform tints are secured. Sufficient and correct exposure is necessary to begin with, and that is easily secured by using artificial light; by that means any number of prints of equal depth and colour can always be ensured; and that is one of the most valuable properties of Velox. Several prints can be developed in the same solution, provided they be done immediately one after the other; for, if the solution be allowed to stand more than a very few minutes exposed to the air, marking on the prints will result. As the developer is so very inexpensive, I prefer to use fresh for each print.

As soon as the print is developed (which it will be in a minute or so), it is just rinsed in water, or under the tap, and at once put into the fixing bath. That recommended by the makers of the paper is the acid fixing bath of the formula issued with the paper. It is this:—

Hypsulphite of soda .....	16 ounces.
Water .....	64 "

When dissolved, add this solution:—

Water .....	5 ounces.
Sodium sulphite .....	$\frac{1}{2}$ ounce.
Glacial acetic acid .....	1 ounce.
Powdered alum .....	$\frac{1}{2}$ ounce.

Messrs. Griffin also supply the ingredients for this bath put up ready for dissolving. The fixing takes from ten minutes to a quarter of an hour, and it is unnecessary for me to tell professional photographers that, with Velox, as with all other papers, the prints must be kept moving all the while they are in the solution. The washing, in running water, should be about an hour.

With the formulæ and directions for use, issued with the paper, are given causes of non-success; but, if the directions are carefully followed and pure material used, they will be found unnecessary. Still it is well they are given, as then one may see where he has gone wrong.

I had intended to have given my experience in the productions of various reds, sepias, browns, &c., but I find my pen has been running too freely; therefore I propose, with the Editors' permission, to do so in a future article.

E. W. FOXLEE.

#### DEVELOPMENT AFTER FIXATION.

In the current number of the *Photographisches Centralblatt*, Dr. Haschek, writing on this subject, says:—

Kogelmann, of Graz, pointed out some time ago that the image could be developed physically after complete fixation. In September last, Dr. Neuhaus detailed his experiments, and many amateurs have made experiments, and, like myself, with no results, or the negatives were so thin that they were useless for printing. Many experiments were made by me to try and make the development as certain as in the ordinary



way, and a considerable improvement on Neuhaus's original formula was discovered; his developer was—

Distilled water .....	100 c. c.
Ammonium sulphocyanide .....	24 grammes.
Silver nitrate .....	4 "
Sodium sulphite .....	24 "
Sodium hyposulphite .....	5 "
Potassium bromide (ten per cent. solution) .....	8 drops.

For use, Dr. Neuhaus mixed 6 c. c. of this solution with 54 c. c. of water and 2 c. c. of rodinal. With this developer I was never able to obtain a trace of an image.

In place of this I recommend the replacement of the rodinal by 30-40 c. c. of a metol-sulphite solution, such as is used for ordinary work, and is made as follows:—

Metol .....	15 grammes.
Sodium sulphite .....	150 "
Water .....	1000 c. c.

When the plates are placed in the mixture, there will appear, after one or two hours, according to the exposure (and the plate should be strongly over-exposed and well washed from excess of hypo), a positive with all details when looked at, though it is scarcely visible when looked through. After about two hours the image has become sufficiently strong to show distinctly, when looked through, and can be treated further. When looked through, the image appears white, and, when looked at, as a vigorous positive. It should now be well washed and placed in a mercury intensifier, when the image will be first black and white, and at this stage it must be well washed and placed in a ten per cent. solution of sodium sulphite, when it will be intensified and become a beautiful blue-black colour. The plate is then washed and dried.

The above-named developer may also be used for plates in the ordinary way, and an image will be developed in about an hour.

#### THE GLOUCESTER CONVENTION.

THIS year's meeting of the Photographic Convention takes place at Gloucester, in the week July 10th to the 15th. The following preliminary announcement has been issued:—

By the courtesy of the corporation of Gloucester, the use of the spacious Guildhall has been granted for the Convention meetings. The Mayor has consented to open the proceedings, and it is anticipated that at the official reception the executive will be supported by most of the influential residents of the city.

A most attractive programme of excursions has been arranged, including Berkeley Castle, by the special invitation of the Right Hon. Lord Fitzhardinge; Elmore Court, the seat of Sir William Guise, Bart.; Frithern Court, the seat of Sir Lionel Darell, Bart.; the old English village of Frampton, Chepstow Castle, Tintern Abbey, Symonds Yat, Ashleworth, Deerhurst, Tewkesbury Abbey, Highnam, Matson, Hempstead, Cheltenham, Ledbury, Forest of Dean, &c.

Permission has been obtained to photograph the principal buildings in Gloucester, including the magnificent cathedral, the dean kindly allowing members of Convention to photograph the interior at any time during the meeting, except during the hours of Divine service.

The usual Trade Exhibition will be held, and, judging by the applications for space already received, it may confidently be expected that the exhibits of apparatus, pictures, &c., will be unusually numerous.

Special tariffs have been obtained at most of the principal hotels, and at the "Bell" (headquarters) a large room will be reserved for the sole use of members of Convention, whether living at the hotel or not. The Annual Dinner and Smoking Concert, at which ladies are welcome, will take place in the assembly-room of this hotel.

Gloucester is only 114 miles from London (Paddington), and is easily accessible from any station on the Great Western or Midland Railways, and the several lines in connexion therewith.

In connexion with the Convention Mr. Thomas Bedding, by the consent of the Council, has compiled a short history of that institution. It is here given in the belief that it will not only interest members and others, but be instrumental in attracting renewed support to the Convention, which, it will be observed from the appended details of its career, has filled a very useful part in photography during the thirteen years of its existence:

The Photographic Convention of the United Kingdom was founded in the summer of 1886. Its object was to afford facilities to photographers, professional and amateur, for an annual gathering at some suitable town, previously agreed upon, for the purpose of hearing and discussing papers of photographic interest; of holding exhibitions; excursions; a dinner; and other social gatherings. Conventions carried out on this model have for many years been popular amongst the photographers of the United States.

The founders of the Convention, the late Mr. J. Traill Taylor and

Mr. J. J. Bigginshaw, became its first Chairman and Hon. Secretary respectively.

#### DERBY MEETING, 1886.

The first meeting of the Convention was held at Derby in August 1886. The Mayor officially welcomed the members. Haddon Hall, Chatsworth, Dovedale, and Matlock were among the places visited on the excursions. The Convention lasted three days, the attendance numbering forty-six. An exhibition of apparatus was held. The following is a list of the principal papers read: "Success," H. P. Robinson; "Focussing Sailing Ships and other Moving Objects," J. Traill Taylor; "Instantaneous Photography," William Cobb; "Emulsion-making," W. K. Burton; "Daylight Enlarging," Andrew Pringle; "Gelatin Emulsion," A. L. Henderson. An Executive Committee was appointed by the members present.

#### GLASGOW MEETING, 1887.

The Convention was officially welcomed to Glasgow by Bailie Crawford on behalf of the Lord Provost and the municipality. The pictorial display at the Fine Arts' Institute, where the meetings were held, was pronounced "more attractive than that of the Pall Mall Exhibition;" the exhibition of apparatus was also large and interesting. During the week excursions were made to the Falls of Clyde, the Trossachs and Loch Katrine, Loch Lomond and Loch Long, Largs, &c. The dinner was attended by fifty members; the total attendance was about 200. A group of the members was taken at Tarbert.

Among the many papers read the following may be noted: "Finders and Focussers," Lyonel Clark, C.E.; "Elementary Photo-micrography," Andrew Pringle; "Home Portraiture," T. N. Armstrong; "Orthochromatic Photography," C. H. Bothamley; "Film Photography," S. G. B. Wollaston; "The Silver Photo-salts," W. Lang; and "Pretended Photography in Natural Colours." It is interesting to note that Messrs. Pringle and Bothamley at this meeting of the Convention first dealt with the subject upon which they have since become accepted authorities.

#### BIRMINGHAM MEETING, 1888.

The Convention was received by the Mayor at the Masonic Hall, New-street. Addresses at the opening meeting were given by Mr. W. Jerome Harrison (Chairman of the evening), Mr. Traill Taylor (Chairman of the Council), and Dr. Hill Norris. The excursions during the week were to Arley and Bardley-on-Severn, Stratford, Oxford, Kenilworth, Coventry, Warwick, Worcester, Malvern, and Dudley.

The dinner and exhibition were very successful. As evidence of the scientific spirit that animates the Convention, it is interesting to note that at the Birmingham meeting it was resolved, "That it was desirable to have a uniform standard of screws in connexion with camera fittings," and a Committee of five was appointed to consider the adoption of the system of standard lens fittings recommended by the Photographic Society, or to suggest alterations of the system, and to take or indicate such steps as might be necessary for its effective establishment.

Unusual interest attached to the papers read: "Orthochromatic Photography" being treated by Mr. Bothamley and Mr. B. J. Edwards; "Flashlight Work," "Printing-out Platinotype," and "Photo-lithography" being also discussed. The eminent astronomer, the late Rev. S. J. Perry, F.R.S., addressed the members on the applications of photography to astronomy.

#### LONDON MEETING, 1889.

A President of the Convention first appears at its head in the person of Mr. Andrew Pringle, F.R.M.S., who was chosen for the position at the Birmingham meeting. The meetings were held at St. James's Hall, and the custom of delivering a Presidential address was instituted.

During the week there were excursions to the following places: Windsor, Kew, Hampton, and Gravesend. A dinner was held at the Café Royal, and a group of the members was taken at Burlington House.

Mr. Bothamley again addressed the members on the subject of Orthochromatism, and among the other papers were: "The False Rendering of Photographic Images by the Misapplication of Lenses," T. B. Dallmeyer; and "Photo-Mechanical Printing," Thomas Bolas. A report was presented by the Standards Committee, appointed the previous year to consider and report upon the best means of securing uniformity in diaphragms and flanges of lenses and lens mounts. Several recommendations were made by the Committee.

#### CHESTER MEETING, 1890.

The President was Mr. C. H. Bothamley, F.I.C., F.O.S., and the Mayor of Chester welcomed the Convention, in whose honour his Worship held a *Conversazione* at the Town Hall. The Exhibition of apparatus attracted many novelties. During the week there were excursions to Moreton Old Hall, Llangollen, Conway, Bettws-y-Coed, Hawarden Castle, &c.

"Lens Standards," by Mr. A. Haddon; "Photo-micrography," by Mr. Pringle; "Animal Photography," by Mr. Gambier Bolton, were among the subjects dealt with at the evening meetings, at one of which Mr. Friese-Greene read a paper, in the course of which he described "a camera which had been constructed for taking photographs by merely turning a handle, which made a series of negatives on a band of sensitive material at the rate of 600 a minute." This is of historical interest in view of the great development in animated photography that has since



taken place, and singles out the Convention as the scene of the first mention of one of the most notable of modern photographic achievements.

#### BATH MEETING, 1891.

The late William Bedford occupied the Presidential chair, and the Mayor received the members in the Guildhall. Salisbury, Clifton, Bristol, Glastonbury, and Wells were visited during the week. At this meeting Mr. F. P. Cembrano, junior, who subsequently became President of the Convention, was appointed Hon. Secretary, in place of Mr. J. J. Briginshaw, whose business ties obliged him to resign.

At the meetings recent developments in printing processes were described in detail by Mr. Bothamley; the cult of indistinctness was criticised by Mr. W. E. Debenham, and Mr. L. Warnerke read a paper on a series of proposed International Standards.

#### EDINBURGH MEETING, 1892.

Presided over by Mr. George Davison, the Edinburgh meeting of the Convention was officially welcomed by the Lord Provost of the City. The papers read by Mr. H. P. Robinson and Mr. Arthur Burchett treated of the pictorial side of photography; Mrs. C. Weed Ward, Mr. Howard Farmer, Dr. C. L. Mitchell, and Mr. F. M. Sutcliffe also read papers. Among the interesting places visited on the excursions were Melrose and Dryburgh, Newhaven, St. Andrew's, Cramond Bridge, &c.

#### PLYMOUTH MEETING, 1893.

Again was the Convention the recipient of a compliment at the hands of the municipality, the Mayor of Plymouth welcoming the members at a reception in the Athenæum. Mr. George Mason, of Glasgow, was the President of the year. Excursions were made to Tavistock, to Mount Edgecombe Park (by kind permission of the Earl of Mount Edgecombe), Totnes, Dartmouth, &c.

The Mayor of Devonport also received the Convention. The papers submitted were of remarkable interest. The properties of the Zeiss Anastigmatic Lenses were exhaustively described by Dr. Rudolph of Jena, and Messrs. Hurter & Driffield gave an exposition of their system of measuring the speed of plates. The names of W. K. Burton, E. J. Wall, and the Rev. F. C. Lambert appear among the readers of papers.

#### DUBLIN MEETING, 1894.

The eminent optician, Sir Howard Grubb, F.R.S., presided over the meeting, and the Lord Mayor welcomed the members in the Library of the Royal Dublin Society, a *Conversazione* being subsequently held in the Science and Art Museum building. During the week, very successful excursions were made to Monasterboice, Drogheda, Powerscourt, &c., and the Lord Mayor gave a garden party to the members at his house at Killiney. At this meeting the Convention for the first time was declared to be in a satisfactory financial position, having a credit balance of 50l.

Among the readers of papers was Dr. Joly, who first publicly outlined his colour process at the meeting of the Convention. The President's paper was a valuable one on optical matters, and other subjects dealt with were the influences of temperature upon the sensitiveness of dry plates, a Photographic Sextant, Astronomical Photography, and the uses of Photography in Medicine.

This was a most successful gathering, and the membership reached a total of 270.

Mr. R. P. Drage became Hon. Secretary of the Convention at the close of this meeting.

#### SHREWSBURY MEETING, 1895.

The Tenth Meeting of the Convention was presided over by Mr. A. Haddon, and the Mayor received the members in the Guildhall. During the week the Convention was entertained by Mr. H. D. Greene, Q.C., M.P., Member for the Borough, and the principal excursions were to Bridgworth, Stokesay, Church Stretton, Ludlow, Buildwas, and Wenlock Abbeys.

Mr. Cembrano, the late Hon. Secretary, was presented with a hand camera in recognition of his services. The hearty hospitality of its Shropshire hosts and the beauty of the scenery on the excursions were highly appreciated by the members of the Convention. The group contained 130 portraits of members, many of them ladies. Colour photography formed the subject of papers by Mr. E. J. Wall and Mr. Child Bayley. Mr. Alfred Maskell dealt with pictorial photography, the old and the new.

#### LEEDS MEETING, 1896.

Mr. H. P. Robinson, the doyen of English photographers, occupied the Presidential chair, and he kindly organized a special Exhibition of Pictorial Photography, which was held in the Library of the Museum. An official reception was tendered to the Convention in the City Art Gallery. Bolton Abbey, Fountains Abbey, and York were the principal scenes of the excursions, which were largely attended and were highly successful. The principal paper read was one on "The Fixing and Washing of Prints," by Mr. Haddon. Radiography and Orthochromatism were also treated of.

#### GREAT YARMOUTH MEETING.

The President was Mr. Cembrano, and the Mayor officially received the Convention. Excursions by water were made to Lowestoft, Norwich, Salhouse Broad and Oulton Broad. The subjects of the papers were:—

"Methods of Control and their influence on the Ultimate Development of Artistic Photography," by Mr. A. Horsley Hinton; "The Points of a Lens," by Mr. Dallmeyer; "Half-tone," by Mr. Gamble; "Photography in Natural Colours," by Mr. Wall; and "The Strength of Hypo Solution and Time of Immersion for Fixing Albumenised Paper," by Messrs. Haddon and Grundy. The latter paper was the outcome of a grant in aid of research voted by the Council.

At this meeting the Dansac-Chassagne process of so-called photography in natural colours, by "selective colour absorption," was publicly demonstrated to members, who had an opportunity of observing that it failed to sustain the claims made on its behalf.

In addition to the usual group, a cinematographic picture of members was taken by Mr. E. P. Prestwich, and shown at one of the evening meetings.

Mr. Drage having resigned the Hon. Secretaryship of the Convention, Mr. F. A. Bridge was elected to fill the vacancy.

#### GLASGOW MEETING, 1898.

The Convention met for the second time at Glasgow, and was presided over by Mr. John Stuart. The chief excursions were to Ayr, the Forth Bridge and Edinburgh by train, down the Clyde and to Loch Lomond by water. An afternoon reception was given to members in the Municipal Buildings. The Presidential address was a comprehensive one, and, besides photography in natural colours, development, the speed of plates, and the gum-bichromate process were discussed at the evening meetings. The pictorial exhibition was large and interesting, the trade exhibits and local professional photography being noticeably good.

The membership reached a record total of 328.

#### HOME PORTRAITURE.

At the last meeting of the Oxford Camera Club Miss Acland gave her promised paper on "Home Portraiture." The beautiful portraits which Miss Acland had shown at the Club Exhibitions made the members anxious to learn her methods, and there was a large attendance. The President (Sir W. J. Herschel, Bart.) was in the chair, and Miss Acland's father (Sir Henry Acland, Bart.) was also present. The paper was a very comprehensive and able one, and was listened to with great attention, the beautiful examples of portraiture thrown on the screen by Miss Acland's brothers, who manipulated the lantern, elicited much applause. Miss Acland said the amateur, if he possessed technical skill, ought to find it easier to produce good portraits than the professional, as his sitters would be less constrained.

One of the first difficulties was the getting rid of all ideas of colour, and regarding the subject simply as a study in black and white. The proper distribution of light and shade was very important, and, by the kindness of the Curators of the University Galleries, Miss Acland was able to show three of Sir Joshua Reynolds's studies in black and white. These were carefully examined and criticised; they gave a vivid example of the importance of this part of the subject. The second difficulty was that of properly lighting the subject, especially in the absence of a properly equipped studio. Outdoors a shady place should be chosen, where the light is cut off on one side, and care must be taken that the eyes of the sitter do not face a strong light. It was a great advantage to use a screen, which can be easily made by stretching blue tarleton over a hoop fastened to a bamboo pole. It was mentioned that Mrs. Cameron used to place her sitters inside a barn with large open doors.

For indoor portraiture a long room should be chosen if possible, with two windows on the north side. The sitter should be placed opposite one window, about six feet from it, and, should it be a high one, the blind should be drawn a little to cut off the top light, or a piece of muslin at the top to diffuse the light would be better. Should the window reach to the ground, it should be covered to about the height of the sitter's shoulders. The second window, near where the camera stands, is useful to diffuse the light, and need not usually be interfered with. Should the shadow side appear too dark, a white blanket should be hung a little distance from the sitter; a blanket gives a softer reflection than a sheet or table-cloth. If a strong effect is required, concentrate all the light on the sitter by drawing the curtains of the second window. It was recommended that, before attempting portraits, experiments should be made on a bust in different positions, making careful notes of the effect of the light.

Miss Acland showed a remarkable example in four studies of a bust of Dante. It was seen that the variations of light and shade on the bust produced quite a marked alteration in the expression of the face. In one, Dante appeared with his usual lugubrious expression, while in another he appeared to be smiling; and one example was shown in which all expression had been eliminated by extensive retouching, so much in vogue. The question of backgrounds required much consideration. Rubens once said to a young painter that, if he properly understood backgrounds, he required no instruction from him, and it was admitted by all painters to be very important.

The amateur had not much choice; but a blanket made a good background, or a plain sheet on a roller could be purchased, it should be not less than eight feet high for standing figures. Slate was a useful colour, and Miss Acland showed how the colour of a slate background could be



varied by placing it in different lights almost so that in some cases it would appear quite white, and in others quite black, and by placing it at an angle it could be shaded off on one side. When the figure was beautiful it might stand out boldly, but, when this was not the case, it should be partially lost in the background. Ladies are more difficult to take than gentlemen, and particular care should be given to the posing; to make a graceful pose, the head should not be in a straight line with the body. It is often a help to tilt the camera down a little without using the swing back, so as to bring the different parts into one plane. The hands required special care; the wrists should be bent so as to produce a shade on it, to mark it, or it will not be seen. Few faces are sufficiently symmetrical to be taken full, and Mr. Debenham's rules, as to which side of the face should be taken, were quoted from *THE BRITISH JOURNAL OF PHOTOGRAPHY* for June 24 last. An expensive camera and lens were not a necessity, although, of course, when they could be had, so much the better; a good portrait was shown which had been taken with a guinea pocket Kodak.

In conclusion Miss Acland deprecated the idea that the photographer, however skilled, could ever compete with the artist in taking portraits: "Sun pictures can only be a means of elevating taste by rendering us more familiar with nature's infinite beauty, and by educating the eye by presenting her transient forms and effects imprinted by her own hand without fear or favour, causing true art to be better appreciated and more widely understood."

Many beautiful examples of portraiture taken by Miss Acland were thrown on the screen. These were, in most cases, friends and visitors at her own home, and their easy, unconstrained expression fully bore out what was said at the beginning of the paper as to the advantages over the professional in this respect. The portraits shown included Lord and Lady Salisbury, the late Mr. Gladstone, Mr. Ruskin, the Bishop of Oxford, Lord Kelvin, Sir Wm. Richmond, Prof. Max Müller, the late Dean Liddell, Miss Acland's father (by her uncle, the late Sir Thomas Dyke Acland), Mr. Brunel, Dr. Billings (Deputy Surgeon-General of the American Army), and the President of the Club, Sir W. Herschel.

At the close of the lecture a hearty vote of thanks was given to Miss Acland for her valuable paper, and some time was spent in examining the examples of portraiture by Miss Acland. Valuable Daguerrestypes, &c., and also a portrait in natural colours taken by Mr. Ives for the President, and which was shown in the photo-chromoscope. This was said to be the first portrait ever taken in natural colours.

#### AT THE CAMERA CLUB.

THE history of Renaissance architecture is a subject which lends itself to illustration by photography, and when it was known that such a competent lecturer as Mr. G. A. T. Middleton had promised to tackle the story, a large attendance of members of the Club was assured, for Mr. Middleton has again and again given evidence of his fitness to discourse upon matters architectural, which he does without notes and with a surprising fluency, considering the difficulty of the subject in hand; and his photographs, if not always technically perfect, are always taken with a view to illustrate some truth, or to show some little detail which he has unearthed, it may be, in some old-time Continental town, a detail which many would pass unnoticed.

Mr. Middleton's first examples were taken from the beautiful city of Florence, in whose palaces, churches, and public buildings generally, are to be found so many of the choice treasures which former artists and sculptors have left as evidences of their genius. Here we were shown a fine photograph of the well-known duomo of the cathedral, begun in 1447, and finished by Brunelleschi. To this man may be ascribed the Renaissance so far as Italy was concerned, for he went to Rome, saw the ancient buildings there, and, adapting their style to meet later requirements, went back to Florence and completed the cathedral there. He was a goldsmith by training, and, like many of that trade, became later on an architect; to this circumstance common to the time we owe much of that elaboration and fineness of ornamental design which we find upon so many early buildings, resulting in a richness which delights the photographer as much as any one.

Thus the Renaissance first arose in Florence by the genius of one man. Other buildings in the same beautiful city show plenty of evidence that the lesson was taken to heart by other architects, one of the most beautiful examples being a palace, which outside was stern and prison-like in appearance—for the exigencies of the time required that it should be a stronghold as well as a home, while inside all was of the greatest richness and delicacy. In Rome the Farnese Palace was selected by the lecturer as an example of Renaissance work; but the movement met with no support there until the sixteenth century. The interior of St. Peter's gave an opportunity of comparing that magnificent building with our St. Paul's in London, which, as is well known, was designed on the same model. It was the work of Michael Angelo, a painter, and for this reason he had given, in designing it, every opportunity for the introduction of paintings and mosaics upon its walls.

The third great city which came under consideration was Venice, and of which beautiful views of the Rialto, the Bridge of Sighs, &c., were thrown. Valuable lessons were drawn by the lecturer from the details of

each building, an advance in taste being indicated here and a retrograde step there. Decadence was shown in the building at Genoa by the introduction of pillars which had nothing to support, and buttresses where their aid was not required.

Many fine examples of French architectural work were projected on the screen, to show that Gothic had taken a much firmer hold in France than it had in Italy, and had resulted in masterly work. In these pictures it became apparent from what source our modern English architects have drawn much of their inspiration, and in some cases had improved upon the original works.

It was natural that Renaissance should quickly get from France to Belgium, and many fine examples of Belgian work were shown. Some of them were from casts; and the lecturer took the opportunity of reminding his readers that one of the finest collections of architectural casts in the world was at the Crystal Palace, Sydenham. Unfortunately, he added, it was difficult to get permission to sketch or photograph them.

There was a curious flaw in one of the lantern pictures shown here. It was a picture of a pulpit, supported by life-sized sculptured figures, one of which was holding out his upturned hand. Exactly on the fingers, as if balanced there, was a comet in the cover glass, looking just as if the saint had taken off his halo as an ordinary mortal would his hat.

In Germany, and notably at Nuremberg, we were shown how Gothic feeling was combined with Renaissance work with the happiest results; and it was with interest that we learnt that the authorities in this quaint old town were careful, in rebuilding where needed, to carry out all new work according to old traditions. Another old German town, that of Rothenburg, was happy in the circumstance that only one new building had been erected within its walls for a century past. Mr. Middleton strongly advised his brother photographers to visit the place.

With regard to modern work, the Germans are scientists rather than architects, and show a tendency to stiff and formal reproductions of classic models. They miss the spirit of Renaissance and give us only its dry bones. Thus finished a profitable evening at the Camera Club, under the chairmanship of Mr. Bros.

On Monday, the 6th inst., there was no lecture, but, nevertheless, the members spent an enjoyable and strictly photographic evening, for various manufacturers and dealers had been invited to show any novelties they might be introducing. It was a happy thought on the part of the Hon. Secretary to arrange such an evening as this, which turned out to be quite a little exhibition in itself. Some of the exhibitors were wise enough to send representatives to demonstrate the virtues of their apparatus, while others were content to forward written accounts of the goods which they sent, to which attention was called by the Hon. Secretary.

Messrs. W. Butcher & Son, of Blackheath, and Mr. Tylar, of Birmingham, showed many little novelties in the shape of small things of great use to photographers. The photographic outfits of the former firm are most compact and wonderfully cheap. Mr. Tylar's isochromatic screen discs to fit on any lens attracted a good deal of attention, as did also his Cascade Washer—a series of metal trays one above the other, so arranged that the water from a tap entering at the top will effectually leave the plates lying in all the others.

The Platinotype Company exhibited some new wood and metal cases for the preservation of their paper. At the lower end of the cylindrical case is a receptacle for calcium chloride, and at the top a cleverly constructed air-tight lid. This lid fits into a recess, and pressure upon a central knob causes an indiarubber band to press outwards, and make an air-tight and damp-tight joint.

The representative of Messrs. Gaumont & Co. exhibited a well-made form of cinematograph apparatus, which he claimed to be almost silent in action, a claim which no representative was present to substantiate. It was unfortunate that no film was passed through the machine, for the statement was made that, should the celluloid by any accident be ignited, the fire could not spread beyond the picture at the time in front of the lenses. This is a very important advantage; but, in the absence of a demonstrator, it was impossible to see how this immunity from danger was secured. This firm also showed a neat form of opera-glass camera—Photo-Jumelle—and mentioned that they were agents for the Artigue carbon paper.

The Eastman Company's representative exhibited the newest forms of daylight-changing Kodaks, and showed some fine specimens of pictures taken on their recently introduced Dekko paper. This paper is apparently coated with a slow chloride emulsion, for it can be handled with impunity by ordinary lamp-light. The specimens shown were full of delicate gradation and fine detail. This paper will not only be valued by amateurs, but by professionals also, for it offers a ready means of securing rapidly a proof print without the necessity of toning.

Messrs. Ross sent a representative to exhibit many interesting pieces of apparatus, each of which showed ingenious design and very beautiful finish. The "Combination" lantern, which can be used for enlarging, for ordinary projection, and for scientific demonstration, is a very fine instrument, and, when employed with the "Radiant" jet, a magnificent light is obtained. The smaller lantern, known as the "New Model," is also worthy the attention of lanternists, for it exhibits more than one entirely new feature. It has, for example, no body, in the ordinary sense of the term, but in its place a metal box about three inches in depth, the



sole use of which is to contain the lime cylinder. The apparatus is, in other respects, wonderfully compact and very cheap. The projection arc lamp, which possesses many good points, was also shown by Messrs. Ro-s's representative, as well as other novelties.

This exhibition of photographic apparatus excited a good deal of interest among members of the Club, and many questions were asked and replied to. The Hon. Secretary expressed his pleasure at seeing so many exhibits, and said that the Club were much obliged to the various firms who had brought these novelties to their notice, and to the gentlemen who had acted as demonstrators.

#### YORKSHIRE PHOTOGRAPHIC UNION.

A MEETING of delegates, in connexion with this movement, was held at Bradford Grammar School, on Thursday, March 2.

Mr. Godfrey Bingley was voted to the chair, and there were present Messrs. Percy Lund and Alex. Keighley (Bradford Photographic Society), Fred T. Coupland (Yeadon and District), Harold M. Briggs (Wakefield Photographic Society), James Laylor and J. Crossdale Coultas (Leeds Photographic Society), Thomas Heaps and Mr. H. Hainsworth (Keighley and District), W. H. Atkinson (Batley), F. W. Rhodes (Heekmondwike), J. F. Ashley (Rodley), J. W. Holland and Lionel Dickinson (Halifax), J. H. Georgeson and A. H. Ormerod (Brighouse).

There was nothing of very special interest that transpired, a good part of the evening being occupied by a further discussion in regard to the provisions relating to the scheme dealing with lectures and lecturers.

It was announced by the Hon. Secretary (*pro tem.*), Mr. Ezra Clough, that the following societies had already joined the Union: Batley Photographic Society, Beverley, Bradford, Brighouse, Halifax Camera Club, Heekmondwike Photographic Society, Hull, Keighley, Leeds, Rodley, Sheffield, Wakefield, Scarborough, Sheffield Optical Society, and Yeadon Photographic Society.

The Chairman said he thought they ought to consider the return fairly satisfactory in the present state of the proceedings.

The Hon. Secretary stated that various societies had paid their subscriptions, but as yet it had been impossible to forward official receipt forms.

The first business was the further consideration of the constitution of the Union, as already published.

Mr. Percy Lund pointed out the inadvisability of making that night what he described as "cast-iron" rules. They should devise something for their general guidance, which could be varied at any time as necessity arose and experience directed.

It was decided that the membership be: 50 or less, 10s. per annum; 100 or less, 15s.; and 20s. for all above that number.

Mr. Rhodes put forward a motion to the effect that the subscription be 30s. for associations above 100; but this was defeated.

A lengthy discussion took place with regard to Associates and their standing in the Union, and ultimately it was resolved on the motion of Mr. Lund, seconded by Mr. Coupland—"That the Committee may also add to their number five Associates who shall not already be representatives or members of any society attached to the Union."

Mr. Georgeson thought it was a mistake to have a Committee consisting of twenty-five. A smaller Committee would be more workable.

Mr. Ashby was of opinion that the suggested Committee was not too large.

Mr. Clough favoured the appointment of as large a Committee as possible.

The question of the interchange of lecturers gave rise to a lengthy debate.

Mr. Briggs doubted if the suggested course of action would work. (Each society in the Union shall be allowed two voluntary lectures each season, and in addition an extra lecture for each approved lecturer, &c.)

Mr. Clough asked, if there were societies in the Union which had no lecturers at all, how were they going to be provided for?

Mr. Briggs: It appears they would get two.

Mr. Clough: Where are they to come from?

Mr. Briggs: I think it is a mathematical absurdity.

Mr. Ormerod thought it was a mistake. If the small societies could get lecturers, they ought to have them, apart from supplying lecturers themselves at all.

Mr. Lund expressed the opinion that the matter should be left to a sub-Committee of the Union, to make out a list of suitable lectures.

The Chairman said it seemed to him it would be the best place for the Union to get a list of likely lecturers from the various societies, and submit the names to the societies for consideration. The great difficulty would be to give the societies a list of gentlemen who would be willing to give lectures. Were the lecturers to deal with the societies themselves? This was the one question upon which a certain society had disagreed with them. One gentleman had said to him, "Is the Committee of the Union going to say where lecturers are to go to? If they are, I shall object. I think lecturers ought to choose their own locality." It ought to be left optional. The names of willing lecturers ought to be given, and the various associations apply to them direct.

Mr. Dickinson thought the best plan would be for the Union to draw up a list of the available lecturers and submit the list to the secretaries of

the various associations, who could afterwards meet and mutually arrange their programmes.

Mr. Briggs said the idea of an interchange of lecturers was an admirable one, especially as regarded the smaller clubs. He did not think there would be any difficulty in getting any lecturer to go to any part of the country.

The Chairman: Possibly it might be practicable to group the districts.

Mr. Coupland asked what constituted an "approved" lecturer. If a man was a good lecturer, he would have an approved reputation from somewhere. It seemed to him it was not necessary a man should have a good reputation, but, at the same time, he mustn't have a bad one. They ought to classify the lecturers as "high flown," "first class," and "elementary."

Mr. Lund agreed that it was absolutely necessary the Union should draw out some plan as to the lecturers at their disposal—their qualification, and the districts they were prepared to cover.

Mr. Heaps hoped it was not intended to alter the arrangements with regard to lecturers, as certain societies had joined on the strength of existing arrangements.

Mr. Clough pointed out that they could go no further until they knew what the lecturing staff was likely to consist of. They must not forget that it was very materially with regard to the question of lecturers that the Union would stand or fall.

Mr. Briggs intimated that, unless the lecturer question was satisfactorily settled, the Wakefield Association would have to reconsider their position.

Mr. Heaps strongly supported Mr. Briggs's view of the matter.

The Chairman pointed out the danger there was in promising something they might not in the long run be able to fulfil.

Mr. Hainsworth suggested that the discussion, extending over nearly an hour, had been of no use.

Ultimately it was decided to postpone the matter for further consideration.

On the motion of Mr. Briggs, it was decided "that the constitution stand for twelve months, subject to any alteration made at any general meeting."

It was resolved that the whole of the existing delegates form the Committee of the Union, and that circulars be sent to the members, asking them to give their votes for the various officers required in the Union.

It was decided to hold the next meeting on April 13.

#### MAGNESIUM CARTRIDGES.

THE little magnesium cartridges at present in the market have been found so useful in practice that the following description of the method of their preparation, due to the inventor, Mr. York Schwartz, of Hanover, will, doubtless, be interesting: When finely powdered metallic magnesium is mixed with a chlorate, or a picrate, or a permanganate, or similar substance easily delivering oxygen, compounds are obtained which, on ignition, burn rapidly, evolving a great volume of light of high optical and chemical intensity. Such mixtures are largely used for the purpose of photographing at night, or in places where daylight has no access. Serious objections, however, may be raised against their use, for

1. They are more or less explosive, and sensitive to friction or concussion.
2. In combustion they give off a great quantity of smoke.
3. They easily deteriorate under the influence of moisture.

I have now found that mixtures producing the same, if not better, effects as regards the illuminating power, and being in all other respects far superior to the compounds described above, may be obtained by mixing:—

Finely powdered magnesium and

A. Finely powdered silicic acid (by preference the natural material known as "infusorial earth").

Or, B. Finely powdered boric acid.

Or, C. Finely powdered anhydrous sulphate of lime.

Or, D. Finely powdered sulphate of baryta.

Or, E. Finely powdered anhydrous sulphate of magnesia (by preference the calcinated mineral known as "Kieserit").

Or, F. Finely powdered sulphate of strontian.

In suitable proportion, by preference equal parts of magnesium and one of the substances named. Instead of only one of these substances, A, B, C, D, E, F, several of them may be used in composing the mixture, so as to arrive, for instance, at the following formula:—

Finely powdered metallic magnesium, 1 part.

Finely powdered silicic acid,  $\frac{1}{2}$  part.

Finely powdered boric acid,  $\frac{1}{2}$  part.

Finely powdered anhydrous sulphate of lime,  $\frac{1}{2}$  part.

Finely powdered sulphate of baryta,  $\frac{1}{2}$  part.

Finely powdered anhydrous sulphate of magnesia,  $\frac{1}{2}$  part.

Finely powdered sulphate of strontian,  $\frac{1}{2}$  part.

While all these mixtures have in common that they are not explosive, not sensitive to friction or concussion, deliver in combustion only very little smoke, do not easily deteriorate under the influence of moisture, burn very rapidly, instantaneously, emit in combustion a great quantity



of light of highest optical and chemical intensity, mixtures A and B offer yet a special feature. When compressed in a tube of suitable non-combustible material, one end of which is closed, the other being open but contracted, by preference so as to form a narrow slit, and then, when the contents of the tube are ignited at the open contracted end, a broad and long sheet of brightest light, with scarcely any smoke, is emitted. In this case the combustion is not instantaneous; the emission of light lasts for some time, and may be prolonged at will by adapting the size and proportions of the tube to the purpose for which the light is to be used.

#### NOTES FROM THE WEST OF SCOTLAND.

THE action against the Shettleston Camera Club, which has caused so much interest in photographic circles throughout the United Kingdom, has been advanced a stage in the Sheriff's Court of Glasgow, when, on the diet for the adjustment of pleas, the agent for the pursuer made an application for the grant of further time to enable the pursuer to collect additional evidence. This the Sheriff granted, but we understand the case comes into Court again very shortly, and, if it goes to proof, it will be tried before a jury.

It is gratifying to be enabled to announce that at last there is something like a revival of the old interest taken in the proceedings of the Glasgow Photographic Association. The new Hon. Secretary, Mr. Macdonald, is sparing no pains to bring this Society into what may be termed a new lease of life, and Mr. Lindsay Miller's recent lecturette, with the old Chairman and President, Mr. W. Lang, F.C.S., drew a crowded audience. This contrasts favourably with recent meetings, and promises well for the future.

Mr. William Verel of the Albion Albumenising Company, has just finished the construction of a very clever piece of apparatus in the shape of a changing box, intended for the exposure of plates of any size, from the modest quarter-plate up to the largest of, say, twelve by ten dimensions.

By an exceedingly simple movement a plate is separated from a batch, exposed and then caused to locate behind all the others in the magazine. The apparatus is of very small bulk, and the simple and certain action of changing the plate is quite surprising.

The Messrs. Lizars are also bringing out a clever new magazine camera that carries both films and plates, and it is gratifying to note that Mr. Matthew Ballantyne, who has gone to the Canaries to recruit his health, is making satisfactory progress, and expected home shortly quite convalescent.

#### THE SOUTH LONDON EXHIBITION.

THE Tenth Annual Exhibition of this Society is noticeable for the fact that the work contributed by the members is so good and varied that it may fairly be considered equal to the section that is derived from outside support. This progressive tendency on the part of the South London is shared by such veteran exhibition-holding societies as the Hackney and the Birmingham. In course of time we anticipate that the levelling-up movement that is visibly going on will become so general that open classes will no longer be necessary to ensure the numerical or artistic success of a society's exhibition, and that just as champion classes have ceased to exercise their former magnetism on many first-rate photographers, so those sections that are still open to outsiders will fail to possess that significance that once attached to them. Observation convinces us that many causes are at work in this direction, and not the least of them is the undoubted fact that pictorial photography has reached a stage which does not easily admit of any marked advance or improvement, and that the teachings and examples of the last ten or a dozen years have produced a numerous crop of workers fairly equal in ability to make pictures by the aid of photography. Both these causes, or rather effects, make themselves apparent in a cohesive society like the South London, and thus the necessity for relying upon an open section to form the main attraction of its Exhibition is gradually disappearing.

There is another and a paramount reason why all well-wishers of photography should rejoice at the very agreeable tendency we have just glanced at, and that is the support it unquestionably lends to the aspirations of those who desire to see the abolition of the medal system. It will, no doubt, be a very long time before medals at exhibitions are done away with; but one of the most potent forces at present operating to bring about that end is the gradual growth of the custom of societies relying entirely on their own members' work for exhibition and distinguishing the best photographs shown by a certificate, or not at all. The cumulative influence of the slow decline of open classes is working in the same direction, and we quite confidently look forward to the time when the dignity of exhibition photography will no longer permit itself to be affronted by the silly and unsatisfactory system of medal-bestowal, which like all abuses is dying such a hard and prolonged death.

But, to escape from the discussion of abstract questions, let us congratulate the South London Society on its present Exhibition. It suffers,

perhaps, both in the members' and the open sections by reason of the admission of a not inconsiderable number of mediocre photographs, the presence of which, in the members' classes, may, however, be excused on the ground that it is a good thing to let the beginner, in picture-making, see for himself how his work stands by comparison with the production of older workers. While fully maintaining its reputation for architectural work, the Society is happy in the possession of several members who can produce distinctly high-class portrait and figure studies, and of the new men who shine in both these branches we have every hope of hearing great things in the future.

Class A (Members' Portraiture, and Figure Study, including Animal).—Mr. A. Flint shows some delightful child portraits, expression, pose, and lighting being of the happiest. He well wins his award. Mr. E. Matthews betrays marked ability in a charming and delicate little portrait, *Dear Dollie*, and a very good portrait of a young lady, *Memories*, the reflective expression being well suggested. A nun subject (No. 20) is marred by the line separating the shadow of the hood from the brightly lit face, cutting the head, as it were, in two. We liked Mr. W. T. Tollett's animated *Flower Girls*, a street-view at Piccadilly-circus. The artist evidently has an eye for pictorial effect in a London street, and the ability to photograph it. It is full of life and natural movement.

Class B (Architecture).—This class is, of course, replete with first-rate architectural studies. The successful competitors show singularly delicate and well-graduated pictures. A word of praise should be passed to Mr. C. Churchill for his capital renderings of statuary.

Class C (Landscape, Seascape, and Scenery).—The work in this class is very mixed; it would have stood considerable weeding out. Mr. E. H. Lamb again secures notice with *Waning Day* and *Homeward Bound*. The exhibitor's name is new to us, but he evidently possesses great pictorial power. Out of such an unpromising theme as *Evening on Yarmouth Denes*, Mr. T. Moyser makes a very pleasing and sentient photograph; so, too, Mr. T. A. Price, with a view of an *Old Farm at Sunset*, secures a very happy result. *A Misty Feeling in the Air* (bronze) well suggests the effect pointed at in the title. Mr. and Mrs. Welford show beautiful landscape work, and the former, in *The Top of the Hill*, is represented by a vigorous and original photograph. We like the work of Mr. Welford and others at this Exhibition which shows traces of breaking away from the imitative tendency that has recently attacked many well-known exhibitors.

Class D (Hand-camera Work).—This is neither better nor worse than most hand-camera classes. The work of Mr. and Mrs. Welford is certainly the best shown, the former's pastoral scenes being hand-camera work of a very high order indeed. For the "usual thing" in snap-shots, with which the class abounds, it is late in the day to feel or express admiration.

Class E (Beginners since January 1) of course contains a few horrors; but Mr. E. B. Collins (photographs of panels at Windsor), and a well-meant illustration of *The Ploughman Homeward Plods his Weary Way*, and Mr. F. Wise, redeem the class from something below mediocrity.

In Class G (Members' Pictures previously Medalled), besides a graceful head study by Mr. Mathews, *Naomi*, there are some good land and seascapes by Messrs. Lamb, W. F. Slater, Welford, and in Class H (Open Pictures previously Medalled), Mr. W. F. Bannister has a fine study of *Sunlight and Shade*, the deep dark frame heightening the effect. Mr. H. E. Brightman's representation of *The Miser* is most dramatic and realistic. Not that we personally know anything of such unpleasant people as misers, but that Mr. Brightman conveys very successfully the traditional way in which the poor creatures gloat over their gold. The gentleman studying *An Interesting Paragraph*, has supplied Mr. W. Illingworth with the opportunity of achieving a highly effective bit of genre work. *Polly*, by Miss Weil, is a delightful bit of girl portraiture.

Class J (for Pictures not previously Medalled), contains about 100 of the 461 pictures hung. *Convalescent*, a lamp-light study of a reclining lady by Mr. Thornley Brooks, is excellent in naturalness of effect and arrangement. A series of capably executed portrait studies comes from Messrs. John Chaffin & Sons, and we congratulate the firm on the very great advances their work shows here. *Undine* (a fanciful study by G. B. Cowen) and Mr. Dowden's cleverly lit *Normandy Peasant* arrest attention, and Mr. Howard Esler's panel reproductions show flawless technique. *Worn Out* is the photograph of a pathetic-looking old man which secures Mr. Illingworth the silver medal. It is well deserved, for the photograph is very powerful in naturalness of effect. Mr. Pirie Macdonald's portrait studies are very striking; they would have been more appreciated if a printing process better calculated to suit such subjects had been chosen. A few gum prints are shown, but they are not satisfactory productions—they have a crude effect of stipple work. The sooner this unfortunate process is killed outright the better. On the other hand, Mr. W. E. Smith shows a gum print in colours of *Pear and Apple Blossoms* which is rather effective.

The wall space at the South London Exhibition is very great, and the public likes a lot for its money. It gets it here. Personally, however, we should have unhesitatingly rejected half the photographs that are hung. Nevertheless, there is some remarkably good work shown, and the Society is to be complimented on the support it receives both from within and without.



The Judges were Messrs. Hinton, Hodges, and Pringle, and their awards were:—

MEMBERS' CLASS.

CLASS A.—Silver medal, No. 5, Mr. A. Flint; bronze medal, No. 19, Mr. E. Mathews.

CLASS B.—Silver medal, No. 79, Mr. E. H. Lamb; bronze medal, No. 89, Mr. S. W. Whiteman.

CLASS C.—Bronze medal, No. 147, Mr. C. W. Walker.

CLASS D.—Bronze medal, No. 247, Mr. W. T. Tollett; bronze medal, No. 252, Mrs. J. A. Welford.

CLASS E.—Silver medal, No. 283, Mr. E. R. Collins; bronze medal, No. 291, Mr. F. Wise.

CLASS F.—Silver medal, No. F 1, Mr. E. R. Bull; bronze medal, No. 9, Mr. W. Page; bronze medal, No. 11, Mr. F. Smith.

CLASS G.—Gold medal, No. 310, Mr. E. H. Lamb.

OPEN CLASSES.

CLASS H.—Gold medal, No. 348, Mr. W. A. Fraser; silver medal, No. 340, Mr. F. W. Bannister; bronze medal, No. 321, Mr. W. F. Slater.

CLASS J.—Silver medal, No. 416, Mr. W. Illingworth; bronze medal, No. 422, Mr. A. J. Jeffreys.

CLASS K.—Silver medal, No. 13, Mr. C. H. Oakden; bronze medal, No. 6, Mr. E. R. Bull.

CLASS L.—Silver medal, No. 14, Mr. A. E. Smith; bronze medal, No. 18, Mr. G. Thompson.

CLASS M.—Silver medal, No. 7, Mr. F. Goddard; bronze medal, No. 9, Mr. C. H. Oakden.

TRADE SECTION.

BEST TRADE EXHIBIT.—Silver medal, Messrs. Spiers & Pond, Ltd.

## Our Editorial Table.

BACKGROUND DESIGNS.

The Scenic and Decorative Artists' Association, 7, Percy-street, Tottenham Court-road.

From this Association we have received a series of reproductions of the designs to which the backgrounds they are supplying are executed. A speciality is made of pictorial effects in the styles of Romney, Sir Joshua Reynolds, Gainsborough, &c., and in these attempts to escape conventionality the Association appears to us to be extremely successful. The designs, both exterior and interior, are conceived in the best taste, and we should think that studio work accomplished with the assistance of these excellent backgrounds would secure the highest admiration.

CHEMISTRY FOR PHOTOGRAPHERS.

By CHARLES F. TOWNSEND, F.C.S., F.R.P.S. 158 pp. Price 1s.  
London: Dawbarn & Ward, 6, Farringdon-avenue, E.C.

This is the second edition of a volume which we can recommend for a place on the photographer's book-shelf. The title might, perhaps, lead some to suppose that Mr. Townsend only treats of photographic chemistry *per se*, that is to say, the characteristic properties and reactions of the chemicals used in the various processes. But this is not so. What he does is to take the reader through a brief practical explanation of those processes, the chemical considerations so involved being at the same time elucidated and made plain to the reader. This is a capital way of familiarising photographers with the underlying theories of the work they perform in developing, printing, toning, and other operations. There are fifteen chapters in the book, and a seventeen-page cyclopedic index. The photographic image, developers, reversal, reduction, intensification, various kinds of printing, and orthochromatism are among the principal subjects dealt with. Mr. Townsend writes lucidly and unaffectedly, and his book therefore is very easily studied and grasped.

CATALOGUES RECEIVED.

Newman & Guardia, Limited, 92, Shaftesbury-avenue, W.C.

The makers of the far-famed "N. & G." hand and tripod cameras send us a useful little blotting-pad, to which a calendar for 1899 is affixed. Two little pamphlets, which describe how the "N. & G." cameras have been found to behave in New Zealand and the Tropics, were also enclosed, together with a list of the Zeiss stereoscopic binoculars, for which Messrs. Newman & Guardia are the agents.

Dobson & Curtis Brothers, Limited, 10, Suffolk-street, Dublin.

In sending us their latest catalogue of photographic mounts, Messrs. Dobson point out that it is compiled on somewhat different lines to the ordinary photographic-mount catalogues. Their chief aim is to list nothing but what they have in stock and ready for delivery. For the convenience of customers they have arranged sample sets.

## News and Notes.

MR. W. F. SLATER, late of 169, Southampton-street, Camberwell, S.E., has secured more commodious premises at 5, Firs-parade, High-road, Lee, S.E.

PHOTOGRAPHIC CLUB.—Wednesday evening, March 15, Beginners' Night. "Elementary Carbon Printing," by Messrs. Elliott & Sons and Mr. T. Skelton.

RENBOLD'S CAMERA SCREW.—This ingenious little contrivance, which we noticed in our issue of February 24, is not yet on the market. It will shortly be placed on sale by a well-known house.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, March 14, at 12, Hanover-square, at eight p.m. "Theoretical Considerations in Choosing Colours for Three-Colour Printing," by Captain W. de W. Abney, C.B., F.R.S., D.C.L.

MESSRS. PARKIN & FRY, of 31 & 33 Sandstone-road, Old Swan, Liverpool, are the successors to the business of Mr. F. G. Fry, hitherto carried on at that address. Trade enlarging, bromide enlarging, and the manufacture of plates and papers are the firm's specialities.

At the Staffordshire Adjourned Quarter Sessions, on Thursday, 2nd inst., John Henry Williams, aged twenty-two, a photographer, pleaded guilty to obtaining on December 29, 1898, at Stoke, by means of false pretences, the sum of 5s., and also to charges of false pretences at Longton, whereby he obtained 5s. from John Bates and Herbert Shenton. The prisoner, who has been previously convicted, was sentenced to three months' imprisonment with hard labour.

MR. WILFRED EMERY, of 3, Soho-street, W., had the privilege of exhibiting his series of "Folding Ape" cameras at the meeting of the Royal Institution of Great Britain, Albemarle-street, on March 3 inst. The exhibit included the latest additions; a 5x4 with a double swing back, and a 7x5 which only weighs 2½ lbs., and a selection of photographs taken with them. The portability and compactness of these cameras attracted a good deal of attention from the distinguished company.

At the Hammersmith Theatre of Varieties, on Saturday evening last, a series of "animated photographs" was being shown, in the presence of a large audience. The apparatus for working the views was contained in a fireproof room at the back of the stage, and soon after the exhibition commenced something appears to have gone wrong with the films. There was an outburst of flame, followed by an explosion which wrecked the apparatus and put a stop to the show. Andrew Wright, who was working the views, was severely burnt about the face and arms, and appears to have been dragged out of further danger by his colleague, a man named Brock, who escaped any injury to his person. The theatre attendants were immediately on the spot, and in a few minutes the danger of any extension of the flames was over. Meanwhile, the audience had been wondering at the sudden cessation of the views, and were becoming alarmed; but Mr. Hector, the manager, was able to assure them that, although an accident had happened to the apparatus, there was no danger whatever. The injured man was taken to the West London Hospital, and detained. The reason of the accident could not be definitely ascertained; but it was attributed to some fault in the electric current. An official of the London County Council subsequently paid a visit to the theatre, and expressed himself satisfied with the arrangements, and that everything was conducted in accordance with the by-laws of the Council.

## Patent News.

THE following applications for Patents were made between February 20 and February 25, 1899:—

STEREOSCOPIC CARDS.—No. 3790. "Dissolving Pictures for Stereoscopic Cards." T. MITCHELL and M. MITCHELL.

DARK SLIDES.—No. 3939. "Improvements in Photographic Dark Slides and Changing Boxes." A. J. E. HILL and PHOTO, Ltd.

PHOTOGRAPHIC PRINTING.—No. 3978. "Improvements in Apparatus for use in Photographic Printing for Displaying Goods and for other purposes." A. H. BAGNOLD.

PRINTING FRAME.—No. 4015. "The Rapid Photographic Printing Frame." E. C. ARNOTT.

ANIMATED PHOTOGRAPHY.—No. 4024. "Improvements in or relating to Apparatus for Taking and Exhibiting Moving Objects in Motion." A. MILES.

LENSES.—No. 4071. "Improvements in Photographic Lenses." T. R. DALLMEYER.

STEREOSCOPES.—No. 4164. "Improvements in Photo-chromo Stereoscopes; also applicable to Cameras." Complete specification. C. S. LUMLEY, T. K. BARNARD, and F. GOWENLOCK.



## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
13.....	Bradford Photo. Society .....	The Sunny South. E. B. Fry.
13.....	Camera Club .....	Smoking Concert by Members of the Savage Club.
13.....	Kingston-on-Thames .....	Demonstration: Gum bichromate Process. Paul Armfelt.
13.....	Oxford Camera Club .....	Bromide Enlarging. John H. Gear.
13.....	Richmond .....	Palladium Toning. G. Ardaseer.
14.....	Ashton-under-Lyne.....	Last Day for the Nomination of Officers and Committees.
14.....	Beverley .....	Demonstration with Scholzig's Otto Paper.
14.....	Birmingham Photo. Society ..	Demonstration in Printing and Develop- ing of Gravure Paper. A. C. Baldwin.
14.....	Hackney .....	Naples and Pompeii. R. Beckett.
14.....	Leeds Photo. Society .....	Annual Lantern Exhibition of Members' Work.
14.....	Royal Photographic Society ..	Theoretical Considerations in Choosing Colours for Three-colour Printing. Captain W. de W. Abney, O.B., F.R.S., D.C.L.
14.....	Shropshire .....	Demonstration: Subjects of Interest to Amateur Photographers. J. L. Della Porta.
15.....	Brentford .....	Exhibition of Members' Work, &c.
15.....	Croydon Camera Club .....	Demonstration on the Manipulation of the New Printing Process known as Dekko. E. A. Robins.
15.....	Leeds Camera Club.....	The History of Photography. A. Keighley, F.R.P.S.
15.....	Photographic Club .....	Elementary Carbon Printing. Messrs. Killett & Sons and T. Skelton.
15.....	Southsea .....	R.P.S. Lecture: The Selection of a Suit- able Printing Process.
15.....	Woodford .....	Rambles with the Camera. Messrs. Maibly and Noble.
16.....	Ashton-under-Lyne.....	Annual Meeting.
16.....	Bolton Mutual Photo. Society ..	Italy and its Palaces. Rev. H. S. Alderson.
16.....	Camera Club .....	The Early History of Ornamental Turn- ing. J. W. Woodall, M.A., F.G.S., F.R.G.S.
16.....	Leigh .....	Holidays in the Lake District. W. Hampson.
16.....	Liverpool Amateur .....	Auction of Photographic Goods the Property of Members.
16.....	London and Provincial .....	Lantern Night.
16.....	Plymouth .....	Demonstration. A. C. Baldwin (Paget Prize Plate Company).
16.....	Putney .....	A Holiday in North Wales. John A. Hodges, F.R.P.S.
17.....	Croydon Microscopical .....	British Association Geological Slides. W. Whitaker, F.R.S.
17.....	Kingston-on-Thames .....	A'bars and Omdurman. René Bull.
17.....	West London.....	Demonstration: Platinotype. A. O. Beard.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 2.—Mr. E. H. Bayston in the chair.

Mr. JOHN MCINTOSH, of the North Middlesex Photographic Society, read his Affiliation lecture upon

#### INTENSIFICATION AND REDUCTION.

Under the terms of the loan of the paper, only a short abstract can be given, and, though the lecture was largely dependent upon a numerous series of examples of a comparative nature in conveying an adequate idea of the possibilities of the various methods alluded to, the lecture alone was full of good meat and sound instruction. With few exceptions all the methods of intensification and of reduction extant were considered, and exactly those points in which each excelled over its fellows emphasised. In bringing his lecture to a close, Mr. McIntosh, qualified as he is in matters concerning both intensification and reduction, still was honest enough to point out that, while such expedients were often of extreme value, one should not be encouraged to place too much reliance in what was only a last resource, and urged every photographer to so order himself as to attain success as often as possible in his work in one operation.

Mr. J. S. TRAPE referred to a process of reduction which he thought had not been mentioned in the paper—a process which, though simple and easily used, appeared not to be much practised by photographers. It was made up of 1 drachm of a forty-grain solution of bichromate of potash, and 1 drachm of sulphuric acid, in 4 ounces of water. Supposing a quarter-plate negative be under treatment, 10 drops of this mixture are added to 2 ounces of water, varying the proportions as desired. Reduction proceeds equally right through, and Mr. Trape thought it well worthy of trial. Mr. Howard Farmer's method was good enough with a plate which was still wet, but, where the plate had been allowed to dry, the above was very appropriate.

Mr. EDWIN BANKS reminded the meeting of the black-lead intensifier mechanically applied. The procedure with such a method is to submit the plate to a bath of bichromate and glycerine, afterwards drying the negative in the dark. The back of the plate is then exposed to the light and the black lead applied. It has an advantage over the gum method of intensifying, the coating does not wash away, but adheres to the gelatine very tenaciously.

The CHAIRMAN touched upon a method of improving under-exposed negatives by bleaching them with bichloride of mercury, and copying the bleached positive image in the camera.

Some discussion ensued regarding the precise action of the new reducing salt, persulphate of ammonium. It has been described as, first, a reducing

process, followed by the re-formation of the salt of silver into the metal. In this way the thinner places would be re-formed, whilst the high lights would be reduced, not having time to re-form.

Mr. A. HADDON said that, while there was no doubt of the effect of persulphate in reducing the high lights of negatives while leaving the half-tones and shadows untouched, he thought the theory which was last advanced, mentioned above, was somewhat contradictory.

Mr. W. THOMAS said that, until he had first heard Mr. McIntosh's paper some two or three years ago, he had invariably made up for the defective qualities of negatives, where at all possible, by reproducing them from a positive, and in this way it was surprising what an improvement could be effected.

### PHOTOGRAPHIC CLUB.

MARCH 1.—Mr. Walter D. Welford in the chair.

Mr. SYDNEY KEITH gave an exhibition of lantern pictures from photographs taken on a holiday trip up the Nile, commencing with several bits in the swarming streets of Cairo, round the bazaars, and on, by way of the great pyramids and the Sphinx, through Luxor, Abydos, and Philæ, to Assuan. The wonders of ancient Egypt, disclosed in her ruined temples, many of which have yet to be dug out of the sand drifts of centuries, were perhaps of chief interest amongst the subjects chosen by Mr. Keith for his camera, including, as they did, hieroglyphic writings of great antiquity in an astonishing state of preservation. A short chat followed upon the history of Egypt, very fruitful of conjectures upon the colossal undertakings successfully accomplished and the means adopted, and a hearty vote of thanks brought the meeting to a close.

### Croydon Camera Club.—

THE KENTISH PALACE HOME OF THE SIDNEYS.

The main subject of the Croydon Camera Club's Fortieth Public Lantern Show, held on Wednesday, March 1, at the Small Public Hall, was Penshurst Place, that noble and notable pile of buildings which stands in its historic and picturesque park hard by the confluence of the rivers Eden and Medway. The slides illustrating the above were taken on June 28 last, when, by special invitation of Lord de Lisle and Dudley, a large party of members of the Club were given the run of the palace, park, and pleasures in order to photograph what they wished. The slides were described by the PRESIDENT (Mr. Hector Maclean), who began by tersely sketched particulars respecting the building of the palace and some of the notable personages who have dwelt in it. The subjects were made more interesting by the running comments of the lecturer. Many of the slides came in for hearty applause. *Queen Elizabeth's Room*, showing Queen Victoria's coronation stool (Underhill), a fine slide of the *Tapestry Room* (Chadwick Taylor), and the *Armour Corridor* (Watson), are but a few of the seventy views which received marked approval. Besides this rich feast of antiquarian art and nature, the audience was given a peep at Broomhill and its many marvels. That all the features of this remarkable building were not fully illustrated was, the President explained, due to the great affability, the attractive conversation, and the engrossing experiments and demonstrations with which the owner of Broomhill (Sir David Salomons) fascinated the members when they made their memorable visit, so that, although they were loaded with cameras and surrounded by attractive subject-matter, they could not tear themselves away from Sir David and the contents of his mansion of many marvels. Councillor Noakes showed his photographic records made in the land of Burns during the Photographic Convention, including the cottage in which the greatest of all Scotch poets was born. A Highlander entertaining passengers on a Clyde steamer was described as playing the only really musical instrument ever invented, which satirical euphemism for the bagpipes raised a hearty laugh.

Liverpool Amateur Photographic Association.—March 2, Mr. Paul Lange (President) in the chair.—Mr. JOSEPH APPLEBY gave a demonstration on

#### CARBON.

Mr. Appleby demonstrated the working of carbon printing, a process which has been very much revived during late years, and which is the principal process used by modern photographers; in fact, platinotype and carbon are the two pre-eminent processes used by first-class workers. He demonstrated the sensitising, developing, and transferring of the picture, and left a number of specimens illustrating the various colours to be obtained by the carbon process, which will be on view in the rooms for the use of members during the next few days.

Newcastle-on-Tyne and Northern Counties Photographic Association.—At the last meeting of this Association Messrs. W. S. CORDER and GILBERT SPENCE gave a demonstration of

#### PHOTOGRAVURE.

The demonstrators went through the whole process in a most practical manner. In laying down the resist on the copper, which they grained in the presence of the audience, Messrs. Corder and Spence stated that they made a point of thoroughly boiling the water in which the tissue was soaked preparatory to squeezeing, finding by doing so a greater freedom from air bells, which otherwise were liable to form in the minute interstices between the bitumen grain. At the moment of laying down the tissue they also breathed upon the grained copper which also was a help to the same end. After the development and drying of the resist the demonstrators proceeded to etch. At this point they stated that there were three methods of using the perchloride of iron solution—(1) to keep the solution in separate bottles at different strengths, using these in succession on the plate; (2) to commence with a strong solution and gradually weaken it by adding water as the etching proceeded; and (3) to work with a solution at one strength all through, 38° R., the latter being the method recommended by that eminent photogravurist Mr. Huson, which method required that the transparency should be particularly perfect in all its gradations. The method selected by the demonstrators was that of commencing with four ounces of a solution at about



48° B. on a half-plate-sized piece of copper and diluting this with two drachms of water from time to time until about 36° B. was reached. This worked well, two very fine plates resulting. The demonstrators then proceeded to show the method of inking up the plate and finally pulled some very passable prints despite the fact they had only a whole-plate rolling press with blotting-paper as a blanket to work with. The demonstration went through without a hitch, not a "devil" putting in its appearance to stop the facility with which the demonstrators put the plate through the various stages.

**Plymouth Photographic Society.**—March 3, The President in the chair. —Mr. W. J. BELTON, as the representative of Messrs. John J. Griffin & Sons, gave a very interesting lecture and demonstration on

#### VELOX,

and the large number of members present gleaned many bits of information concerning the paper and the chemicals used in the working of it. Mr. Belton said that the paper was a bromo-chloride with very little gelatine, and that by making a suitable selection from either of the two grades, ordinary and special, a good print could be obtained from any kind of negative. The special series was about twenty-five per cent. more rapid than the other. With Velox, exposure was the most important point, and the right amount could only be found by trial (strips across the negative was an economical way). The developer as put up either in packets or tubes, was the same in each case, only the tubes cost money and were charged extra for. Make up the quantity in a four-ounce bottle, and so do without a lot of bottled air, three or four drops of ten per cent. bromide added would be sufficient. The developing was best done with a camel's-hair brush, the kind known as a gilder's mop being the most suitable, but for very large prints make a brush by drawing a large tuft of cotton-wool by means of string through a piece of glass tube. In the printed instructions acetic acid was mentioned and an error is likely to be made, owing to the quantity being given for the American strength of the acid; but, if to 1 drachm of the P.B. article as sold in England 7 drachms of water be added, it will then be about right to use according to the printed formulae given.

**Glasgow Photographic Society.**—March 2, Mr. William Lang, F.C.S. (Vice-President) in the chair.—The meeting was held as a Ladies' Night, and there was a large attendance. Mr. A. LINDSAY MILLER gave a lecture on

#### RAMBLES WITH A CAMERA,

illustrated by about 120 slides made by him from views taken chiefly in Lanarkshire and the Vale of Clyde, the beauty and excellence of which slides should give a fillip to hand-camera work in the district. About thirty kinematographic films, including a number taken during the Egyptian War, were lent and exhibited by Messrs. Rae Brothers, and contributed largely towards making the meeting a success. The Convention film taken by Mr. E. P. Prestwich at the recent meeting held at Glasgow, and which contains exceedingly good and characteristic moving portraits of many of the leaders in photography, was called for a second time and had to be repeated. The meeting was brought to a close by votes of thanks to Mr. Miller, Messrs. Rae Brothers, and to Mr. Prestwich, who had lent his Convention film to the Association for exhibition.

#### FORTHCOMING EXHIBITIONS.

1899.	
March 10, 11 .....	South London. Hon. Secretary, A. E. Allen, 27, Princes-square, Kennington Cross, S.E.
" 14, 15 .....	G.E.R. Mechanics' Institution (Photographic Section), Stratford, E. Hon. Secretary, H. W. C. Drury, St. Oswald's, Downs-road, Clapton, N.E.
" 15, 16 .....	Brentford.
" 20-May 13 ...	National Trades and Industrial Exhibition, Bingley Hall, Birmingham. Manager, Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.
April 3, 4 .....	Beverley. T. J. Morley, Toll Gavel, Beverley.
" 12, 13 .....	Plymouth Photographic Society. Hon. Secretary, W. H. Harris, 91, Cobourg-street, Plymouth.

### Correspondence.

\* \* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### THE FOCAL LENGTH OF A LENS.

To the EDITORS.

GENTLEMEN,—Both "J. F. T." and I have a desire in common to place before your readers the simplest and, at the same time, an accurate method of determining the focal length of an ordinary positive lens without the use of elaborate apparatus. I therefore trespass further on your space for the purpose of elucidation and not controversy.

To measure the distance of the front focal plane from the hood of the lens, when the latter is reversed in the camera and focussed for parallel rays, is an easy matter practically. Temporarily remove the ground glass from the frame of the focussing screen and replace it by one half the size (consider the glass cut in two and one half removed). A rule can now readily be placed inside the camera in contact with the rim of the hood; the distance between hood and screen can then be read off on the rule at

the edge of the ground surface of the glass. A slight error, if it exists, becomes negligible because the final measurement to the hood is made from the object, some distance off.

When the lens is next placed in its ordinary position in the camera, the *locus* only of the back focal plane (position for parallel rays) is required, and no measurement is necessary to determine it.

Measurements are then made of (1) the distance between a near object and the hood of the lens, less the distance between the hood and the front focal plane already found, and (2) the displacement of the focussing screen from the back focal plane, which is necessary to bring the image of the object into sharp focus.

Then the focal length =  $\sqrt{(1) \times (2)}$ .

Concurring with "J. F. T." in the fact that it is difficult to carry out measurements from the "principal" or "nodal" points of a lens, even when they are contained in the mounting of the lens itself, led me to substitute measurements from the focal points or planes, as they are easily arrived at and convenient. By this method the separation of the nodal points need not trouble the photographer, to whom they would be a little puzzling if they were beyond the mounting of the lens, or perhaps crossed.

Allow me to take this opportunity of thanking "Free Lance" for his very civil defence in another matter. I entered a protest on the day of publication. "Free Lance" will, of course, see that "focus" should read "focal length," "negative" should read "positive," and "any object" should read "an object at a given distance."

In thanking you, Gentlemen, for your appreciative reference to the Traill-Taylor lecture, permit me to say that I only had a limited number of these special "pulls" printed, but that any one of your readers who may apply for a copy at 25, Newman-street, is most welcome to it while any are left.—I am, yours, &c.,

THOMAS R. DALLMEYER.

Boscombe, March 3, 1899.

#### ACETYLENE EXPLOSIONS.

To the EDITORS.

GENTLEMEN,—We have seen in your issue of February 10 an account of an acetylene explosion at Chesterfield which has evidently been derived from the same badly informed source as the paragraphs which were published in the papers all over the country.

The explosion is described as an awful and remarkable one, and that two people were injured and several had narrow escapes. In order to investigate the truth of the matter, we sent a representative to Chesterfield to visit Messrs. C. J. Saunders & Co.'s works, where the explosion occurred. After making inquiries, he was informed that the explosion happened as follows: A light was applied to the gas at the outlet, and it burned for a few minutes before the explosion took place, the cause of which was that the air had not all been exhausted from the holder before the acetylene gas was made. So far from any one being hurt, Mr. J. Saunders, Managing Director, wrote to the *Derbyshire Times* on February 11, that the only injuries sustained by any one were very slight, and caused by a small part of the wooden roof falling on to Mr. Richmond's head. You will easily grant that the violent character of the accident has been exaggerated when we say that Mr. Richmond was standing within two feet of the holder, and did not feel the slightest atmospheric disturbance; and the works' Manager, who was standing about ten feet away, did not move his position until the gas-holder had dropped on to the ground.

We beg to submit to you that, so far, there have only been three acetylene explosions in England which have been reported in the Press, and two were caused by the use of badly constructed generators by essentially ignorant people. Further, the number of accidents from acetylene altogether have been very small in proportion to the extent of its use; and the great majority of those that have occurred have taken place on the Continent, and have been caused either by risky scientific experiments or the compression of gas into a liquid form, which latter is strictly prohibited in England. We consider that such paragraphs as the one to which we have taken exception do a considerable amount of temporary mischief to a large and growing industry. Acetylene is known by all experts to be perfectly safe to handle.

We trust you will insert this letter, and are, yours, &c.,

THE THORNTON-SCARTH AUTOMATIC LIGHTING SYNDICATE, LTD.  
Artillery-street, Small Heath, Birmingham, February 27, 1899.

#### PYRO AS A LANTERN-SLIDE DEVELOPER.

To the EDITORS.

GENTLEMEN,—In your issue of the 3rd inst. there is a letter from Mr. Louis Meldon, of Dublin, in which he refers to an article written by me re the development of lantern slides.

In taking notice of this, I would merely remark that I have never experienced the unequal development which Mr. Meldon refers to, and I can confidently say that, provided freshly coated plates be used and the formulae which I gave be closely adhered to, he will not be troubled with any of the defects he refers to. The use of soda with pyro in the development of lantern slides is quite a common procedure.—I am, yours, &c.,

T. N. ARMSTRONG.

Viewfield House, Shettleston, March 6, 1899.



## CATALOGUES WANTED.

To the Editors.

GENTLEMEN.—I enclose notice of last meeting of our Society, which may interest your readers.

You kindly inserted a notice of the formation of the Society in October last. I must say I have been surprised at the want of enterprise shown by advertisers, as, although said notice was inserted in three journals, only three or four catalogues or lists were received by me. One would have thought that the formation of a new Society with about eighty members would have caused a flood of lists, &c., to be sent to its Secretary.—I am, yours, &c.,

S. STEWART, Secretary.

Kirkcaldy Photographic Society, 2 Salisbury-street, February 26, 1899.

[Notices of the formation of societies are not primarily inserted in our columns for the purpose of attracting catalogues, but rather as items of news. However, we have no doubt that the prominence here given to Mr. Stewart's wish to be favoured with trade literature will result in his receipt of enough to satisfy his requirements.—Eds.]

## NELSON'S GELATINES.

To the Editors.

GENTLEMEN.—In your issue of March 3, 1899, we notice, under Answers to Correspondents, the following:—

Gelatine, Chondrin, &c. A. Baker says: "I see by your JOURNAL of September 23, 1898, you believe there is one firm that makes photo-emulsion gelatine in England. Will you kindly give me the address? I think my failures are due to bad gelatine." In your answer you say, We do not know of any firm that supplies gelatine emulsion.

We remember reading, with great interest, an article by C. T. Sutton, on "Gelatine for Emulsion Work," in your issue of September 23, 1898.

It is unnecessary for us to point out to you that a photo-emulsion gelatine and a gelatine emulsion are vastly different things, but at the same time take this opportunity to inform you that for many years we have made photographic gelatines for emulsions. Of late years we have spared neither time nor money in endeavouring to provide a gelatine suitable to all the large plate-makers in this country; but, owing to the variations of their formulæ and the peculiarities of gelatine, we have so far not been quite as successful as we should wish. We now, however, trust in a very short space of time to be able to put on the market a gelatine which will give satisfaction to the largest of the plate-makers in this country.

We venture to enclose you a list of our present make of photographic gelatines, and also a little booklet, *Round about Warwick*, which will give you details of a somewhat extensive and interesting manufactory.—We are, yours, &c.,

GEORGE NELSON, DALE, &amp; CO., LIMITED.

FREDERICK W. NELSON, Secretary.

14, Doughty-hill, London, E.C., March 7, 1899.

[Owing to an oversight, the question and answer to which Messrs. Nelson, Dale, & Co. kindly direct our attention were not so clearly given in print as they should have been. The querist wished to know if gelatine emulsion was obtainable commercially in this country. So far as we are aware, it is not. We shall refer to the enclosures of Messrs. Nelson's letter in our next.—Eds.]

## SPECIMENS.

To the Editors.

GENTLEMEN.—I enclose herewith an advertisement (Wanted, a few dozen attractive cabinet specimens for show-case, toned, unmounted. Price.—H 21, 24 Wellington-street, Strand, London) cut from this last week's JOURNAL, and am wondering in my own mind if you would think me rude or interfering if I was to ask if you couldn't refuse to insert such advertisements. I would ask this for two reasons: First. In the interests of the trade. Photographers as a body are men of honour, and would be ashamed to show as specimens (with a view of obtaining business) work not their own.

Second. In the interest of the public, is it quite right that our leading photographic paper should be the means of deceiving the patrons of photography?

I may, of course, be wrong in my ideas as to what the specimens are wanted for; but I fear the wording of the advertisement leaves little doubt as to the uses they are to be put to.

Trusting you will pardon my apparent presumption in thus writing you,—I am, yours, &c.,

HARRY FRENCH.

P.S.—You are quite at liberty to publish this if you think fit.

[We do not at all agree with our correspondent that the traffic in specimen photographs necessarily calls for the severe degree of discouragement he appears to advocate. It is easily conceivable that a man just starting in business may have nothing of his own production to place in his show-cases for the purpose of attracting the attention of passers-by, and, in such circumstances, if he can procure specimen photographs to serve his object, he, in our opinion, is justified in doing so. Many photographers' show-cases in the

country probably contain enlargements, coloured prints, and so forth, which are not their own work—they are supplied by the trade houses. These, as well as purchased specimens, are placed on view for the purpose of informing the public that the photographer undertakes work of a similar kind. On the other hand, where specimens are used as instruments of deceit or fraud, the highest reprobation is obviously called for.—Eds.]

## RE BIRMINGHAM EXHIBITION, STUDY OF A CHILD'S HEAD, NO. 103.

To the Editors.

GENTLEMEN.—On looking over this week's issue of your JOURNAL, I notice I am accused of copying Mr. Harold Baker's *Geoffrey*. I may state I made my picture when the child was some two years old, he is now six years of age. I had never seen Mr. Baker's picture, or even heard of it, if it was in existence. It was framed in London, and my only instruction was to put it in a crate. Therefore I cannot see how I can be accused of copying a picture I had never seen.

I feel sure you will make this matter all right as it is hardly fair to me.—I am, yours, &c.

ALEX GEEKIE.

Abbotsville, Coupar Angus, N.B., March 4, 1899.

[Our remark was that "Mr. Geekie's *Study of a Child's Head* looks uncommonly like one of Mr. Harold Baker's, *Geoffrey*." The resemblance struck others in the room besides ourselves, including Mr. Baker. We did not impute copying, and therefore have nothing to put right; all the same, we are sorry if in noting an obvious resemblance our remark should have created a false impression on Mr. Geekie's mind.—Eds.]

## THE R.P.S. AND PROFESSIONAL PHOTOGRAPHERS.

To the Editors.

GENTLEMEN.—You have kept us well informed of the aspirations of the chemists and druggists and their attempts to promote legislation for their own interests through the Pharmaceutical Society. The average chemist and druggist and the average professional photographer seem to have many ideas in common, and after the chemist and druggist there is probably no one in business who has such narrow-minded views of business as the photographer. The chemist and druggist is always loudly proclaiming the danger to the public there is in—well, it amounts to this—not giving him a complete monopoly. Your correspondent, "Pro bono Publico," on behalf of the photographers, treats us to the same familiar wail. It is, Protect the public or protect us, as you please to look at it.

We can all recognise the necessity for some restrictions on the sale of poisons, of explosives, and of other articles that might cause harm by indiscriminate circulation, and there seems no practical way of controlling the sale of these things except by restricting it to certain individuals who, in return for the advantages of possessing a monopoly, have to undertake some kind of responsibility; but the worst example of photography ever perpetrated can hardly be considered a dangerous article to any one. Your correspondent says, "It is disgraceful and a fraud on the public that any one can be free to rush into business" (as a photographer) "who has no experience or knowledge of the work." But is not this equally true of the butcher, the baker, the candle-stick maker, to say nothing of the tinker, the tailor, the cobbler, the nailer, and is it true at all? The one cabinet and six *cartes* for 3s. 6d. man may turn out atrocious photographs, but he must satisfy the class he caters for, or his customers would not come again, and, more important to him still, his customers' friends would not come to him—a photographer's is not a chance trade.

From the narrow point of view your correspondent looks upon these matters, they may be trusted to right themselves. The man who gives the good value for the money, as the public consider, if his methods are fairly businesslike, will always succeed.

Your correspondent asserts "that a man may be F. or M.R.P.S., and yet not qualified to conduct a business as a photographer." Granted; but, taking all the respectable photographers in the kingdom, and "respectable" I will define as those whom "Pro bono Publico" would think worthy of being included in the Ring, how many are qualified to conduct their business on the same business lines that a draper, a tailor, or a bootmaker, would find necessary? It is no uncommon thing for a photographer to take ten days to deliver a proof, and months to deliver a dozen photographs, the light is so bad this time of the year, &c. The photographer who wails and weeps over want of work is almost always far behindhand with the work he has. Goodness knows what would happen if he had as much to do as he thinks he deserves.

With regard to the R.P.S. "and the profession." It is clear that the Society, from its constitution cannot do much to butter the bread of the ordinary photographer, the portraitist whose bread depends upon turning out so many portraits at so much per dozen. The Society is instituted for the advancement of photography, and only incidentally for the advancement of photographers. The majority of its members, the country members in particular, gain little directly, but are content to



subscribe to it for the sake of the work it does in advancing photography. The ordinary photographer is not, as a rule, a supporter of the Society, or of any photographic society, and, as a rule, he hates photographic societies. At photographic society meetings they talk openly of things he wants to keep secret. He does not want to tell what he knows, and he does not want to learn anything. His interest in the advancement of photography is only an *l. s. d.* one.

Professional photographers cannot even combine for their own interests. Where is the Photographers' Benevolent Association now? That was an institution for the benefit of professional photographers, and, with a reasonable amount of support from the profession, would have become a credit to it and a valuable aid for the sick and wounded. For years it lingered on, almost entirely supported and administered by amateurs and dealers, for the benefit of the professional photographer, who would not help himself, but was quite content to allow outsiders to pay for him and work for him. Where is the National Association of Professional Photographers? That came to grief, after a very brief existence, because its members did not know what they wanted, and, if they had done so, would have had no idea of how to set to work to get it. I am almost ashamed to sign myself

A PROFESSIONAL PHOTOGRAPHER.

### OPERATORS AND AGREEMENTS.

To the Editors.

GENTLEMEN,—About eleven months ago I was offered an engagement at a photographer's at Weymouth as managing operator and artist at a salary of 3*l.* 10*s.* per week, with the understanding that, after a month's trial, if my work proved satisfactory, I was to have a two or three years' agreement. I gave every satisfaction, and the agreement was to be drawn up. Upon the strength of this promise I took a house yearly, and brought my wife and family. However, from that time until about three weeks ago the agreement was not forthcoming, various excuses being given as the reason. Well, about three weeks ago (about the slackest part of the year) an agreement was handed to me, with the intimation that I could either sign it or leave. As the so-called agreement was not only not equitable, but thoroughly unfair, I declined to sign it.

I enclose a copy of the document, which I trust you will see your way to publish as a warning to assistants.—I am, yours, &c.,  
Weymouth, February 28, 1899.

OPERATOR.

"An agreement, made — day of —, one thousand eight hundred and nine-nine, between —, of Weymouth, in the county of Dorset, Photographer, of the one part, and —, of Birmingham, Photographic Artist, of the other part.

"Whereas the said — has agreed to take the said — into his service as his chief photographic operator, retoucher, artist in black-and-white and colours, in his business at Weymouth aforesaid, at the weekly salary of three pounds and seven shillings, and, in consideration of such agreement and of the salary paid to the said — mentioned, he, the said —, has agreed to enter into the engagement hereinafter contained.

"Now it is hereby agreed as follows:—

"1. That the said — will pay the said — for his services the weekly salary of three pounds and seven shillings.

"2. That the said — will conduct himself properly and faithfully during the said term, and will daily to the best of his ability execute the duties of photographic operator, &c., for the said —.

"3. That the said — will not during the engagement created under this agreement or at any time thereafter, without the written consent of the said —, commence or carry on, either alone or with others in partnership, the business of a photographer in Weymouth or within a radius of thirty miles from the town of Weymouth, nor engage himself to any other photographer within a like radius, either as operator, retoucher, or otherwise, and as often as he shall do so he will pay to the said — the sum of two pounds for every week during which he shall commit such breach, and such amount shall be recoverable from the said — as ascertained liquidated damages.

"4. If the said — shall not carry out his duties to the satisfaction of the said —, or shall not in all things observe, perform, and fulfil the conditions of this agreement, the said — shall be entitled to discharge the said — upon giving him two weeks' notice to leave his employ, and, upon such notice being given, the said — shall leave such employ accordingly at the expiration of such notice; but he shall continue to be bound under clause 3 of this agreement.

"As witness the hands," &c.

### THE LEEDS CAMERA CLUB AND THE YORKSHIRE PHOTOGRAPHIC UNION.

To the Editors.

GENTLEMEN,—I have read with some considerable amount of amusement Mr. Warren's letter in this week's issue, and I am bound to acknowledge that, as a literary effort, it would be difficult to equal it.

To subject this epistle to analysis is to spoil its beauty, divest it of its verbiage and scarcely a tissue of solid argument remains. My opponent's references to ancient history and mythology impart a distinctly literary flavour to what might otherwise have been a prosaic and commonplace discussion. My friend, Mr. Warren, will pardon me for saying that his game of ridiculing an opponent, instead of tackling his arguments, is as old as the hills, and it is almost impossible to score with it. Mr. Warren's reference to Alexander is a little *mal-a-propos*. That distinguished gentleman, if history libelleth him not, was invariably the

aggressor, while, on the contrary, the present writer confines himself to taking the defensive attitude.

I will take Mr. Warren's points in detail. He reaffirms his atomic theory as applied to individuals and to photographic societies. Shades of Dalton, Huxley, and Tyndall! A repellent and conflicting atom, with a coherence and attraction for other and similar atoms, is a startling phenomenon. I have already proved this theory of atoms, as applied to photographic societies, to be, as the logicians say, *argumentum ad absurdum*. To make the analogy perfect, the photographic atom should lack the forces of cohesion, affinity, and attraction, all of which the photographic unit now possesses in a remarkable degree. I must press this point home, for this is the bone of contention between Mr. Warren and myself. My opponent says that societies cannot federate, because their interests are so conflicting, and then he builds up an astonishing theory of molecular force, which is not analogous or true to facts. Again, I repeat, there must be some common ground of agreement, affinity (to use the chemical term), or there would be no combination of units in the shape of societies.

I would venture to remind Mr. Warren of an old Yorkshire story, which, so far as I remember, is as follows: An old countryman, for some trivial offence against the laws, was placed in the village stocks. A small group of his old cronies gathered round to condole with him, and generally discuss the situation. One of them, evidently of a legal turn of mind, turns to the culprit, and gravely informs him that the powers that be cannot place him in the stocks for the offence with which he had been charged. The victim savagely retorts, "Can't tha? but tha her done, and awm here na." Now for the application to this little story: *conflicting atoms*, i.e., photographic societies, we are told, cannot be federated; but they are being amalgamated, fifteen already, and more to follow.

I have already stated that I admit the right of the Leeds Camera Club to do the best it can for its own interests, but I do not admit the right of its President to attack the Union without first trying to understand the details of its constitution. I have also further stated that the eight Bradford gentlemen have ceased to exist as a provisional Committee, and that the three delegates who have been elected constitute all the representation to which that Club is entitled.

Mr. Warren accuses the provisional Committee of having attempted, in a *hole-and-corner* fashion, to appoint him as Treasurer of the scheme. I have already denied, in a letter to Mr. Warren some weeks ago, the truth of this accusation. Neither myself nor my Committee had anything to do with that election, and I protested at the meeting that the appointment was a blunder, and that Mr. Warren would not accept the position. I will take this matter a little further. Mr. Warren says this *hole-and-corner* appointment was not made at the meeting referred to. Now, Sir, your reporter was present, and the *Photographic News* contained the announcement that Mr. Warren was appointed Treasurer *pro tem*. Where did that reporter get his information?

In conclusion, let me say that I am quite prepared to meet any attacks which may be made on the scheme as an honest attempt to deal with the problem, but cannot be expected to prove the possibility or otherwise of performing miracles. The Yorkshire Union is entitled to expect from Yorkshire societies, until the scheme has had a fair trial, an attitude of benevolent neutrality. Shakespeare says, "'Tis not in mortals to command success," but the delegates of the Union will do more, they'll deserve it.—I am, yours, &c.,  
EZRA CLOUGH.

13, Chesham-street, Bradford.

NORMANDY.

To the Editors.

GENTLEMEN,—I note the request of "Rambler," as to Normandy, and, if you like to put him into communication with me, I can perhaps help him, having made three autumn holidays there with camera, and visited some twenty towns in Northern France and Normandy, though but little on the coast, except Dieppe and Fécamp. I found the coast places rather uninteresting, and prefer the picturesque qualities of the older towns, as Caen, Rouen, Caudebec, and Lisieux.

It is "too large an order" to ventilate this matter in the *JOURNAL*, but "Rambler" can put any questions he likes to me and I will answer them as well as I can.

As to figure studies, there may be plenty in the fishing population, but there is also no lack of them among the "antiquities" of the market stalls and fish markets of the interior towns.—I am, yours, &c.,  
GEORGE BANKART.

My work was all done on plates 11×9—about 180 negatives in the three holidays.  
West Walk, Leicester, March 4, 1899.

### AN ASSISTANT'S DILEMMA.

To the Editors.

GENTLEMEN,—Re the above question, my experience is very much the same as "F. S.'s." As a rule, I answer four to six advertisements each week, and the usual thing is no replies; and, if so, it is no good, and many a time specimens even never returned. I should like to know how I can get at the advertiser when there is only a number to the advertisement. I answered an advertisement the other week which ran something



like this: "Wanted, good operator and retoucher, &c., to manage branch; married. Apply, references, specimens," &c. I was lucky or otherwise to receive a reply from them, and the magnificent salary of 11. a week was offered. I should like to know how a married man is going to manage on this, as it is simply ridiculous. It certainly shows that the country is over-crowded with photographers if a firm expects to get a man for this figure.

I am considered a first-class operator and retoucher, &c., so that it is not from lack of ability I don't get a berth.  
Trusting you will insert this,—I am, yours, &c., J. A. H.

#### To the Editors.

GENTLEMEN.—In reference to the above, "W." and "F. S." are certainly not the only assistants who find it difficult to get into a good situation. Good situations are scarce, also good assistants. I should be pleased to hear the definition of a first-class assistant. Having been an assistant for over ten years, I can only conceive a good assistant to be of unsurpassable beauty of physique and culture, also a scientist and artist of exceptional ability, and to receive the handsome remuneration of 30s. Not being up to that standard, I must be satisfied with 25s. for a permanency of eight months. This being the idea of a photographic professional who has the honour of M.R.P.S. attached to his name, and who thinks that a reference of this description,—

"Mr. — has been in my employ, and can recommend him as an all-round man. He is very attentive to his duty.—Yours, &c., M.R.P.S.—"

would prove beneficial to his late assistant, who has done all his retouching and part of his operating. This is merely the truth, and my opinion is that, after a few more assistants are served in this manner, they will make a desperate attempt to form a union for the purpose of obtaining more just treatment.—I am, yours, &c., A. A.

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

#### PHOTOGRAPHS REGISTERED:—

A. G. Field, 5, Alston-place, Maidstone.—Photograph of Karl Marx.

H. Colebrook, 5, Grosvenor-terrace, Station road, Sidcup, Kent.—Photograph of steam-boat "Oceans."

J. Landon, 134, Queen's-road, Watford, Herts.—Photograph of Mr. and Mrs. Crawley and family, who were poisoned at Watford on February 10, 1899.

F. T. Blackburn, 2, Station-road, Budleigh Salterton.—Three photographs:—1. Photograph of hailstones grouped together in tray, the hailstones weighing half an ounce each. 2. Photograph of the Rev. Robert Charles Price, sitting with a book open on table. 3. Photograph of Miss Isabella Warrington, with cap and apron on (bust).

RECEIVED.—W. BARRY; AJAX; S. TALLON; G. W. YOUNG; H. BARRETT. These and others in our next.

"AN ASSISTANT'S DILEMMA."—Will "W." send us his address? A letter awaits him.

THOS. STEVEN.—You would be liable to an action for infringement if the engraving is copyright.

H. M. WARD (Leicester).—Many thanks for the cutting, which had reached us from several other sources. The paper in question is acquiring an unenviable reputation for printing the most ridiculous rubbish about photography.

COLLODION PROCESS.—C. BANCRO. The ferrous-oxalate developer as used for gelatine plates is of no use with wet-collodion plates. The proto-sulphate of iron (acidified), as given in the manuals, must be used. The two processes are widely different, which you do not seem to realise.

DESIROUS.—A very good photograph indeed, but the subject is so commonplace and unpicturesque that you would hardly be justified in sending it to an open exhibition. Do you ever visit the exhibitions? Unless you do so, you are working in the dark if you aspire to success in open competitions.

DAMAGE TO STUDIO.—S. S. says: "During the late hurricanes several large squares of glass were broken in the studio. Who is to make them good, the landlord or me? I have the place on a fourteen years' lease, and have to do the repairs; but I am told this is not fair wear and tear, but the 'act of God,' and that the landlord must do the needful. That he denies."—As you hold the premises on a repairing lease, you will have to make the damage good, if done at all.

CAMERON.—You omitted to sign your name and address. However, in reply: 1. A denser negative is required in the first-named process. No difference in the lighting is required. 2. Theoretically all lenses of equal aperture are of equal rapidity; focal length has practically nothing to do with it. 3. The glasses you name give a slight but scarcely appreciable increase of rapidity. 4. See reply to No. 2. 5. Yes; because the portrait lens works at the larger aperture. You evidently require to consult an elementary work on photographic optics.

COPYRIGHT.—W. RHYS JONES asks: "Would you kindly inform me as to whether I would be breaking the law of copyright in selling an enlarged copy of photograph taken twenty-two years ago."—In reply: If the copyright of the original is in force, you would render yourself liable to action for infringement.

M—PHENYLENDIAMINE.—PHOTOGRAPHER says: "Would you kindly let me know where I could be likely to obtain M—phenylenediamine, as recommended for new platinum toning bath, in JOURNAL of February 17?"—In reply: Messrs. Zimmermann, St. Mary-at-Hill, or Messrs. Fuerst Brothers, might procure it for you.

AGREEMENT FOR SERVICES.—ASSISTANT. If you are entering into an agreement for a year's services, have the agreement in writing, and stamped, otherwise you may find yourself in the same predicament you say your predecessor was at the end of the season, and as many others have done with verbal agreements—with some employers.

A. L. (Paris).—We presume you refer to a photograph to be taken in London. —In reply: 1. No permission is needed for street photography in England. 2. There is no liability for damages. 3. No. 4. Neither is liable. 5. The architect cannot object. 6 and 7. No, he cannot sue him. It all amounts to this, that in England street photography is absolutely free.

H. J. B.—A search at the Trade Mark (Patent) Office would be necessary to find out whether "Celloidene" is a registered word or not. "Celloidin," however, is a word frequently used, especially on the Continent, to denote collodio-chloride paper, so that you would be getting uncommonly near an already recognised term. We should advise you to choose some other word.

DEVELOPING MARKS.—BEGINNER. The wavy or mottled markings are caused by the plate not being rocked while being developed. Although the negative may require a long time in developing, the developer should be kept in motion the while, though more at the first part of the time than is necessary at the later stage of the development; but it should not be allowed at any period to be at rest for long. There is no doubt as to the cause of the markings.

SPOTS ON PRINTS.—F. DOWDALL says: "Will you inform me the cause of spots on enclosed print, there are half a dozen with similar marks out of a large batch; is it the water, or do you think it might possibly be dust settling on them while spread out to dry?"—The spots may be due to either of the suggested causes, or several others; but it is impossible for us, by merely looking at a print, to say the precise one. See article on page 83 of our issue of February 10.

A COMBINED BATH.—PYRO says: "Re 'A. J. B.'s' inquiry in your valuable JOURNAL of last Friday for a combined toning and fixing bath, I venture to offer the following formula, which I have used with every success: 6 ounces of hyposulphite of soda, 6 drachms of sulphocyanide of ammonia, 32 ounces of water, 14 grains of gold. This bath to be made twelve hours before using, and tones from red to blue may be obtained easily with it. It is advisable not to throw away the old bath, but use half old bath and half new. This bath should tone between six and seven sheets of paper."

DEAD BLACK STAIN.—J. W. says: "I have searched through back numbers of JOURNAL and ALMANACS for a great many years, and can't find a reliable stain for brass for the purpose of reblacking lens stops, &c. The much-repeated copper nit. not being successful in my hands, can you say what is used by opticians for giving that beautiful dead black on the inside of lens mounts (a stain, not ivory black and shellac), black bands around lenses, and such work, as I am remounting an old lens with which I have done much work for about twenty years?"—The receipt given on page 972 of the ALMANAC has never failed in our hands. Another method of blacking brass is to thoroughly clean the metal, warm it, and then dip it in a weak solution of bichromate of platinum. Probably your failure has been due to the metal not being perfectly clean.

GLASS POSITIVES AND FERROTYPES.—OLD LITHO writes: "I have bought an old camera and lens of a shop-mate, and I wish to try my hand at photographing, only for amusement, and I wish to ask, would you give me in your correspondence a receipt for making a silver bath, a developer, and fixer, for glass positives up to date, and will same do for ferrotypes; if not, will you oblige? I have not come across yet, in your ALMANAC, anything to assist me, or, if you know of any publication that would assist me, I should be thankful?"—Formulae for sensitising bath, developer, and fixing solution are given on pp. 1056, 1057 of the ALMANAC. The solutions that are good for glass positives will also do for ferrotypes. Any of the old manuals of photography of fifteen or twenty years ago, Hughes for example, give the manipulatory details of the process. If we mistake not, Fallowfields publish a pamphlet on the ferrotype process.

AMMONIO-CITRATE OF IRON.—J. G. WILLIAMS says: "Enclosed was made from formula as follows: \* A. Ammonio-citrate of iron, 35 parts; tartaric acid, 4 parts; distilled water, 200 parts. B. Gelatine, 6 parts; distilled water, 100 parts. C. Silver nitrate, 10 parts; distilled water, 100 parts. Above mixed and applied with brush, as directed in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1899, p. 937. \* Formula given says green ammonio-citrate of iron, but local chemist did not know this, and supplied me with the ordinary brown-scale crystals. Is this an error? I should be glad if you could advise me as to probable cause of the brown stain left in the paper, which, I presume, ought to have cleared out."—We quoted the two formulae as given by the authors of the two methods. Probably the paper itself is at fault, having a reducing action on the silver. Try the formula with the ammonio-citrate of iron you have on a better paper, that of the post card enclosed is of the commonest description and very different from that of the cards issued by the Post Office. Messrs. Marion & Co. supply material for the purpose.



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## EX CATHEDRA.

THE Invitation Section of British Pictorial Photography, which is to be made a prominent feature of the International Photographic Exhibition at Florence in the months of April and May next, will contain about a hundred photographs and several original photogravures. We append the names of the exhibitors, by which it can be seen that the section will be fully representative: Messrs. J. Craig Annan, E. R. Ashton, Rev. F. C. Lambert, Messrs. Tom Bright, H. Stevens, W. Crooke, F. M. Sutcliffe, Rev. C. J. Moncrieff Smyth, Viscount Maitland, Messrs. Karl Greger, John A. Hodges, R. W. Craigie, W. Thomas, Leslie Selby, F. Seyton Scott, H. M. Hastings, E. E. Barron, Eustace Calland, H. E. Davis, A. Burchett, R. Belfield, H. Wilmer, Basil E. Lawrence, H. Vivian Hyde, T. Manly, W. M. Dodson, F. Hollyer, Charles Emanuel, W. J. Warren, R. Cocks, and W. Smedley Aston. To Mr. H. E. Davis, who has organized the section, great credit is due for having got together what can easily be imagined will be a worthy display of British pictorial photography for the inspection and study of Italian photographers.

THE March number of the *Camera Club Journal* contains the following announcement: The Committee have under consideration a scheme for removing the Club to much larger premises, and are engaged in making inquiries as to the prospect of attracting a sufficient number of new members to support the undertaking. Should the Committee eventually decide to recommend the scheme, it will immediately be placed before the members, and will be brought forward for their decision at the next Annual General Meeting.

\* \* \*

BRITISH photographers are not alone in the position of having to apprehend and cope with uncalled-for attempts to amend the law of copyright to their disadvantage; their American brethren are just now being menaced in a similar way. One of our transatlantic exchanges tells us that a new copyright amendment of far-reaching importance is now before Congress. The exact text is as follows: "Provided that on and after the first day of July, 1899, no person shall be entitled to a copyright unless the copies deposited with the Librarian of Congress of such copyright book or other article, or the photograph deposited of a work of the fine arts, shall be of such substantial and permanent paper or substance, and ink and impression, as shall be according to such standard as shall be from time to time established and approved by said Librarian." Our contemporary points out that no provision is made in the law for the publication of standards, and, as the law requires that two copies must be deposited with the Librarian on or before the date of publication, an error in not complying with the standards would necessarily result in a loss of the copyright. The American Copyright League has directed its counsel to file a protest against alterations of the copyright statutes which seemed to clothe the Librarian with arbitrary power, not only of establishing a standard, but of altering it at will. Provided that some intelligence is employed in defining a standard for photographic prints, American photographers have nothing to fear from the proposed amendment; the quality of photographic paper is necessarily of the best. We shall, however be curious to note if the desiderated "permanency of impression" includes, or excludes, silver prints.

\* \* \*

IN the course of a letter from Mr. H. Snowden Ward, who is at present lecturing in the United States, he tells us that there



seems little photographically new there except the inclination to approach the Paris Exposition people, through the U.S. Government, with a view to getting pictorial photography recognised as a subject worthy of a department of its own.

\* \* \*

To the well-known house of gelatine-manufacturers, Messrs. George Nelson, Dale, & Co., Limited, of 14 Dowgate-hill and Warwick, we are indebted for a copy of a little book, *Round about Warwick with a peep into the gelatine Factories at Emscote Mills*. The letterpress is by Mr. Alfred Barnard, who writes appreciatively of Warwick, Leamington, Stratford-on-Avon, and other world-famed places in the neighbourhood, around which the glamour of historic interest and picturesqueness is eternally thrown. There are many good half-tone reproductions of photographs in the book, which is sent free on application to Messrs. Nelson at the address above given.

\* \* \*

ABOUT thirty-six pages of the book are devoted to a descriptive illustrated account of the famous gelatine works at Emscote, and portraits of the past and present heads of the firm are given. We learn that the business was established in the year 1837 by the late Mr. George Nelson. The manufacturing buildings cover five acres, and the preparation of gelatine, for photographic purposes, is conducted in one of the factories that is especially set apart for the purpose. Messrs. Nelson's business is, of course, chiefly devoted to the production of gelatine for culinary, confectionery, and cognate purposes, and Mr. Barnard gives his readers an interesting account of the process of manufacture which the raw material, hides chiefly shipped from Singapore to London, goes through in the course of its evolution into the dainty product, gelatine, which has so many invaluable uses in domestic economy to-day. Messrs. Nelson's staff, notwithstanding the elaborate machinery employed at the works, numbers 250; and the relations between employers and *employés* appear to be of a singularly cordial character, Emscote being quite a model village, having a Nelson Club, theatre, and so forth.

\* \* \*

As many of our readers may not be acquainted with the variety of gelatines which Messrs. Nelson, Dale, & Co. prepare for exclusively photographic purposes, we here give mention of each. They are as follows:—*No. 1 Photographic*: a readily soluble gelatine, very suitable for mounting and enamelling photographs, &c. *No. 2 Photographic*: possesses a little less solubility. Suitable for the manufacture of gelatino-bromide and gelatino-chloride emulsion papers, for collotype, and similar photo-mechanical printing processes. *No. 1 Autotype*: prepared especially for the manufacture of the tissue used in the carbon process, &c. *No. 2 Autotype*: useful for the preparation of transfer paper for carbon printing, &c. *X Opaque*: a hard gelatine, capable of absorbing a considerable quantity of water. Useful for collotype and similar processes, and in the manufacture of dry-plate emulsions where a hard gelatine is required. *S. D. P.*: specially prepared for gelatino-bromide or chloride emulsions, either for dry plates or paper. *Amber*: a soft gelatine of value in the Woodburytype and similar processes; also useful as a mountant for photographs, &c. *D. 1.*: suitable for the preparation of dry-plate or paper emulsions.

WE have again to convey to many secretaries of societies who have favoured us with reports of meetings an explanation of the non-appearance of those communications in our pages. It is simply that either the reports contain nothing of interest to the general reader, or that the information recorded is in the nature of a twice-told tale and has grown stale in the telling. We ask all whom it may concern to note that in future we cannot undertake to print reports which are mere repetitions of what have previously been published in our pages.

#### FILM TROUBLES.

THE time is approaching when photographic *débuts* are pondering whether plates or films shall be their choice, the near approach of spring being generally the starting point for camera work. Each of the two has its advocates, and each its advantages and disadvantages. The readiness of chemical manipulation with plates under all circumstances, as opposed to the trouble of developing continuous films, is set off against the incontestable convenience of a roll of sensitive material when travelling away from home with intention of developing, and so on. Our present purpose, though we hold no brief for the film-manufacturer, is to point out some of the small ills attaching to their use, with some methods of avoiding them. This we shall do at some risk of appearing to write for the mere tyro.

Starting at the beginning of the career of the film, we may note that we have seen a good number of films injured simply through carelessness in starting the unwinding of the spool. If the first attachment of the end of the film to the unwinding spool be not done so that the unwinding film lies quite square to the store spool, the film, as it is gradually unwrapped, will be crimped at the edges, the creases sometimes extending far enough to injure the details in the film, but always to an extent that forms a danger of starting frilling in development.

A mishap with daylight spools, not uncommon with beginners, will happen when cutting up the film into sections for developing. The roll is laid down on the table, and, when taken up, something seems to have gone wrong, "the maker has put the film the wrong side out, and hidden the numbers printed on the black paper." The cutting, however, is done against the marks for the purpose, and, when development takes place, a number of views are found to be cut through the middle. This happens through the film having been allowed to wind itself once round the whole roll, and so reversed its relative position. When this happens for the first time, the puzzle is so complete as to be more like a conjuring trick. We have seen many views so unconsciously bisected.

With regard to the various modes of arranging the film for development, we will not touch upon that at the present time. It would afford matter enough for several articles to show the relative merits and demerits of cutting up the film into pieces each representing one view; cutting them into sets of two, three, or more; developing them attached to glass, or detached from any support; on rollers, or flat in long dishes, &c.

With regard to the plan of attaching lengths of films by means of the strips of adhesive caoutchouc tape described by us some time ago, the plan has been well liked, but a difficulty has been experienced through a portion of the rubber attaching itself to the back of the film, and being difficult to remove. The remedy is to lay the film, back uppermost, upon a sheet of paper, and, holding it firmly down with one hand, push the sticky rubber firmly forward with one finger towards the edge



of the film. It will, if properly done, collect in little balls and separate itself; any slight smear remaining may be taken off at once by a slight touch with a pledget of cotton-wool dipped in benzole.

We have had complaints of the frilling of films with the continuous lengths far more than with plates. This is a most serious evil. The best remedy is to keep a sharp look-out for five or ten minutes after washing, and, if the slightest signs of incipient frilling become manifest, to at once immerse the films in a five per cent. solution of formalin. Usually all further frilling will at once be arrested. Should, however, frilling have taken place to an extent threatening the whole of the gelatine surface, the simplest plan is to "let it go"—actually assist the frilling—and, when the whole film is loosened from its celluloid base, to insert a glass plate underneath it and take it up film and glass together, gently drain, and allow them to dry. There will then be a glass instead of a celluloid negative, and, usually, of slightly enlarged dimensions. *En passant*, let us say that it is better, when "collecting" the film on the plate, to let one edge slightly overlap the edge of the glass; there will then be no risk of the whole film slipping away when the glass and film are put up to dry.

Before leaving the subject of frilling, it is desirable to point out that the formalin remedy must be applied at an early stage, for, if, as in cases which have come under our notice, a considerable portion, say a third or a quarter of the film be loosened and then the formalin be applied, it is true that in all probability further frilling will be stopped; but that part already detached will be expanded, and will, upon drying, show wrinkles, and, further, will appear of different density from the normal portion of the negative. When this is found to be the case and the formalin is made use of, it will be impossible to detach the film altogether by any after-process for the purpose of attaching it to glass, as no method that we have met with, short of dissolving the celluloid away, will enable the gelatine to be separated; so firmly does the formalin seem to keep it attached to the celluloid foundation. Indeed, even were it possible to detach it, this portion would be non-enlarged and the difference in density would still be palpably manifest, and the wrinkling of the enlarged portion could not be got rid of even by immersion in methylated spirit, which, as is well known, will reduce under ordinary conditions a swelled film to its original dimensions, as in the method of transferring a film by the aid of hydrofluoric acid.

We find that a single article will not suffice to include all difficulties we should like to treat, and we purpose, therefore, to take up the subject again on a future occasion.

**The Recent Cinematograph Accident and the County Council.**—It is not always that we agree with the doings of the London County Council, but the regulations they have framed, together with the conditions laid down by the insurance companies, no doubt averted what might have been a serious accident at the Hammersmith Theatre of Varieties, which we reported last week. A fuller account tells us that everything was ready at hand in case of accident—a fireman with hose, wet blankets, &c.—and it took but a few seconds to extinguish the flames. As the apparatus was behind the screen, the audience knew nothing of the accident till told by the manager that the apparatus had gone wrong. Had the cinematograph been placed in the auditorium, those present would have seen the blaze, and perhaps a panic would have been created, and with serious consequences. These continuous accidents, though fortunately hitherto without any very grave results, do not tend to inspire confidence in the general public, who, in the case of

an alarm have in mind the Paris catastrophe a year or two back. When shall we have a non-inflammable film that can be used in the cinematograph? There is a fortune awaiting some one; for, if such a film were forthcoming, there is little doubt that celluloid films would be prohibited by County Councils.

**Poisoning by Cyanide of Potassium.**—Cyanide of potassium is not much used in photography at the present time, except for fixing collodion negatives, positives, and ferrotypes. In the old wet-collodion days, when it was to be found in every dark room, suicides through it were by no means uncommon, and there were instances of its being swallowed in mistake for something else. In all cases that have come under our notice death occurred within a very brief period—generally a question of minutes. On Friday last an inquest was held on the body of a man who had committed suicide by taking cyanide, and the remarkable thing in the case was that he lived so long after swallowing the poison. It is stated that he drank half a pint of the solution. A doctor was sent for, who refused to attend, but advised the man's being taken to the hospital (St. George's). Now, from the South Kensington Museum, where the occurrence took place, to the St. George's Hospital is a long distance, yet the man was alive and conscious when he arrived there. It is obvious from this, that either the half a pint of solution was very weak, or that it was made with a very inferior cyanide.

In formulae for fixing collodion negatives, glass positives, or ferrotypes, so many grains to the ounce of water are given; such is also the case with a solution for "restoring" Daguerreotypes; but it is obvious that much must depend upon the cyanide itself. In a wholesale price-list now before us we find cyanide of potassium quoted as thirty, forty-five, seventy, and ninety-five per cent., the price varying from one to three shillings the pound, while the pure crystallised salt is quoted at twelve shillings a pound. Old workers, who use the cyanide for either of the above purposes, usually keep a strong solution of the salt of indefinite strength, and dilute it in such proportion as may by experience be found necessary. We have alluded to this matter because we have heard that some have failed in cleaning Daguerreotypes when using the strength given in formulae, while others have spoilt the pictures with a similar quantity of the salt.

#### **Alleged Discovery of Pictures at Hampton Court.**

—An account has been going the round of the papers during the last two or three weeks of the unexpected finding of some valuable paintings at Hampton Court Palace. Now, as a matter of fact, they were never lost, as their existence and whereabouts were known all along, and described in old guide-books. They are painted on the walls of Queen Anne's Drawing-room, but they had been covered with canvas and other pictures hung over them, because they were considered of little merit at the time. The paintings are by Verrio. They are now to be repaired, the nail-holes made in hanging the other pictures are to be filled up, the work made good, and the paintings restored to their original condition. The pictures which hung over these "recently discovered paintings" have been removed to the walls of Kensington Palace, which is shortly to be opened to the public. Amongst those removed is West's Collection, in which is included the *Death of General Wolfe on the Heights of Quebec*, that for many years hung on the walls of the Queen Anne's Drawing-room.

**Is it a Forecast?**—On several occasions, when the Budget is "in the wind," suggestions have been made that there should be a tax on photographs; but, of course, the proposal, up to the present, has received no serious consideration. In last week's *Punch* there is a full-page illustration by Mr. Linley Sambourne, below which is: "I shall have to take it out of some of 'em. The question is— which?" The picture shows the Chancellor of the Exchequer, and the background and foreground are made up of a great variety of



articles, such as pipes, cycles, pianos, &c., and cameras. It is noteworthy that while the different things depicted are mostly confined to one of each, there are four or five cameras—hand and stand—shown in the picture, and they are given great prominence. From this it would seem according to Mr. Sambourne's idea, that some of the deficit to be dealt with in this year's Budget may be obtained from photography. Let us hope that the Chancellor of the Exchequer's and Mr. Sambourne's ideas do not run in the same groove. Still the former will "have to take it out of some of 'em."

### JOTTINGS.

I AM told that the first paragraph in my last month's Jottings was not quite accurate. "Exit Bennetto; exit Sellé," said I. It appears that the Sellé process still occupies the stage. A company to work the Doctor's three-colour patents is in process of formation, and the prospectus may shortly be expected. Three-colour colotype, three-colour films superposed on glass and paper, and three-colour block work are to be the Company's leading lines, to which additions are to be made by means of some recent patents that have been taken out by Dr. Sellé. This reads like business, at any rate.

And, indeed, the sooner we get to business in some of these much-discussed colour schemes the better. There has been quite enough said and written about them, so that we could do with a little less of the rattle, and more of the 'osses. If all I hear be true, a colour boom is imminent. Messrs. Lumière are said to have perfected a three-colour bichromate (not gum) process, and the results are very highly spoken of. I am told, too, that something remarkable in the way of printing machinery giving a hitherto unattainable degree of accurate registration is likely to be introduced. Put your money on colour, would seem to be the word for those who have faith in the future of trichromatic printing.

How heavily the photographic paper trust in America presses on the manufacturers of sensitive printing surfaces may be realised by the following extract from a letter which I have just received from the head of a well-known house in the States: "Except we can get the stock of the other paper-makers outside the combination after our stock is exhausted, we shall have to shut down and be stamped out of existence." As my friend says, the American manufacturers are worse off than the English makers of P.O.P., who are not menaced by a paper monopoly, but by the lesser evil of a rise in prices. Fortunately trusts do not flourish on English soil, and the policy of forcing up prices has over and over again been proved to be one of doubtful wisdom.

The subject of illicit commissions, or, as it is more popularly put, bribery in business, has lately engaged the attention of a Special Committee of the London Chamber of Commerce, and the revelations that were made as to the great extent in which palm oil is used in procuring orders for goods from managers and subordinates is enough to make the hair of every head of a trading firm stand up straight. The evidence given before the Committee, and the latter's findings, point to the conclusion that the entire commercial world is honeycombed with this form of dishonesty. I do not see photography named in any of the published accounts of the Committee's report; but some years ago it was notorious that dry-plate makers were very often at the mercy of dishonest operators. It is so easy to fog plates, or not to fog them, that the choice of a brand of plates could, without difficulty, be made to hinge upon the amount of the *douceur* a dry-plate maker might be willing to present to the operator. With the growth of competition, and the erection of dry-plate making into a great industry, the evil state of things I am alluding to has died out, but my readers can take it from me that it once existed in a very acute form.

I can endorse what was said on p. 121 relative to the interesting character of the lectures recently delivered at the Camera Club. The Hon. Secretary, Mr. Godfrey, cannot be too highly praised for the skilful manner in which he caters for the variegated tastes of a "half scientific, half artistic" body, with a membership of between seven and eight hundred. The Camera Club, in fact, to judge by external appearances, is slowly but surely climbing up the hill of prosperity, and it is to be hoped that there will be no break in the continuity of the present admirable system of management. The fact that consideration is being given to the question of obtaining larger premises for the Club is a very favourable sign. It points to the supposition that those at the head of affairs have faith in the Club's future as a social and photographic force.

To me the chief charm of the Club lies in the fact that it is a harbour of refuge from the petty but irritating little storms and controversies that are continually agitating what it is customary to term the photographic world. Camera Club members do not allow the "sustained splendour of their stately lives," as the Beaconsfieldian phrase runs, to be interrupted by haggle and clamour over such awe-inspiring topics as Affiliations, Yorkshire Unions, Professional photography and the Royal Photographic Society, the Royal Photographic Society's Exhibition, the Salon, and so forth; and at the meetings you do not hear the same people saying the same things on the same subjects week after week, year in year out, as at some other societies connected with photography which I could name. In short, as a body in which a great deal of good photographic work is done in a quiet and unostentatious way, the Camera Club has wrought out a unique position for itself, and increasing prosperity and success is only its due in right of the very effective manner in which it fills that position—that of the principal social centre for photographers in Great Britain.

The bitter cry of the photographic assistant, who finds it difficult to obtain a situation, is again heard in the land. You cannot help feeling sorry for men who go through the dreary round of answering advertisements only to meet with non-success. It is cold comfort for them to know that there are tens of thousands of men in other walks of life similarly situated, as a study of the daily newspapers' advertisements serves to show. But the great army of unemployed clerks, drapers' assistants, and so forth, have to suffer and be silent; they have no sympathetic journal which allows them to ventilate their grievances against those callous people who advertise under initials and have no eye for photographic genius or talent; for this is what the complaint of the dilemma'd assistants really amounts to.

But are professional photographers so inhuman and callous as these disappointed assistants would have us believe, and are these latter unsuccessful applicants for operators' berths so skilful as they think themselves to be? Alas! Time after time I have been given the opportunity of running over the letters and "specimens" of those who are seeking situations in photographic studios, and, oh, the tragic illiteracy and photographic incapacity and ineptitude which hundreds of these self-styled "first-class" assistants betrayed! Then, as to professional photographers as a class, I know some hundreds of them personally, and better, kinder-hearted employers there could not be. A professional photographer is very much like other business men, he knows good work and good men when he sees them. I am reluctantly obliged to say that these dilemma'd assistants probably owe their present position to the fact that they are not really the clever operators they fancy themselves to be. Talent is by no means a drug in the market. I fear there is no escape from the old proposition that good men will always get to the front, and that the only way for these assistants to escape from their dilemma is by persistent hard work and study, with the ultimate end of making themselves *masters* of photography. The consciousness of ability carries with it confidence in being able to demand adequate monetary recognition of it.



Those who expected that, as a result of the agitation which has been going on for the last six months for an alteration in the scope of the Royal Photographic Society's annual Exhibition, next autumn's display would present a material difference to its predecessors will be disappointed. That Exhibition will be run on the usual lines, and a minuter classification of the photographs, which many have advocated, will not be attempted. No special class will be created for the "usual thing" or the "show-case" photograph, as commercial work is variously termed, and the pining professional who cannot get his every-day work accepted and hung will be left pining. There is talk of securing the New Gallery for next year; that fine suite of rooms would give every opportunity for an exhibition in compartments, if it is found desirable to make any change in that direction. Probably by that time the agitation to which I have referred will have died out. In the mean time it may be worth while repeating that in the Society's new premises the large room could be well utilised for small exhibitions, one-man shows, and so forth, so that those who are shut out of Pall Mall may yet find the chance of having their work brought before the public, and the complaint that professionals not in the forefront of the movement get no opportunity given them of having their productions hung will thus be removed. COSMOS.

#### LENS-TESTING.

ABOUT two years ago, Herr W. Zschokke, at Messrs. C. A. Steinbille & Sons, published the details of a system of lens testing, which gives the principal qualities of a photographic lens at a single exposure. The test object is an evenly illuminated white surface with a system of co-ordinates, zero being at the height of the lens; parallel to the axis fine lines are drawn at intervals of 20 mm., and each space of 10 cm. is numbered on both axes. A studio camera is used the screen of which is set at an angle of 75° instead of normally to the optical axis, and at such a distance that the image obtained is one tenth of the original size. The optical axis is perpendicular to the object and the lens is sharply focussed at o. The necessary inclination is given to the screen by rotation upon a vertical axis. The plate being exposed in this position, the image formed of fine lines will serve as a measure of the difference between the visual and chemical foci, astigmatism and curvature of the field. The distance of the screen from the test object will give the focus.

Herr W. Zschokke, in the current number of the *Photographische Correspondenz*, mentions that, in using the system at their works, they have made the following improvements. These do not affect the principle, but add to the accuracy of the results. The exactness of the method depends upon the correct determination of the optical axis in relation to the object and screen, and means must therefore be adopted to eliminate errors in the construction of the camera. A circle, 5 mm. in diameter, is drawn upon the test chart at zero, and a metal ball of the same diameter, is suspended from a bracket in front of the circle at the same height. The ball may be moved vertically or laterally, and is adjusted to cover the circle exactly. A telescope, with cross lines at the eyepiece, is screwed on to the camera in the lens flange, and, by means of screws, the camera is so adjusted that the circle, bullet, and cross lines exactly cover each other. The telescope is then replaced by the lens. As the camera screen is movable in both directions without disturbing the baseboard, it may be adjusted at an angle of 75° with the optical axis, as well as vertically, and this should be done with great accuracy. With the original test chart, if the astigmatic difference in one lens equalled the curvature of field in another, under a given angle, it would be impossible to decide which of the two gave better definition.

A similar difficulty could arise as to definition at the centre. This difficulty is eliminated by drawing, parallel to the axis of the abscissæ, about 20 lines  $\frac{1}{2}$  mm. broad and  $\frac{1}{2}$  mm. apart. Adjacent to these, two other sets are drawn, which are respectively  $\frac{1}{4}$  and 1 mm. broad, with corresponding spaces. Along the axis of the ordinates similar sets of lines are drawn horizontally and vertically. If the lens gave absolute definition with tenfold reduction, these lines would measure  $\frac{1}{20}$ ,  $\frac{1}{40}$ , and  $\frac{1}{80}$  mm. in breadth; but, as this is not the case, we may say, according to the distinctness of the lines, that the definition of the lens is  $\frac{1}{20}$ ,  $\frac{1}{40}$ , or  $\frac{1}{80}$  mm., as may be. The whole of the results obtained by this system may be expressed numerically or graphically.

#### OVERHAULING APPARATUS.

THE time is now arriving when photographic apparatus that has lain dormant during the winter months will be unearthed, with the object of again being taken into use. Much of it, unless more care has been bestowed on its storage than is often the case, will be found in a different condition from what it was when put away. If, for example, the apparatus has been kept in a damp attic, the probability is that the shutters of the dark slides and other sliding woodwork will not be found to work freely. When that is the case, force is often employed and the aid of glass paper invoked to ease the parts. That is a mistake. Force will often start the joints, and glass paper will make the parts work too freely when the wood acquires its normal condition. What should be done is to put the apparatus, untouched, in a tolerably dry place—such as an ordinary living room—for a few days. In that time it will, doubtless, have recovered its original condition. If heat were applied to hasten the drying, the probability is that the wood would "cast," or warp; then still more serious trouble would ensue. Sometimes the bellows of cameras which have been tightly packed will stick if they have been put away for long in a damp place. In that case the bellows should be carefully distended and allowed to remain undisturbed in a dry place for some days. If, after that, the varnish on the leather seems tacky, which is sometimes the case, it should be well rubbed over with French chalk. If the things have been stored in an unusually damp place, it is possible that the glue will be seen exuding from the joints. This is a more serious matter still, and the only remedy then is to put the apparatus in a situation where it may dry still more slowly. Then, as the wood shrinks, the glue may go back again into the joints, but, in any case, it should not be scraped off till all is absolutely dry. Although apparatus may suffer by storage in damp places, much may be done in the way of ameliorating the damage by careful treatment when the injury is first discovered.

#### PHOTOGRAPHY IN RELATION TO ART.

DOES photography bear any relation to Art at all? asks Mr. A. W. Goodman in the *Windmill* for January. This is a much-vexed question, as old certainly as the invention of photography, and one that always has been, and probably always will be, answered by different individuals in different ways. That it is scientific in origin cannot be gainsaid; that it is largely mechanical in working is also true. But, none the less, it is increasingly the handmaid of Art, and is often conspicuously used by those artists who are the foremost in denying it any artistic possibilities whatever. What, then, is its real place, if any, in the domain of Art? Is it to be eternally a hewer of wood and a drawer of water to its more fortunate sisters, who are admittedly comprised in the fine arts? Is it destined for all time to be a sort of Cinderella to the painter, to the etcher, to the worker—whoever he may be—who depends solely upon the cunning of his hand and to the accurate observation of his eye for the effect he wishes to produce? Or, is there potentially a Prince in reserve who will some day fit the glass slipper on the now lonely and despised drudge, and declare that she, too, has a place, and that not a small one, in the polished temple of Art—spelled with a capital A?

These are questions at least worthy of discussion; and, so far as the severer class of critics is concerned, it may very well be that they are either ignorant or oblivious of the vast and rapid strides made by photography during the lifetime of the present generation. Assuredly, the counterfeit presentments of themselves with which our grandparents were content were not "artistic," whatever other qualities they possessed. But, as there was a time when the earth itself was without form and void until the Great Architect of the universe breathed upon it, so there has been a time when every invention or discovery in the whole history of the world has been crude, incomplete, and imperfect, until improved upon by the successive working of master minds. Photography is no exception to the rule. "Art," the poet tells us, "is long, and time is fleeting." The time of photography, however, has been painfully short, when judged in relation to Art, which has practically been co-existent with the existence of man, and we have already travelled far from the stock properties and stiff, ungainly poses of the earlier workers in the field. The thoughtful observer, as he mentally traverses it, may well marvel that so much has been accomplished in the direction of infusing into the dry bones of what was, by origin, a purely mechanical process, something of the flesh and blood of a living Art. Art may not have stooped to photography, but has not photography extended a hand, all too unwillingly clasped, to Art? There is, at least, as much difference between the simpering girl, leaning over a rustic stile, of a bygone generation, and the average platinotype portrait of to-day, as there is between the first form of the velocipede and the latest bicycle, fresh from the Elswick or the Beeston works. And, although some of the difference is, no doubt, due to improved mechanical processes, a great deal more is almost demonstrably due to the general advance in art culture that has



been so notable a feature of the Victorian era. Beyond that, it must be borne in mind that some, at least, of the mysterious processes by which the pursuit of photography is attended are not only artistic in aim and result, but are themselves "Art" pure and simple. Take retouching, for example. The good retoucher is, no doubt, born and not made; but the success of retouching, and with it the success of the finished photograph, depends almost entirely on a nicely balanced perception of light and shade; on a thorough knowledge of the anatomy, at least, of the face, and preferentially of the entire figure; on the value of modifying and softening shadows, or, in short, of generally supplying the deficiencies of Nature with the resources which Art has placed at our disposal.

It is all very well for Othello to say in the play, "Paint me as I am," or for Cromwell to have insisted upon Sir Peter Lely depicting him with all his warts, as he is reported to have done. But these are exceptional demands on the part of exceptional men; and it may be taken for granted that the generality of people do not desire to appear to their friends exactly as they are, but rather as they may be, when seen through the golden telescope of love in a somewhat idealised shape, and with one's little imperfections and blemishes softened and subdued by a kindly Art. Nor is there any impropriety in all this; for, while it is no doubt true that where Nature has been bountiful Art can do comparatively little towards improving it—on the principle of not being able to "refine the lily" or "paint the rose"—in those more common cases where Nature has been niggardly, Art may and can do, legitimately, a very great deal towards redressing the balance. In other words, some of those defects which are exaggerated by the camera can be restored to their proper sense of proportion by the aid of the skilful retoucher. In the nowadays little-read fables of Gay there is a story of an artist who determined to let truth, and truth alone, sway his brush. He must certainly have been a forerunner, if not indeed the originator, of the Realistic school of Art! But mark the sequel. His sitters fell away, until the unhappy but conscientious artist was reduced to penury. He then bethought himself of a new expedient, and, placing in his studio busts of Apollo and Venus, he fashioned all his male sitters after the one and his female after the other. Crowds soon flocked to him again, and brought both fame and fortune in their train. There is no Realistic school in photography; or, if there be one, it is of the minutest proportions, and human nature is still pretty much what it was in Gay's time, and, so long as this is the case, the calling of the retoucher will never be superfluous, but will continue to endow the creations of science with something of the beauty and refinement of Art.

It would, however, be absurd to claim for photography that it is necessarily artistic. That it may become so, however, is scarcely open to serious question. Do you doubt it? Look on this picture and on that. This one is flat, hard, crude, without either tone, distance, or other quality to recommend it; that one, on the contrary, is instinct with life. The component parts bear adequate relation to one another, the point of view is well chosen, and the general effect is soft and pleasing. What makes the difference? Surely it is the artistic feeling behind it—the subtle, undefinable something, call it what you will, that distinguishes between success and failure. That photography has painful limitations must, of course, be allowed, and nowhere is this more apparent than in the treatment of the nude. What, with brush or pencil, is graceful and decorous becomes neither the one nor the other when exposed to the manipulations of the camera. Nor is it possible in the treatment of the half tones to accomplish satisfactory results by means of photography. Your sitter may be represented as either being fair or dark, but can scarcely appear to one's friends, as is perhaps actually the case, with no very decided bias in either direction, but with some features common to both.

But, after all, this is only a small part of the whole, and there are compensating advantages elsewhere in the absence of faulty drawing and defective colouring. The artistic sense to the worker of whatever kind is what refinement is to the natural man. You may be born with it, or, more rarely, you may acquire it by slow and painful process of education; but unless it is there—be it intuitive or acquired—your work will never possess a high quality. "But I don't see so-and-so," said a critic to a well-known painter once. "No, Madam," was the quiet reply, "don't you wish you could?" To him that hath eyes to see, let him see, is the natural correlative of "to him that hath ears to hear, let him hear." An amusing illustration of the dignity of photographic art, in this instance falsely so called, came under the writer's notice once in an obscure village in Norfolk. A peripatetic photographer, with long hair and a blue necktie, and a generally æsthetic appearance, had been taking photographs in the orthodox manner, when "to him entered," as the old playwrights would have said, two rustic damsels anxious to pose. He was not one of your ordinary "artists" to whom nothing is uncommon or unclear, and a few searching inquiries elicited the information that the fair ones expected the process completed at one sitting, and to be able to take the completed work back with them. The offended knight of the camera drew himself up with an injured air. "Do I look like a man," quoth he, "who would take a photograph on glass?" And the would-be sitters retired abashed from the great man's presence.

Now, I mention this incident, because it seems to me to represent a somewhat common confusion of thought. The humble worker is regarded as the offence of all things, to be looked down upon by the pro-

fessional from a more or less giddy height. Shall I be thought unduly daring in at once laying claim for amateur photography not less, but more, artistic quality than the professional? The reader smiles, as he recalls many of the grotesque and hopeless failures of his friends to produce even a decent semblance of his features; but, nevertheless, I am perfectly serious in contending that, the conditions being equal, the despised amateur, who knows his business, will generally produce more artistic work than his patronising brother professional. I am not, of course, referring to the Mendelssohns of the profession, who are pretty much *sui generis*, but to the ordinary average worker. Is it strange that it should be so, when it is borne in mind that what is the hobby of the amateur is the means of living of the professional, and, while the former can pick and choose his models and his landscapes, the latter must perforce take all and sundry that present themselves?

I said just now that artists were indebted to photography. It is only fair, however, to add that photographers are under an even greater obligation to Art. Nor are they slow in acknowledging it. One of the leading photographers in London assured me not long ago that he spent every Sunday morning in an artist's studio, mastering the technique of art, and building up the figure for himself, point by point, so that he might be the better able to invest his work with the artistic quality he felt it otherwise lacked. And is not this receptivity of mind, this readiness to learn from whatever quarter, one at least of the many signs which distinguish the true artist from the false? Apelles himself was not above learning from his cobbler, while he confined himself to the domain of his last; and one of the truest artists, in the largest sense of the term, the late Mr. John Addington Symonds, himself told me the following story, which, I believe, has not previously appeared in print. The late Master of Balliol, being on a visit to him in his Swiss mountain home, their conversation was on one occasion interrupted by one of those peasants to whom he was always so accessible, and of whose friendship he was justly proud. When the man at length departed Jowett turned to his friend with the playful remark, "I wonder, Symonds, that a man of your cultivation and refinement can find anything to interest you in the conversation of a clodhopper like that!" "Ah, there you are wrong," was the smiling reply; "that man who has just left me is a perfect authority on the subject of horses, and, if I talk to him about these, I learn a great deal of which I was ignorant before."

There spoke the true artist in his readiness to be all things to all men, that he might by all means save some from the merely routine and mechanical, and lift them to the higher plane of those who, having eyes, see not merely "men as trees walking," but with the unclouded vision of a purer and firmer faith.

But to return more strictly to the vexed question before us; it is, no doubt, one in which opinions will always differ. There are those who contend with Mr. Horsley Hinton—himself no mean authority—that "to such an extent may relative tones be wholly altered, and even the delineation of objects modified, that it may justly be said that the photographer's method is only a little less facile than the water colourist's; and lack of artistic instinct and training is more responsible for the usually inartistic results of the photographer than the inadaptability of the process."

Others will continue to say "non content" to any demand for artistic recognition on the part of photography, and between the two extremes, perhaps, there will be some who will be disposed to say with Ovid, "*Medio tutissimus ibis*."

#### FLOWER PHOTOGRAPHY IN A GARDEN.\*

Judging from the number of articles on the subject which have appeared in the papers lately, there seems to be quite a boom on in flower photography. Fashions come and go in such work as in other things; the success of one leads others in the same path, and hosts of imitators follow. We have had, and still have, sunsets innumerable, mists and marshes, more recently birches, brackens, and flowers. Perhaps we are on the high road to a more cheerful outlook, when exhibition walls will not for ever frown upon us with representations of gloomy dawns, fading light, and lurid skies. May it not be that we have come through the darkness of night, through the sombre woods, and are greeted by the flowers of a brighter country beyond?

Sunshine and flowers are all too rare in this grey land of ours during many months of the year. Should we not recall them to our minds more than we do?

Perhaps the hot summer and autumn of 1898 may have had something to do with the awakened interest in flower photography. The beautiful clear light of many lovely days tempted the ardent worker to sally forth in search of the subjects which he felt must be lying ready to hand at every turn of the way. But the heat of a pitiless sun soon drove him homewards again to find rest and coolness in a shady garden, and there he came upon a bevy of old friends waiting to greet him. Roses, lilies, anemones, and hosts of others crowded round him. He had only to choose, and, having once begun this fascinating study, and found how

\* Paper by Miss Christian H. Curle, to which the silver medal of the Edinburgh Photographic Society was recently awarded.



admirably it was suited to while away a long summer's afternoon and leave a sense of good work done, he was not likely to relinquish it all at once. From the point of view of a lady photographer anything that can be experimented on near home is of immense advantage in summer no less than in winter. A camera of any size is a fairly weighty burden, so are the necessary dark slides. Skirts, however "sensible," require to be held up now and then, and the small hat which goes comfortably under a black cloth does not, without the help of a parasol, keep off the sun; so that, to be properly equipped for an expedition, quite two, if not three, pairs of hands are necessary. It must be admitted that good-natured friends can often be induced to help, but on a drowsy afternoon they are perhaps more inclined to slumber under a shady tree and offer such a suggestion as "Why not try a group of us all here if you want to photograph something?" Where, then, could pleasanter work be found than in a garden?

Perhaps some recent competitions in the gardening magazines may have helped to stir up an interest in this branch of photography, but I am inclined to give a full share of praise or blame to the heat of last summer.

I advocate working in a garden, for I think that is much to be preferred to bringing flowers indoors. There, unless growing in a pot, they must be put in water, otherwise they soon droop and flag, and the handling they must undergo in being arranged does not help matters. When in a vase, a stem cannot always retain its natural curves, while a group of flowers becomes a bunch of which one has lost the individuality, if it may be called so, that it had when growing. The difference between a plot of snowdrops in the garden and the same flowers when cut and put in water illustrates what I mean. A blossom or spray taken as it grows is much more likely to look graceful and natural than when arranged, however carefully, in a vase. Undoubtedly, an interesting field lies open to any photographer who has a love of flowers and takes a real interest in their variety and habits. By studying these in a garden a series of photographs might be gathered forming a most interesting record of the year. Any flowers that have grown to great perfection, those rarely met with, old-fashioned favourites in danger of being forgotten, or those successfully bloomed for the first time, should be carefully selected and included; and the result might easily be that, while the whole formed a collection interesting and perhaps valuable to a botanist, each study by itself would be an artistic picture.

Now is a particularly favourable time for such a project. Gardens and the plants in them are allowed to be more natural than a few years ago; ribbon borders have given place to herbaceous borders, and everywhere more freedom of growth is encouraged. The style of flower in favour has changed to suit these altered conditions. For instance, the stiff formality of the dahlia of other days has given place to a looser, freer, more graceful form of flower. Single roses have crept in where once only the most perfect double forms were considered worth looking at; the much-loved camellia has lost much of its old popularity, and in other families the tendency is the same. The favourite flowers are no longer those which remind us of the bouquets our grandmothers so patiently modelled in wax. An ideal garden of to-day is a charming medley of plants, old and new, growing as much as can be permitted without restraint—creeping, climbing, festooning where they will, carpeting the ground and covering the trellises with rich, tender colour, filling the air with delicious scents. It is not quite the garden of Bicon's dreams. True, we cherish the "stately hedges" if fortunate enough to possess them, but they have no "little turrets" to hold "cages of birds," and, happily for the photographer, no "broad plates of round, coloured glass gilt" for the sun to play on.

What a vision of distracting high lights! One great advantage of working out of doors is that the brilliant light permeating the petals of flowers helps to show their delicate transparency, and in many cases to give truer colour values than could be looked for indoors. Of course there are difficulties too. The chosen flower or spray does not always grow at exactly the right height for the camera, nor catch the light at a good angle. Shadows of leaves may fall upon it, or it may sway beneath the weight of numerous energetic bees, whose well-known habits of industry apparently make it impossible for them all to stay still a single instant. Some flowers they persistently haunt, such as the Erigeron or sea holly. Tempted by the beautiful silver greys and blues of this handsome plant, I tried one day to photograph a branch of it. But no less than nine bees were there before me, and, though they might have helped to make an interesting picture had they been still, the constant movement of some of them kept the plant trembling and quivering so that an exposure of proper length was impossible. The question of suitable elevation has also to be considered out of doors, flowers which grow low down on the ground being much the most troublesome to manage. No amount of careful arranging will make a group of, say, giant colchiums (autumn crocuses) look natural when out and brought into the house. A typical group of them must show the large stately flowers at every stage of their growth, for so they are usually seen in the border when at their best. The full-blown ones, opening wide to the sun, show the beautiful striped veining of their petals; the half-grown, of a deeper shade of mauve, still partly closed; and, lastly, the round fat buds pushing their way like mushrooms through the soil. Together they make a beautiful group; but to reach them the camera must be brought as low as

possible—so low that careful focussing becomes extremely difficult, and the poor photographer is obliged to lie almost full length on the ground to see the ground glass at all. In this trying and back-breaking position he is apt to overlook the fact that the camera has included one of its own legs in a curious distorted fashion in the picture.

Snowdrops present the same difficulties, but they can often be found growing more or less wild on the steep bank of a glen, and then can be got at very easily. In this case they often have a beautiful natural background of dark green wood ivy to show up the purity of the dainty blossoms. When a flower grows too high up, and it is not possible to raise the camera sufficiently to be on a level with it, I have found the best plan to be to cut the spray with as long a stem as possible, and tie it to some support which brings it to the proper height. Pea-sticks may be found most useful for this. The length of stem cut admits of the flower retaining its natural pose, and also allows the buds, thorns, leaves, &c., to be clearly seen. Sometimes a little judicious thinning of the leaves is advisable. A piece of yellowish-brown pasteboard, such as is used for packing books, makes an admirable background, and, if there is any difficulty about propping it against another pea-stick, it can easily be held in the hand while the plate is exposed. No amount of movement matters as long as the pasteboard is large enough and does not touch the flowers to shake them. A lighter or darker background can be had according to the distance it is placed behind the subject. When very near, it will in most cases be darker, and care must be taken that the shadows cast on it are not too distracting. If soft and slightly confused, they may add greatly to the beauty of the picture.

An ideal place for flower photography is a trellis covered with flowering creepers. Then there is a great choice of beautiful blossoms, sprays, and branches, and the background is easily arranged behind them. Nothing more delightful could be found than a group of some of the single roses which have come into favour the last few years, such as the Penzance briars, Macartney roses, Paul's Pillar whites and carmines, and many others. They are most graceful and decorative in their growth, a thousand times more so than the full, well-formed double roses which are the gardener's delight. A charming study can be made of the flowers of such a rose—a bud, perhaps, or a seed-vessel or two, with a few grey-green leaves, and some of the stem showing to give as much as possible the character of the plant. The background should be used here, for, though a thick screen of green looks well enough on the ground glass, it may be very spotty when reproduced in black-and-white. Brown paper does very well if the pasteboard is too heavy, but it must be free from creases. The best effect is generally secured when the light falls on the flowers from the side, and in most cases bright sunlight is not advisable. The very deep shadows thrown by it rather hide the true form and delicate roundness of the blossoms, and the faint half-shades may be lost, while the high lights tend to become too dense. This, however, can hardly be laid down as a rule, for plants differ so much in habit and colouring that each must be studied and taken in the way that suits it specially. Speaking generally, the flowers that can be most successfully photographed are those of a pale colour, and not too solid a growth. The blossoms of apple, cherry, and peach fulfil these conditions, and at the same time grow in most beautiful sprays. Almost any one taken at random makes a picture of itself. Single roses, Japanese anemones, irises, the common pink and white mallows, and many others make charming subjects for the camera. One and all, they look their best life size. Working with a half-plate camera, a good deal of selection is required to find just what will suit the proportions of the plate and fit into it.

In making a study which is to be of botanical interest, care should be taken to show any special characteristics of the plant. Whatever helps to recall the living, growing plant to the mind adds an additional value to the picture. Sometimes the backs of the leaves are very distinctly veined, as in the Japanese rose, *Rosa rugosa*; they are more grey in colour than the other side, and the veins stand out very prominently. These catch the light prettily, and it is not difficult to show the texture of the leaf. The same rose has very large handsome hips, which should not be forgotten.

The seed-vessels of many plants are beautiful and distinctive; none more so than those of the physalis or winter cherry, some irises, honesty, or the pods of the common broom, which are of a dark grey-brown colour, covered with fine downy hairs.

So far, only flowers or sprays have been under consideration, but a whole plant may make a very striking picture, such as a well-grown bush of spirea, *Grossularia folia*, all hung over with its drooping bunches of creamy flowers, or the more upright variety, *S. gigantea*, with its tall spikes shooting up boldly from among the leaves. Groups of tall lilies or foxgloves make a delightful study, all the more so that they have a pleasant way of frequently growing in front of dark bushes, which make an excellent background for them. Large poppies of pale shades should be included in our list, but the red ones are disappointing. Here we come face to face with the great weakness in flower photography, the impossibility of reproducing colour. In dealing with flowers which are white or of pale shades it is not felt so much; but, when we come to brilliant scarlets or glowing reds, the wisest thing to do is to pass by on the other side, and regretfully allow that, until we triumphantly arrive at perfected colour photography, one of the greatest beauties of the garden remains unattain-



able by the craftiest camera. In photographing flowers the focussing is not such a simple matter as in landscape work. Everything is at such close quarters that the distortion of parts not in focus becomes very pronounced unless a small stop is used. This necessitates a comparatively long exposure—no easy matter when every petal and leaf, emulating the traditional aspen, quivers with the slightest breath of air. Absolute stillness has to be patiently waited for. The common saying, "Not a breath stirred," infers a state of things seldom met with during the day, especially in a Scotch garden. A certain amount of softness in the definition of parts of a group is often an improvement. What should be aimed at is a picture which will express in some degree the tender delicacy of flower petals and their texture. Roses should not be hard and clear cut as if they were shells or moulded in fine porcelain; nor must they err on the other side and lose all feeling of the cool freshness we associate with the touch of them.

Isochromatic plates are much recommended for flower photography, and for some colours they are indispensable, but my own experience is that any good very quick plate will, as a rule, do excellently for open-air work. The difficulty of getting the flowers absolutely still makes a short exposure imperative, and yet it must be a full one, for a harsh under-exposed negative is hopeless. Therefore I prefer a quick plate.

The developer used should be slightly weaker than for landscape work. It is generally safe to use the one the worker is accustomed to, slightly modified to suit the case.

Development carried too far is a great mistake, particularly with studies of white flowers. What is desirable is a clear, good negative, with plenty of soft detail in it, and no fog. Such a one prints clearly, without losing the delicate half-shades of the flowers. Great care should be taken not to expose the plate to too much light in the dark room; even red light should be sparingly used with the quicker makes.

For studies of flowers there is a large choice in the matter of printing processes. They look well in almost any, particularly so in carbon. They have this advantage, that, as the inversion of the image rarely matters, single transfer suits them as well as the longer process. They tell no such tales as do figure studies. An excellent one of a seamstress, seen lately, represented her as sewing diligently with her left hand.

Platinotype, too, gives very good results, either on rough or smooth paper. I find that the best are got by printing, even in summer, from a negative of average density, in the brightest sunshine available.

In winter a good deal can be done to avoid the dull, muddy look which, in spite of all precautions against damp, will often show itself then, by warming everything used in printing. The negative should be held to the fire for a few minutes, and the printing frame laid inside the fender till thoroughly dry. The bottle containing the developer, its cork loosened or removed, may be placed close to the fire while printing is going on. It will then warm up slowly, and be ready when the prints are to be developed. Those suspected of being under-printed should be done first, as the solution soon cools. If porcelain dishes are used, they, too, should be heated by being filled and refilled with hot water. By taking these precautions good prints may be secured in any weather from a fair negative.

The objectionable muddiness to be guarded against seems to spoil photographs of flowers more than any others, for we trust to their delicate gradations of tone to help us to recall the beautiful tender colouring it is as yet beyond our powers to reproduce.

#### LENSES OLD AND NEW.

BEFORE the London and Provincial Photographic Association, on March 9, Mr. A. T. Harris gave a chat on the subject of "Photographic Lenses." It was notorious, he said, that photographic optics, of all branches of study, was most prolific of discussion, in which fact, when casting about for a subject for his paper, he had decided to find refuge, anticipating that a few well-chosen words would be sufficient, by the lively discussion which must ensue, to make up for any lack of something original in what he had to say. The present was, he thought, an excellent time to ask whether the improved lenses of the present day were really worth the large amount which was asked for them when the work of these and the older and cheaper lenses was compared? For himself, he believed that, for many classes of work, the cheaper French and English lenses were excellent instruments, although admittedly not equal to certain exacting conditions. His remarks, however, were directed more towards the amateur, who might be tempted to believe that the newer lenses were absolute essentials to his outfit for what was only work of a general character. To take the statement of claims, as given by lens-makers in their price-lists, there was the inevitable item about the large working aperture of "this, the best lens made," covering such-and-such a plate to the edges at a given aperture. In mentioning these, he did not infer but that it was absolutely correct, but he did wish to discuss whether these advantages were necessities, and whether, taken from the point of view of the general amateur, who has perforce to look at his money before parting with it, any such superiority justified his expenditure of the larger amount. Could it be said, the lecturer inquired, that this large aperture, of which so much was made, was required? In special

cases, yes; but in general cases he thought not. Take the field days of photographic societies as an example. While yet talking about the large working aperture of their lenses, they disregard it altogether in practice. The object of the large aperture is the possibility afforded for rapidity of exposure; but, at the same time, other conditions tend so much to the same end that, for the majority of general work, the smaller stop of the cheaper lens answers all requirements. Another quality urged on behalf of the newer lens was flatness of field. Here, again, in everything but critical work a lens of some curvature of field was rather to be desired, and the same might be said of other excellent qualities claimed for the new lenses, which in every-day practice are rarely brought into requisition. Mr. Harris was recently looking around the walls of the South London Photographic Society's Exhibition, and wondered how many of its pictures were the result of the valuable lens, and how many were secured only by the facilities afforded by the large apertures they allowed. In many cases he found that they were taken with a landscape lens, and, further, that the man who had the valuable instrument has simply stopped it down; and the general opinion was that it was no matter whether it was a valuable lens or not. He considered all this as good argument, as exhibitions must be admitted to attract the best work; the standards of excellence, as it were, were found on exhibition walls. Why, then, if this be so, are these valuable lenses so necessary?

At the conclusion of his remarks a selection of lantern slides was shown with a view to comparing the work of different lenses at their various apertures.

Mr. P. Everitt thought that Mr. Harris's remarks could not fail to appeal to the amateur, and agreed that, for ordinary amateur work and exhibition work of the present pattern, there was no vital necessity for the more expensive kinds of lenses. Indeed, one could obtain results which were quite satisfactory from the pictorial point of view, with a plain spectacle lens, observing the necessary precautions. A sharp picture of considerable angle was possible by stopping down the lens, one that might even be enlarged. A spectacle lens might also be arranged to give the best definition centered on one thing with the rest in diffusion. Such a lens, then, from its price and the many inherent good qualities it possessed, might be taken as perhaps one of the best an amateur could have; but for professional or special work, subjects which were exacting in their conditions, the spectacle lens would break down, and one must perforce have recourse to the more expensive class of instrument. He offered it as sound advice to the professional that he would be wise to possess himself of the best lens he could get. With the largest aperture one could yet get the finest definition with perfect freedom from astigmatism at the same time, and there was a lens on the market at the present time which would fulfil all these conditions. He had shown that it was possible to get a picture of a fast-galloping horse in one five-hundredth of a second, in which even the hair of the animal was defined, proving that with the more expensive lenses one could obtain results which the ordinary rapid rectilinear would not touch. Of course, in comparing the work of the two classes of lenses, it was only right to choose a subject which would call forth the best powers of the lenses employed. However, unless the amateur had the intention of taking interiors, copying, or other critical work, and had to study his pocket, he would say, Do not go in for the expensive lens.

Mr. J. E. Hodd agreed with the lecturer in the main. The extra expense of the best lens was not justified for ordinary work, and the R.R. would embody everything ordinarily required.

Mr. B. Child Bayley so far differed from the reader of the paper as to believe that the new lens, under most circumstances, possessed distinct advantages, excepting, perhaps, for gum-bichromate workers on cocoanut matting. For landscape work he liked to have the best possible lens obtainable. The command over exposure they afforded was sufficient to debar him from the use of anything else. The difference between a really good anastigmat and a rapid rectilinear in this respect was hardly to be realised without experiment, and the power of using for hand-camera work an ordinary plate was an advantage of no mean proportions. He believed that where many people went wrong with these fine lenses was in their ignorance of how to focus. They forget that they are using an instrument of precision, and so often do not get the utmost from the lens. He should plump for the expensive lens; the results were as good, and generally better, than those of older lenses, and, moreover, when selling they fetch a good price.

Mr. Everitt instanced a judgment passed upon a lens by its visual accomplishments alone, and said that one should never estimate by the ground-glass image, especially with the modern anastigmats, the photographic results of which were far better than the visual results.

Mr. H. C. Rapson also testified to the greater fineness of definition of the anastigmats. The finest ground-glass screen he could obtain was too rough until it received a coat of varnish. Another argument in its favour was that great speed of plate was less important, as these lenses with a large aperture gave as good quality as the small aperture of the older lenses with a faster plate, and everybody would concede the advantages held by a slow over a fast plate. Among other advantages mentioned, there was that of convertibility. A half-plate lens could be used as a wide angle on a 12×10, and, stopped down, give very good definition.



Mr. S. H. Fry believed that the amateur was credited with attempting the most difficult feats, and, if for that reason alone, he should have the best of tools, something better than the present-day instrument, rather than a cheap and inferior article.

The discussion was both long and full of interesting points, in addition to the above, the Chairman, Mr. Teape, and Mr. Haddon joining, and in reply Mr. Harris laid stress on the fact that, he was addressing himself particularly to the ordinary amateur, and recapitulated and confirmed the arguments he submitted in his paper.

### PHOTOGRAPHIC MENTORS.

AFTER a long experience of the numerous emulsion formulæ published in the various photographic works and journals, it has occurred to me that the authors of those formulæ can seldom, if ever, try them before publishing them, or the grave errors we find in them would never occur; for, after testing a very large number of those published, I have been unable to find a thoroughly satisfactory and workable one. Probably these failures will be put down to my carelessness and stupidity; possibly it is so, but I am not alone in this respect, and my information says that any one, even without any knowledge of chemistry, can make them.

In gelatine emulsions we find the silver varying from twenty-two and a half grains to the ounce to about seven, and the author of the latter says he sometimes adds *more* water; another advocates alum, and gives such a quantity that a moderately hard gelatine is turned into an insoluble lump; no mention is made of what brand gelatine to use, or, if so, it is often an unsuitable one; the directions in one formula say, "When the gelatine emulsion is mixed, it should be stood upon the kitchen hob, and shaken at intervals during the day"—rather a good (?) thing for the gelatine, and, should it be forgotten, which is very probable, I wonder what the emulsion would be like. In one the silver *must* be added first, in the next it *must* be added last, and the glorious diversity of opinion certainly gives us an "infinite variety," which, if not exactly "charming," prevents emulsion-making from becoming monotonous.

In collodion emulsions we find the haloid and other salts are to be dissolved in an amount of alcohol which will only dissolve about half the amount given unless the alcohol is of the weakest; in another, it is advised to add albumen with the only result of coagulating the albumen; in yet another, the haloid salt is in such quantity that a dense precipitate is formed, no matter how carefully mixed; in one, the organic acid and haloid salt are so unsuited to each other that a heavy white precipitate falls when they are mixed, making the emulsion grainy, which some writers say does not matter much, though personally I have found that a grainy emulsion leaves little nodules and lumps in plates or papers. Glycerine and castor oil are advised to be added to collodion in enormous quantities, making the collodion rotten and useless; one emulsion is advised to be washed, another is left unwashed, one is said to keep well, another will hardly keep at all—not a very good recommendation to start with. Collodio-chloride is said to be best coated upon arrowroot-sized paper, for gelatino-chloride almost any pure paper will do; one says it is quite easy to coat collodion emulsions by hand, but more difficult with gelatine, the next says it is quite easy with gelatine, but more difficult with collodion; this may seem a little puzzling to the average reader, but our mentors evidently do not think so.

The novice is advised to "step in where angels fear to tread," as no knowledge of chemistry is required. When it comes to the coating of plates and papers, our photographic mentors are in their element; plates are quite easy to coat, papers are a little more difficult, but the difficulties can be easily overcome. What a glorious outlook for the amateur with limited purse, who finds his plates and papers a serious financial item. Why should he buy these articles when he has all this useful information, and can so easily make them himself? I can imagine the novice starting with no knowledge of chemistry, ditto of fluid measure, ditto of the metric weights and measures, fluid or otherwise, and possibly a faint knowledge of Apothecaries' weight (the most generally used English chemical weight) learnt at school and mostly forgotten. We will suppose our amateur starts upon a chloride emulsion first, as it is easier than bromide. Assuming that he has managed to get a fairly workable formula in collodion, and can make an emulsion fairly well, he wants to coat paper with it, the first question is, "What kind of paper shall he use, and where shall he get it?" His mentors say arrowroot paper is best, but do not say where it is to be obtained. I am afraid he will experience considerable difficulty in getting it, and, should he be successful, the price will be prohibitive, and, what is more, he will find, when he has coated it, that the paper has a "messy" sunken-in appearance, and the chance of getting a decent print off it is very remote; perhaps he tries to get the baryta paper, as generally used by the manufacturers of these papers, and, unless he happens to know any one in the trade, his chance of getting that is anything but rosy; but, even should he be fortunate enough to do so, he will probably find it quite as dear as the ready-sensitised printing-out paper.

Perhaps he next tries a gelatino-bromide emulsion, and, again, to read these articles, one would think it quite an easy matter, and the lot of

manufacturers of chloride and bromide emulsions a life of "beer and skittles;" but, when we find clever chemists saying that the manufacture of rapid bromide emulsion is one of the most delicate operations in chemistry, we begin to think that perhaps after all there may be some difficulties attached to it, which are greatly accentuated by the fact that very rapid emulsions must be made in almost absolute darkness, and the operator must trust more to memory and touch than sight, and very little idea of the result can be obtained until the plates or paper are coated. It would be rather interesting to see some of the authors of these formulæ at work upon rapid emulsions, and more interesting to see what the result of that work was, also to know if they find it quite so easy as it appears from their writings to be; and, if so, what a grand opportunity for some of the manufacturers if they could secure the services of these gentlemen.

Photographers reading these articles will naturally think that the only reason manufacturers erect elaborate and expensive machinery is, so that they can turn the materials out cheaply. Undoubtedly this is partly the case, at any rate, but, up to now, my experiments with paper have only convinced me that nearly all the ideas for coating paper suggested in these articles are useless, and it is only by using elaborate and expensive machinery that paper which is to be of any use can be turned out at all, quite apart from the question of economy.

Let us presume we are going to make a collodio-chloride or collodio-bromide emulsion. When we have made the emulsion, it is to be poured over plates or paper until they are covered, and the superfluous emulsion is to be drained back into the vessel. This is all right in its way, but where is the ether going to in the process? I have generally found that, by the time the second or third plate or piece of paper is coated, the emulsion is too thick to be of any use, besides which, in the case of paper more particularly, at the corner where the emulsion is poured off, the film is much thicker than elsewhere. I am aware that this kind of coating is done in wet-plate photography, but the plain salted collodion used in that process is very much thinner than an emulsion can be made to be of any use. This operation is fairly easy for paper (after some practice) with collodion where the solvents of the collodion have little or no effect upon the paper; but, when it comes to coating paper with a gelatine emulsion, troubles begin, for, unless the paper is held firmly down in some way, directly the emulsion is poured on, it begins to cockle, and the emulsion is left in a series of little pools.

Sometimes we are recommended to lay the paper upon the emulsion in a flat dish, after the manner of albumenised paper; this might answer, although I doubt it, as I cannot see how the emulsion can set upon the paper sufficiently quickly to form anything like a coating; but, even supposing it should answer, it is much too wasteful to be serviceable, as there must always be more than sufficient emulsion to well cover the bottom of the dish, and, when it comes to coating sheets 12×10 and upwards, this would mean a loss of several ounces of emulsion. Plates can be coated with gelatine emulsions fairly easy, as, of course, the water in the emulsion has no effect upon the glass support, and, being a flat surface, if care is used, a sufficient thickness of film can be obtained.

Very seldom is any remark made about the effect of the various haloid salts recommended for chloride emulsions, nor is it often stated that every haloid salt of each different metal gives a varying result in tone by some curious, and at present unexplained, reasons.

I have found that every brand of gelatine gives a different result in the tone of papers, and sometimes different batches of the same brand will give a slightly varying tone, but I have never found this mentioned in any work upon the subject or in any formulæ, and I contend that it should be mentioned, as the gelatine exercises a very curious and marked effect upon the printing paper, whether bromide or chloride. Collodion is practically inert, and, should it make any difference in the colour, which is very seldom, the variation is too slight to be appreciated.

I have no wish to discourage any one from experimenting in emulsion work by the above remarks—very much the reverse, as I am sure that every one who takes up photography must largely benefit by a knowledge of the scientific part of the subject, for undoubtedly it will help them out of many difficulties, but I would advise the beginner in the words of the cynic to "believe nothing he hears, and only half of what he sees" in photography, and not to expect that, when he once gets over the difficulty of making an emulsion fairly well, all the rest is plain sailing, or he will turn up experimental photography in disgust, for any one must be prepared for a series of failures at the commencement, however careful he may be, though he should not give up hope of succeeding.

My idea is that for a workable formula in a gelatine emulsion the particular brand of gelatine to be used should be mentioned, together with the temperature at which plates or papers are to be coated. I have seen in some formulæ that the emulsion should be at a temperature of 130° F. for coating, but cannot imagine what sort of film would be obtained, as I do not know any gelatine which requires anything like such a temperature to keep it fluid. In a collodion emulsion the specific gravity of the ether and alcohol should be given, so that there shall be no doubt as to how the collodion will work, and also that the amount of salts mentioned should dissolve in the quantity of alcohol given. Of course, an experienced hand can get over these difficulties easily enough, but these formulæ are supposed to be written for novices, and, although I am afraid that the mere mention of the specific gravity of the ether and



alcohol would be of little use to the average novice, still it is the only standard one can give.

I would advise any one taking up experimental photography to get a knowledge (even if only a slight one) of chemistry if possible before starting, as it will greatly help him in his experiments, for, although we are told that no knowledge of chemistry is required, even a little knowledge is very useful, and helps one over innumerable difficulties, and, as far as my experience goes, if success is looked for, it is absolutely necessary. Any one could perhaps do without this knowledge if the various formulæ could be depended upon, but they cannot, so I advise the novice to be prepared.

I am quite aware that there must always be a certain amount of diversity of opinion about emulsions, as photographers' tastes differ so widely, but there ought not to be the wide divergence in these formulæ, and cannot be if anything satisfactory is to be obtained. A method adopted very largely of late is to make stock solutions of the various ingredients required, and then take so many parts from each; the only reason for this seems to be to make the formula as unintelligible as possible. If the stock solutions were of equal or proportionate strengths, and proportionate parts were taken, one could understand it; but the stock solutions are almost invariably unequal, and the parts to be taken still more so in proportion, so that, should you wish to get some idea of the proportion that one part bears to another, you must be prepared to go into long columns of decimals. There may be a reason for this system of working, and that a utilitarian one, but I candidly confess that I cannot see it, nor have I met any one who can.

It is necessary that these formulæ should be published, and a good thing for photography that they are, as they very often lead up to fresh discoveries, but surely a little more care might be exercised by the authors before publishing them.

The only thoroughly workable formulæ seem to be those in the hands of the manufacturers, and we can quite understand that they are likely to jealously guard these very valuable trade secrets from the most remote chance of discovery, seeing the large expenditure of time, trouble, money, and patience required to bring them to a state of perfection.

C. T. SUTTON.

### THE SCIENCE OF PHOTOGRAPHY.

The science of photography is so common a phrase that we are apt to conclude that the elements of a new science have been constructed. This conclusion rests on but very little solid material, and, what is more, no serious effort to reduce photographic phenomena to a scientific system has yet been made. Year by year investigators are recording experiments, well-established facts accumulate, and our libraries are fast becoming a chaotic mass of isolated items, fragments of researches, difficult of access, and of no utility, serving only as a striking monument of human industry and curiosity.

To this accumulation of material photography must, for some years, be liable, for, unlike the older sciences, it was not preceded in earlier civilisations by a long course of speculative thought, but leaped at a bound into the experimental arena; its theory and first principles were not discussed previous to the existence of the material for testing their validity. Photography has thus passed through no speculative career, and, until it does so, no first principles can be accurately defined, nor can its phenomena be classified and arranged as becomes a true science.

Speculation proceeds by means of hypothesis and theory, these being the silken threads which alone can guide the mind through a maze of data, to allowing a subject to be grasped in all its complications and as an organic whole. Without a bold and sweeping generalisation to support them, the most orderly array of tabulated items must remain meaningless and beyond the powers of the mind to readily command. A clue of this nature is therefore a practical necessity if the results of experiment are to be properly utilised. Some modern men of science do not recognise this need, being dominated by the belief in the all-sufficiency of experiment, and satisfied merely to add fact to fact, looking upon hypothesis and theory as imagination, a pernicious faculty to employ in the domain of science.

To an extent this censure is merited, imagination, if uncontrolled by evidence, forming the most grotesque and extravagant theories. Rightly used, however, it has entered largely into the most brilliant discoveries that modern science has achieved.

These two opposed views of scientific method happen to be well illustrated in the photographic work of Abney on one side and Hurter & Driffield on the other. Abney is content with exact, patient, elaborate tabulation of experiment, showing a studious care not to allow speculation to intrude, leaving the facts to speak for themselves—a fact which they generally fail to perform, because the mind that conceived the experiments alone knows the language by which they can be interpreted. With Hurter & Driffield we have the same careful record of evidence, but with the distinction that each observation falls under some theory or hypothesis, the imagination being freely used to suggest new lines of experiment, connect isolated data, and to find in the hypothesis or theory the law which governs the effects under examination. A study of the labours of these photographic experimentalists is in itself, apart from the information acquired, an education in scientific method.

Although Abney has always mistrusted theory—a mistrust not shared by Robert Hunt, who attempted to associate science with poetry—it can hardly be disputed that a large part of his services to photography are the outcome of an advocacy of the silver sub-bromide theory—a striking example of how fruitful the pursuit of a theory may become. From Abney's attitude towards theory it has resulted that in his own special province he missed several important discoveries which Hurter & Driffield arrived at by a more liberal use of hypothesis. This very power of theorising has been urged as a defect in their labours, yet it is undoubtedly the source of their strength, and by its aid they were enabled to advance the cause of photographic science.

From hypothesis the test of experiment determines a theory, from a tested theory the law of phenomenon emerges. A law so founded would become a first principle of a real science of photography.

By a photographic science is thus meant the laws of photographic phenomena, a notion quite distinct from what is implied in the common phrases "photographic optics" and "photographic chemistry." Optics and chemistry being themselves sciences, there cannot be a "photographic optics" or "photographic chemistry." This confusion in classification has led to the growth of a bad system of giving instruction in photography. At schools it is usual to treat of the optics of photographic lenses and the chemistry of photographic processes as independent sciences, disconnected from general optics and chemistry. Such a system gives rise to the most perverted ideas in the student's mind, preventing a right understanding of the optical and chemical laws under discussion.

Relegating optics and chemistry involved in photographic operations to their logical position, we come to the actual science of photography. This in its simplest form is resolved into actinometry and development; that is, the laws of the formation of primary images by the agency of light on sensitive compounds and the laws of the production from primary images of secondary images by the process of development.

In the first branch we already possess a well-marked principle, which rises to the status of a scientific law, being axiomatic and basic. Yet even this generalisation has never been cast into a form of words commonly accepted. Abney states it as follows: "The effective exposure is proportional to the intensity of the light multiplied by the time of action." Putting this in other words, "Equal amounts of photographic action result when the product of time of acting and intensity of light are equal."

Here it is asserted that under all circumstances, and upon any sensitive surface, an exposure to a given luminosity for ten seconds will be equivalent to one second's exposure to a luminosity ten times as intense, and similarly for all other intensities and times of action. This is a far-reaching statement, and in the main it holds good when brought to the test of experiment. Abney, however, has shown that it is not strictly followed when a series of exposures of less than a second to a strong light are matched against a long exposure to a weaker light; for example, one-tenth of a second at a foot from a candle, and ten seconds at ten feet from the same candle, under such conditions the short exposure giving a deficient density. Apparently here is a breakdown in the general law, though probably it is merely an experimental error inherent in these conditions, the law being obscured by the plate-speed factor.

The laws of photography must always be of this approximate character, but, considering that such an exact science as mathematics suffers like defects, it need cause no alarm. With our science all we can hope to achieve is to formulate its principles as theory, not demanding their strict occurrence in practice, except within given limits from a mean.

The foregoing law may thus be taken as the foundation of exposure, for, if its truth is seriously questioned, it would reduce all photographic action to a state of confusion, introducing disorder into what now appears regular and orderly.

This first axiom establishing the laws of actinometry as at present laid down came to a sudden end, since, amongst all the numerous recorded investigations, no other generalisation has yet been put forward which can be said to rise to the dignity of a first principle, proving how very little we have advanced towards a science of photography, and how boundless is the unexplored region waiting for a really searching intellect to there exercise its powers.

Turning to the second half of our science, we find in the researches of Hurter & Driffield a second generalisation which can be said to possess the features of a scientific law, this being their fundamental theory of constant density ratios, meaning that the ratio of gradation is an attribute of exposure, unalterable by methods or modifications in development. This second law, being a comparatively modern discovery, may in course of time undergo some change; but its essential truth can scarcely be disputed. The law once grasped, it is immediately seen how greatly it disturbs older notions, since it follows, as a consequence, that exposure, and not development, is the chief controlling element in the production of what is called a correct negative.

Briefly put, the law asserts that secondary or developed images are proportional to primary or latent images, an assertion that seems entirely reasonable and in accord with observed facts.

With this law, as with all laws, by imposing abnormal conditions, variations that appear to contradict its accuracy can be produced; in



reality these variations being simply fluctuations on either side of a mean. Once accept the law of constant density ratios, and these same fluctuations are brought under the rule of law, and their limits determined, whilst, on the contrary assumption of movable density ratios, they still remain without rational cause.

Comparing the two laws above enunciated, it is at once apparent how well they agree, both between themselves, and with the wider laws which govern matter and energy, under all its forms. Suppose them different, and we shall have to account for a surplus of energy created from nothing; as they stand, they are in entire agreement with the universal principle of the conservation of energy, since they assume that the final effect is no greater than the initial cause.

The effects of a one candle-metre second of energy remain a one candle-metre second throughout, being always one-tenth less than a ten candle-metre second of energy; in no event does the former become half or one and a half, and the latter eight, fifteen, or twenty candle-metre seconds in effect.

The mutual support thus traced gives an insight into what a science of photography might become, and is evidence that its phenomena follow regular laws that admit of classification and systematic arrangement.

A third principle which must become an axiom in photography is the law of the energy of a developer, and this generalisation will probably be the next step in advance, because, with the multiplication of developing agents, the practical man is thrusting a demand for such a principle to the front. It is, in fact, an urgent need in order to simplify the daily routine of the dark room.

The above three laws are all that remain out of thirty-six propositions written down several years ago as possible axioms. Month by month first one and then another has been slain without hesitation; the survivors are few, but, cut and thrust as I may, they remain alive with a persistency that argues the possession of the vital spark of truth.

JOHN A. RANDALL.

### THE CHEMIST AS PHOTOGRAPHIC DEALER.

BY A CHEMIST.

THE chemist finds the profits in many once highly remunerative directions becoming less and less. Patent medicines, toilet requisites, and so on—once well worth attention—have, from a variety of causes, slipped in a great measure out of his hands, or, what comes to much the same thing, they have been grasped at by so many competitive other hands as to make their selling a very different thing to what it once was. Even in his more special field, grocers sell drugs, drapers scents, and stores dispense prescriptions, at far less comforting prices than he had got to regard as legitimately and particularly his. The natural result is, that he has to turn to fresh directions in the effort of replacing vanished, or supplementing vanishing, profits in the more orthodox grooves. One of these new departures is dealing in photographic articles. Now, on the face of it, the chemist should make a very suitable man at this; his shop is admirably suited to the storage and display of photographic goods, he is himself accustomed to handle delicate and fragile articles, and his familiarity with the weighing of chemicals, and turning them into solutions of definite strengths, to say nothing of the closer knowledge he would have of the properties of active ingredients, ought to stand him in good stead when similarly applied in what pertains to photography. Again, the optical knowledge, and mechanical aptitude necessary, one would naturally expect to be present, or readily acquired at need, from his general scientific training. But theoretical probabilities, from some reason or other, are apt to break down when it comes to practice. Clergymen's sons are rarely held up as shining examples, stockbrokers conclude important money dealings with lead-pencil scribbles in small note books, doctors are careless liveries, madmen less dangerous with unlocked than locked doors, and, finally, to our particular point, chemists do not make good photographic dealers.

Speaking broadly, the whole traditions of a chemist's trade go against the accepted formula for success, if by that be meant a banker's balance on the right side, as understood nowadays. The leading businesses of to-day owe their position to the consistent application of the rule of small profits and large returns; the chemist, on the other hand, has been trained to believe in large profits and small returns. This anomalous position is mainly due to the mixture of profession and trade in his work. Where an element of the former enters, such as in the special knowledge needed and care exercised in the proper mixing of various strong items in a medicine, he is certainly entitled like any other professional man to rank, pay, and profit on the higher professional scale; where this is not needed, he is tradesman pure and simple. As he has, however, much about the same make up in the way of human nature as any other man, it is very natural that the professional wing should be extended to cover as much as possible, and high charges shelter under its shadow when they should not. Applying this in the photographic direction, the chemist is not genially prepared like his more up-to-date competitor to sell with a low enough margin of profit; a camera is held to have something of additional value if figuring for sale in his shop, and far too much is charged for the necessary chemicals. The result is that he suffers, now that people have found out that there is no particular "divinity hedging in"

his shop, excepting only in the sale of poisons. A good deal of grievance and friction there is in this poisons question; but it is one that could very easily be settled by the exercise of a little common sense even under the existing order of things. Were the chemist wise in his generation, he would certainly, with this trump card of being the exclusive legal seller of poisons, in hand, not act as he generally does in charging top prices for what can only be obtained from him, but reduce them to the lowest possible figure, and take full advantage of the very material gain of having once got a customer into the shop, in introducing other and ampler business; but at fair trade prices, and not bastard professional ones, for, apart from all other considerations, it is useless standing out for the latter against the general cheapening tendency of an educated age. The same reasonable holding to a low profit ought also to give him an advantage in putting up the various solutions for amateurs; but even the amateur is not going to recognise any particular claim for doing so, beyond a fair profit upon the ingredients and bottle, and a slight charge for the trouble. In plain English he must shed the idea that a special training in one direction makes him superior to his fellows when off his own ground. It is rather unfortunate that the slightness of that training goes rather against doing this readily, begetting instead a tendency towards quackish pretension. Must it not be admitted that the gravity of his demeanour, together with the archaic air of his surroundings, give him rather a dodo air, a something that may have had eminently useful purpose at some past time, but now to all common-sense judgment unfitted for the present commercial struggle? All goes against smart photographic business, and the desirable capacity of being able to grasp any new idea and departure in a field markedly rich in them.

Another drawback he suffers from is that, owing to the personal attention needed by his duties and the long hours he has to be at them, there is not the opportunity for acquiring, in pleasant little ramblings and social intercourse with photographers, a practical knowledge of the work. How this handicaps him can be readily judged by the cheap rubbish so frequently shown in his window; and in selling it must surely be more markedly still to his disadvantage, for what can equal in effectiveness the discussion of methods of practical working with a customer?

The same drawback, of long hours and close attention to business, must be held accountable—"though cry this not too loud in the streets of Ascalon"—for the suggestion of sourness of temper, and impatience of contradiction, somewhat noticeable in chemists as a class. This tells unfavourably in the oftentimes tedious, always lengthy, process of persuading a man to part with his money for a camera, or what not. The *ex-cathedra* air of the recommendation that carries off, with remarkable promptness, the sale of a box of liver pills, or bottle of cough mixture, where all the knowledge is on one side and a readiness to try anything for the relief of pain on the other, is decidedly not the best one in selling a photographic article to a customer, with his own fully developed ideas respecting his hobby very much to the front.

I hasten to add that there are many exceptions, especially in the younger ranks, and, if these take up photographic dealing upon the modern lines roughly indicated, they could undoubtedly make a good thing of it, both for themselves and their customers. The Pharmaceutical Society is honourably anxious to lift the professional status of the chemist, and is doing its best to that end, by stiffening examination and aiming at a closer monopoly in the sale of poisons. Whether it can do so, and still make him a business success, is very doubtful. The tendency of the day is against legal monopoly; and, proof of the pudding being in the eating, nine-tenths of the men, after passing their qualifying examination, soon find, in the struggle for bread and cheese, that it pays better to sink the professional side, and fight with such recognised trade weapons as attractive window displays, competitive prices, and free mixing upon equal terms with their fellows. And, as this is a natural evolution occasioned by the force of circumstances, it must have about it more of permanence than any, though admittedly higher, artificial, academic effort of the few in a contrary direction, the natural comforting delusion being, that the chemist will go on improving as a dealer in things photographic.

### ADOPTION OF THE METRIC WEIGHTS AND MEASURES.

ON March 22, the President of the Board of Trade will receive a deputation of representatives from the Decimal Association, Chambers of Commerce, Educational Institutions, and Trades' Unions who will urge upon the Government the compulsory adoption of the metric weights and measures after a period of two years to be allowed for preparing for the change, January 1, 1901, having been suggested as a suitable date for the introduction of the new system.

The agitation for this reform has received a considerable stimulus of late through the numerous and emphatic reports of British Consuls, residing in metric-using countries, who are practically unanimous in stating that serious damage is done to our foreign trade, because of our obstinacy in clinging to our most absurd weights and measures when quoting for goods or giving specifications for material where the metric system prevails.

It is not too much to say that every thoughtful person connected with education in Great Britain would hail the change with enthusiasm, because our children would be relieved from learning or trying to learn



our complicated tables of weights and measures, and the exercise of compound arithmetic would gradually disappear. The time so saved could be used to so much better advantage in other directions, and in these days of keen competition we cannot afford to neglect any such opportunity for economy of time.

The movement originated with Chambers of Commerce, who have for a long time agitated for the introduction of the metric system.

The National Union of Teachers has always strongly advocated this change, and, on more than one occasion, resolutions to that effect have been passed at their annual meetings.

The Trades' Unionists, too, have made a close study of the subject, and are warm supporters of the reform. The Trades' Councils of Manchester and Glasgow, last month, passed resolutions in favour of the objects of the Decimal Association. Representatives from the Trades' Councils of London, Edinburgh, Manchester, Glasgow, Sheffield, Leicester, Bristol, and other important centres, have promised to attend the deputation on March 22, and give the weight of their influence in favour of the objects of the Decimal Association. Roughly speaking, they represent 2,000,000 workers, and their petition should not be disregarded.

### CRYSTOLEUM.

At the meeting of the Leeds Camera Club, on Wednesday evening, March 8, "Crystoleum, with practical demonstrations," was dealt with by Mr. J. Skilbeck. This process, said the lecturer, depended upon the placing of a silver print in optical contact with a piece of prepared glass, the paper support of the print being then somewhat reduced, cleared, and the subject treated with oil colours from the back of the print, or on another piece of glass placed behind it, the ultimate results being most pleasing. There was no great difficulty in the process if the fundamental principles were clearly understood. The print, preferably on albumen paper, should not be too dense in the deepest shadows, and should show all the details quite clearly. Perhaps the most difficult matter they had to contend with was the placing of the print on the glass; and Mr. Skilbeck demonstrated the method he adopted, whereby it became one of extreme simplicity, avoiding all air bells, "slug marks," and, above all, the thorough extraction of the adhesive used. Following on to the clearing of the print, the lecturer showed the different methods they could adopt, pointing out the particular properties of each, and what they should avoid doing in the manipulation. In the one known as the "medium" process it became absolutely necessary to use a preservative coating after the medium had done its work, otherwise, sooner or later, the print became covered with opaque spots; and this preservative must also be mixed with the colours used when being applied to the print. In the "wax" method of clearing, which he also showed, the lecturer said it only became necessary to place the print when mounted and its excess of paper removed into a bath of hot paraffin wax, at a temperature of not over 180° Fahr., allowing it to remain about an hour; and, if when cool any grey markings appeared, they were readily removed by rubbing the print with almost any kind of oil and warming gently in front of the fire. If this method is adopted, poppy oil would be mixed with the paints in the colouring, no preservative being required. In the painting, Mr. Skilbeck advocated the use of two glasses, the principal colouring being on the second; and by this method a softness and quality were obtained quite impossible if all the colouring was on the one glass.

## Our Editorial Table.

DEVELOPER FOR BARNET PLATINO-MATT BROMIDE PAPER.

Elliott & Son, Park-road, Barnet.

Messrs. Elliott have sent us for trial a bottle of a one-solution developer which is recommended for use with their platino-matt bromide paper. The developer keeps well, works cleanly, and can be used for several prints—advantages which practical trial confirms. Mr. Hubert Elliott tells us that he personally uses the developer, the formula for which is as follows:—

Metal .....	200 grains.
Hydroquinone .....	150 "
Sodium sulphite .....	6 ounces.
Potassium bromide .....	50 grains.
" carbonate .....	2 ounces.
Water .....	80 "

Dissolve the metal first and the other ingredients in the order named. One-solution developers will always be highly favoured by large numbers of photographers, and users of the Barnet bromide paper will appreciate the convenience and suitability of the above-mentioned solution for its specific purpose. The Barnet bromide paper continues to manifest the excellent qualities which early won it favourable recognition. Rich blacks, delicate half-tones, and pure whites are looked for in this paper as a matter of course; and therefore it can scarcely be wondered that the paper is meeting with wide popularity at home and abroad.

### THE LOTHIAN STEREOSCOPE.

A. H. Baird, 37 and 39, Lothian-street, Edinburgh.

Two or three distinctive features mark out the Lothian stereoscope as one of great value in practical use. These are apparent from a glance at the illustration. The centres of the oculars are adjustable by a simultaneous movement; the eyes may be placed quite close to the lenses, which are easily removable when it is desired to substitute others of different foci, and the flexible division or septum allows of the instrument



comfortably fitting to the face. The Lothian stereoscope is light and portable and possesses the further advantage that the carrying tubes are made detachable, so that the instrument may be used for examining stereoscopic prints in albums, stereoscopic window transparencies, &c. This is a very great convenience now that stereoscopic book illustration is on the increase. We can thoroughly recommend the Lothian stereoscope.

We have received from Messrs. James Willing, jun., Limited, of 125, Strand, W.C., the twenty-sixth annual issue of *Willing's Press Guide*. This useful book not only gives local and general lists of all the periodical publications issued in Great Britain, but sections are devoted to the Colonial, American, and Continental press. It is an invaluable work of reference to those whom business obliges to have dealings with the press in various parts of the world.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, March 22, at eight o'clock. Mr. E. J. Wall, on the "Stereoscope," &c.

ROYAL PHOTOGRAPHIC SOCIETY.—Photo-mechanical Meeting, Tuesday, March 21, at 12, Hanover-square, at eight p.m. "Automatic Adjustment of the Half-tone Screen," by W. Gamble.

MESSRS. MCKELLEN, LIMITED, of Manchester, write: "It may interest your readers to know that our Company have taken into their employment Messrs. Kershaw, of Buxton, the original inventors of the Roller-blind Shutter, who are assisting in the production of the McKellen Triple-action Roller-blind Shutter."

To meet the growing demand for Luxia P.O.P., and also with a view to the contemplated production of other varieties of photographic printing papers, Messrs. Berger & Co. have found it necessary to considerably enlarge their factory at Hampstead Heath. The new extension affords an additional 30,000 feet of working floor space, and will be completed in another week. The machinery now being installed in this wing is of the most modern type.

The strength of vision in savages proves to be much less extraordinary than was supposed. Dr. Beheim, on a visit to Johannesburg, has tested the sight of 1858 Kaffirs, Basutos, Hottentots, Zulus, and Bushmen, finding 1509 with normal vision equal to that in Europeans, 257 with stronger sight, and eighty-seven with weaker. Phenomenal vision was shown by a Kaffir girl of fourteen, who perceived objects at sixty feet away as well as a normal white could at twenty feet.

EASTBOURNE PHOTOGRAPHIC SOCIETY.—The Committee announce the following competitions, open to all residents in Eastbourne and the neighbourhood within a radius of twelve miles: Competition No. 1.—Class A. For the best Photograph on Paper, representing "A Sussex Landscape." Prize, 11. 1s., offered by Mr. Alderman Farrcombe. Class B. For the best Set of Four Lantern Slides, same subject. Prize, 11. 1s., offered by Mr. T. R. Beckett. Competition No. 2.—Class A. For the best Photograph on Paper, representing "Woodland Scenery." Prize, the Society's medal. Class B. For the best Set of Four Lantern Slides, same subject. Prize, the Society's medal. In Class A each competitor may send not more than three prints. In Class B each competitor may send one set of slides only. Prints may be of any size or by any process, and should be mounted, but not framed. Entrance fee for non-members, 1s., which will entitle competitors to enter in both classes of each competition or either one thereof. Prints and slides must be delivered to the Secretary, Mr. J. J. Hollway, 11, Hyde-gardens, on or before June 1. Any further particulars can be obtained on application to the Secretary.



THE bookseller, Charles Hirsch, of the Librairie Parisienne, No. 4, Princes-buildings, Coventry-street, W., convicted last session of selling, uttering, and publishing an obscene book in the French language, four improper photographs, and procuring and obtaining for the purposes of sale six indecent books printed in English, was last week placed in the dock for sentence. Mr. Loveland-Loveland passed accumulative sentences totalling nine months' imprisonment. His Lordship refused to grant a case on the point raised by Mr. Mathews that it was impossible to corrupt the liege subjects of her Majesty the Queen by the sale of a book printed in a foreign language.

At the London Sheriff's Court, on the 9th inst., before Under-Sheriff Burchell, an important West-end compensation case, *Ellis versus the Baker-street and Waterloo Railway*, came before a special jury for the assessment of damages. The plaintiff was Mr. Alfred Ellis, photographer, of 20, Upper Baker-street, who claimed from the railway company the sum of 17,859*l.*, of which 10,385*l.* were in respect of four years' profits on his business. Mr. Freeman, Q.C., Mr. Foote, Q.C., and Mr. Neish appeared for the plaintiff, and Mr. Cripps, Q.C., Mr. Lloyd, and Mr. Acland for the defendant company. In opening the case Mr. Freeman said the case was one of very great importance to the plaintiff, who had acquired and worked up a most important connexion as a photographer in the West-end. The Company affected were constructing a line of railway from Baker-street to Waterloo, and for this purpose had to acquire many properties, one of which was the premises of the plaintiff. Mr. Ellis commenced business in 1884, and obtained a lease which did not expire until 1908, at a rental of 130*l.* His position was exceptional, inasmuch as his premises were considerably removed from those of any rival artist, and, by dint of great energy, and by reason of the situation he occupied, he worked up a large West-end connexion. From every point of view Mr. Ellis had suffered considerably, and counsel asked the jury to award him substantial damages, to which he considered himself fairly entitled. Mr. Ellis, in the witness-box, corroborated the opening statement of counsel. A verdict was entered, by consent, for 6600*l.*

**SZCZEPANIK AGAIN.**—Szczepanik occasionally gives interviews to the press at his laboratory, and when Dr. Johannes Horowitz, the Vienna correspondent of the *New York Times*, went to see him a short time ago, he found the young man bubbling over with new ideas, in which the ultra-violet rays played a major part. The inventor took Dr. Horowitz into a room in which two miniature railway trains were approaching each other on the same track. At some distance from each other they suddenly stopped. This was another one of the great inventions added to his *répertoire*, and the inventor explains the effect as follows: When the trains are approaching each other on the same line of rails, the ultra-violet rays of light from the lamps act upon the respective electric apparatus, set automatic brakes in motion, and thus stop the trains whether in daytime or at night. The inventor also thinks that, with the aid of the apparatus he is constructing, he will be able to aim guns with absolute certainty. On the enemy's approach the other army would withdraw, leaving behind baggage wagons and other impedimenta loaded with bombs. The explosives are furnished with a small apparatus, the nature of which he does not divulge. When the enemy reaches the camp, a powerful electric or magnesium lamp will shed a light on the explosive material, and, at the same moment, when a single ray falls upon the apparatus, the bombs will all be exploded. In the same way submarine mines would be fired, and, of course, it would be useless to aim guns. Guns could be directed against the enemy without even measuring the distance. With a rectilinear stop, rays would be sent out which would form a wall of light which could not be penetrated by a bomb provided with the apparatus without its bursting. Instead of the present problems of aiming and measuring with guns, it should be practically, in the future, aiming at a light. These are only a few of the stories which emanate with delightful frequency from the laboratory of this gentleman, who is blest with such a fertile imagination.

## Patent News.

THE following applications for Patents were made between February 27 and March 4, 1899:—

**PRINTING FRAMES.**—No. 4264. "Improvements in Photographic Printing Frames." L. HUDSON.

**NATURAL-COLOUR PHOTOGRAPHY.**—No. 4290. "An Improved Process for the Production of Photographs in Natural Colours upon Paper or other Flexible Support." G. SELLÉ.

**COLOURED PHOTOGRAPHS.**—No. 4601. "Improvements relating to the Production of Coloured Photographs and to Apparatus for Viewing the same." Complete specification. R. W. WOOD.

**FILM-HOLDERS.**—No. 4621. "Improvements in or relating to Cameras, and in Appliances for Holding Films or Plates, with Means for Securing such Films or Plates in Position, and for facilitating the Removal of the Film or Plate-holders." J. N. WRIGHT.

**DEVELOPING PLATES.**—No. 4695. "An Improved Portable Apparatus for Developing and Washing Photographic Plates and the like." J. PUMPHREY.

**CAMERA STAND.**—No. 4696. "An Improved Camera Stand for Attachment to Cycles." J. PUMPHREY.

**PHOTOGRAPHY.**—No. 4802. "Improvements in Photography." T. D. LICHTENSTEIN.

**DEVELOPING AND FIXING.**—No. 4808. "Process for simultaneously Developing and Fixing a latent Photographic Image." Complete specification. L. ELLON.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
20.....	Barnet and District .....	In Northern Latitudes with a Camera. Lewis Medland, F.Z.S.
20.....	Bradford Photo. Society .....	Trade Demonstration with Lantern Slides. Thornton-Pickard Company.
20.....	Camera Club .....	In the Footsteps of Wordsworth. Percy Lund.
20.....	Kingston-on-Thames .....	Social Evening.
20.....	Richmond .....	Lantern Evening: Prize Slides.
21.....	Beverley .....	A Visit to America. H. W. Ward.
21.....	Birmingham Photo. Society ..	Methods of Working. W. Smedley Aston.
21.....	Gospel Oak .....	General Meeting.
21.....	Hackney .....	Prize Slides.
21.....	Ile of Thanet .....	Helps and Aids to Amateurs. G. F. Blower.
21.....	Lewisham .....	The Chemistry of Development and Reduction. A. J. Dickenson, F.I.C., F.C.S.
21.....	Royal Photographic Society ..	Automatic Adjustment of the Half-tone Screen. W. Gamble.
22.....	Croydon Camera Club .....	Ninth Annual Dinner.
22.....	Leeds Camera Club .....	Some Analogies of Light. Mr. Heywood.
22.....	Photographic Club .....	The Spectroscope, &c. E. J. Wall.
23.....	Ashton-under-Lyne .....	Exhibition of Members' Lantern Slides.
23.....	Beverley .....	Demonstration with Hardcastle's Platinum Paper.
23.....	Bolton Mutual Photo. Society ..	Lecture.
23.....	Camera Club .....	Exploration in the Canadian Rockies: a Search for Mount Hooker and Mount Brown. Professor Norman Collie, Ph.D., F.R.S.
23.....	Darwen .....	Lantern slide Making.
23.....	Liverpool Amateur .....	On the Great Ouse. Dr. J. W. Ellis, F.E.S.
23.....	London and Provincial .....	Open Night.
23.....	Woolwich Photo. Society .....	Platinotype. W. H. Dawson.
24.....	Croydon Microscopical .....	Faults and Blemishes in Photographs and their Remedies. E. Dockree.

### ROYAL PHOTOGRAPHIC SOCIETY.

MARCH 14.—Ordinary Meeting.—Mr. Chapman Jones, F.I.C., F.C.S. (Vice-President), in the chair.

#### BUSINESS ITEMS.

The CHAIRMAN announced that the Council had appointed Messrs. A. Mackie, J. A. Sinclair, and H. Snowden Ward as the delegates of the Society to the Affiliation Committee, and also that the following members had been appointed to form the Exhibition Committee in connexion with the forthcoming annual Exhibition: Messrs. R. Child Bayley, W. E. Debenham, T. Fall, Chapman Jones, F. C. Lambert, A. Meckie, J. C. S. Mummery, J. A. Sinclair, and J. B. B. Wellington. It was further announced that Miss Boden, and Messrs. R. Child Bayley, T. Bullen, W. Hargrave Cooper, Goldie, A. H. Marsh, and W. Taylor had been admitted as Fellows of the Society. Fifteen new members were elected, and six candidates for membership were nominated.

#### COLOURS FOR THREE-COLOUR PRINTING.

Captain W. DE W. ABNEY, C.B., D.C.L., F.R.S., &c., read a paper, which he illustrated by many experiments, entitled "Theoretical Considerations in Choosing Colours for Three-colour Printing," a subject which he said he was induced to bring forward because it was uppermost in the mind of the photographic public at the present time, and more especially as a good many workers were following out a "rule-of-thumb" guidance not based upon scientific principles. He commenced by a reference to his recent determination of the colour sensations, now under the consideration of the Royal Society, and said that the colours most nearly approaching to the three sensations were vermilion, to which a little blue was added to take off the yellowness of the scarlet, emerald green, and true ultramarine. This point had a great deal to do with the question of the inks to be employed in trichromatic printing, because, for the attainment of correct rendering, the inks must be absolutely complementary to the colour sensations. It was a curious fact that the only gelatine plate he had met with which would reproduce the spectrum accurately was an ordinary plate unorthochromatized, used with suitable screens; an ordinary plate was not only sensitive to the blue, but also, to a less degree, to the green, and still less to the red, with exposures of approximately 1, 8, and 100. Captain Abney's paper may best be summarised in the words with which he concluded, as follows: "In order to get correct colour printing, you must first of all consult the three sensations, if you want to get the purest prints possible; that is to say, take the colour which is a little below C of the spectrum for the red, take one which is about one-tenth of the distance between E and F of the spectrum for green, and take the blue lithium line as the colour for blue; these are the three colours which answer best of all for triple projection. In order to get the proper printing colours, you must get the very complementaries of these, and, if you want purity, these complementaries must overlap as little as possible, and in any case they must always be separate parts of the spectrum; unless this condition is observed—if one colour overlaps another—you will get muddy prints, and prints which are incorrect in colouring. After looking at a great many prints from various sources, I have come to the conclusion that, as a rule, they are correct in the yellows, wrong in the blue-greens, and wrong in the pinks; the consequence is that the greens are always too blue, and very often the reds are too yellow, for there is not enough blue in the pink, and not enough green in the blue. This remark applies only to transparent inks. It seems to me that the great failure at present in colour printing arises from the use of the wrong-coloured inks. I think the photographer may be left



to take a proper negative; he can do it if he has a mind to and if he uses the proper sensitometer, and I have in a former communication shown how to use a colour sensitometer for making the screen. It only remains for the ink-maker to step in and show what he can do in the way of producing the proper colours. With the colours which I have shown accurate prints may be obtained. Of course, what I have to say is all theoretical, but theory cannot be altogether ignored. If the practical man will imitate these colours—not in aniline dyes, which will fade, but in some colours which will be permanent—he will have conferred a distinct boon upon those photographers who are trying triple printing. The photographer has done his work; it only remains for the ink-manufacturer to do his, and when he has done it I think the day will be near when trichromatic photography will become a bigger success than it is at the present time; but one cannot now examine reproductions of coloured objects without seeing that there is something wrong with them, and I have endeavoured to night to point out the manner in which that error may be removed."

Mr. E. SINGER-SHERPHEARD, by way of emphasising the importance of working according to theory, rather than by "rule-of-thumb," said he had lately made some screens with the aid of Captain Abney's colour-sensitometer and Mr. Cadett's luminosity-measuring apparatus, and with them had secured perfect renderings of landscapes, paintings, and a colour chart, at the first attempts. With regard to inks, the difficulty was to obtain transparent pigment colours to match the absorptions; the theoretical colours could be very nearly matched in aniline inks, but unfortunately these inks had been proved to be very fugitive.

Mr. J. W. LOVIBOND said the subject involved a revival of the old controversy as to what were the primary colours, and he differed from Captain Abney on this point. Until each pigment had its own law of absorption, a law specific to itself, he did not see how a printer could select a pigment which should combine all the advantages necessary to the production of a perfect print. A great deal more light must be thrown upon the subject before any hard-and-fast rule could be laid down for the practical man, who by his work ascertained experimental facts upon which all true theory should be based.

Mr. WARRING showed some slides to illustrate the various mixtures possible with three simple colours.

The CHAIRMAN said it had been stated that, although three colours were very well so far as they went, four, five, or six colours would be better; and he asked Captain Abney's opinion upon that point, and also as to the importance of the colour-sensation curves in connexion with the subject of three-colour work.

Captain ABNEY, in the course of his reply to the brief discussion, said that, as there were only three colour sensations, the fewer the colours used the simpler and more effective would be the process; and no purpose would be served by using more than three. The sensation curves had a very important bearing upon the result, for, to secure bright prints, the colours of the inks must be those most nearly complementary to the true sensation colours.

A hearty vote of thanks was given to Captain Abney for his valuable paper.

#### COMING EVENTS.

March 21, Photo-mechanical Meeting. "Automatic Adjustment of the Half-tone Screen," by Mr. W. Gamble. March 28, Technical Meeting. "Ozotype with Carbon Tissue: a New Method of Pigment Printing," by Mr. T. Manley.

**Cripplegate Photographic Society.**—This Society held its first Lantern Night on Monday, March 6. It is matter for congratulation that the members turned up in full force with their friends, and a very successful meeting was spent, the slides on the whole being above the average. The next meeting is fixed for Monday, April 10, when Mr. A. Horsley Hinton will give his well-known lecture on "Practical Pictorial Photography." Early application is requested for tickets. Admission free, but a few seats will be reserved at 6d. and 3d., obtainable of Mr. Alfred T. Ward, Hon. Secretary, Cripplegate Institute, Golden-lane, E.C.

**Croydon Microscopical and Natural History Club (Photographic Section).**—Friday evening last was devoted to an exhibition of some 160 slides by Mr. A. P. Holes, of the Sutton Photographic Club, comprising views in the Channel Islands, Norfolk Broads, and Lake District. All those who read Mr. Holes's paper on "Lantern-slide Making" were quite prepared for a treat, and they were not at all disappointed, the slides shown being of unusual excellence. The views in the Channel Islands showed the character of the streets, buildings, and habits and customs of the people, besides the conformation of the coast. Those of the Norfolk Broads indicated the nature of the country, the disposition of the water, the reeds growing therein, the method of cutting and carrying them, and the yachts and wharves which abound there. The skies in these slides were a special feature and very beautiful; but perhaps best of all were the slides of the Lake District; the charming views, the clouds, and perspective were much appreciated, and it seems a pity this gentleman's slides should not be seen in London. Mr. Ballock manipulated the lantern.

**Hackney Photographic Society.**—March 7, Annual General Meeting.—The report and balance sheet submitted showed the Society to be in a thoroughly sound and flourishing condition. The result of the election of the new executive was as follows:—*President:* Mr. W. F. Fenton-Jones.—*Council:* Messrs. A. Barker, E. Farmer, C. T. Fleetwood, F. W. Gosling, E. Puttock, W. Rawlings, J. J. Westcott, and L. S. Wilks.—*Curator:* Mr. W. A. Ellington.—*Liaisonist:* Mr. Roland Smith.—*Exhibition Secretary:* Mr. S. C. Stan.—*Treasurer:* Mr. W. L. Barker.—*Hon. Secretary:* Mr. W. Selfe.—*Assistant Secretary:* Mr. A. D. Fort.

**Liverpool Amateur Photographic Association.**—On March 9 a crowded and interesting assembly to hear Dr. C. Thurston Holland lecture on the

#### X RAYS UP TO DATE.

The lecturer first proceeded to explain the nature and working of his valuable apparatus, and then spoke of the various improvements which he had effected

since its discovery. Numerous radiographs, which he has taken in his capacity as a medical officer, were next shown on the screen, and excited the admiration and applause of the audience. Dr. Holland, during his lecture, said that, in his opinion, doctors should not perform operations unless they were aided by the wonderful Röntgen Rays, which, up to the present, had proved of invaluable service to the medical profession.

**Redhill and District Camera Club.**—March 7.—The PRESIDENT (Dr. Dufton, M.A., D.Sc.) gave a *Beginners' Night*. The President began by drawing attention to the advantages of a long-focus camera and compound lens, demonstrating how to partially do away with the trouble of the magnification of objects in the immediate foreground by using a single combination of the lens and racking out the body of the camera. He then touched upon the importance of the correct exposure of the plate, recommending all beginners to use an exposure meter. Remarks on developing the plate and on printing and toning of various papers followed, and a demonstration of printing and developing Velox paper was given. At the close of his lecture, Dr. Dufton exhibited a very ingenious home-made enlarging box. A discussion followed on halation and its possible prevention, the general opinion being that the backing of the plate was of little or no use as a preventive. Mr. WILLIAM BROOKS, of Reigate, said that he did not believe in backing plates; that the surest method of preventing halation was the use of a very thickly coated plate; he also drew attention to the danger of using metol developer, owing to its action upon the skin of the hand and fingers. At the close of the meeting a flashlight photograph of the members was taken by Dr. Dufton.

#### FORTHCOMING EXHIBITIONS.

1899.

March 20–May 13 ... National Trades and Industrial Exhibition, Bingley Hall, Birmingham. Manager, Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.

April 3, 4 ..... Beverley. T. J. Morley, Toll Gavel, Beverley.

„ 12, 13 ..... Plymouth Photographic Society. Hon. Secretary, W. H. Harris, 91, Cobourg-street, Plymouth.

#### Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### WANTED, A CHEAP ROLLABLE FILM.

To the EDITORS.

GENTLEMEN,—Prompted by the letter of "H." in your last, and in reply thereto, there used to be, some years ago, the very thing in the market which "H." yearns for, made by the Eastman Company. I used most successfully a dozen or more forty-eight exposure twelve-inch spools of their paper-stripping film in a roller slide and camera, also bought of the Eastman Company, carrying the whole outfit over hill and dale on a bicycle, when, to my deep chagrin, they rendered the whole thing useless by giving up making the paper-stripping film. I have endeavoured to use the films now made by them and other firms, but twelve inches wide is not procurable, and, more than that, ease of manipulation and quality of negative is far below the paper-stripping film, to mention one virtue only, the absence of halation. Let the Eastman Company renew their output; I should again be a user.—I am, yours, &c.,

W. BARRY.

7 and 8, Park-street, Anlaby-road, Hull, March 7, 1899.

#### ANIMATED PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I am pleased indeed to see in your last issue that Mr. Friese-Greene's efforts as a pioneer of animated photography are at last acknowledged in print; it will be well if the world's papers copy it and spread it as broadcast as they have done the names of other "inventors" "of this most notable of modern photographic achievements," and also that the Chester meeting of the Photographic Convention was the *locale* where the camera first saw daylight. If the group taken on the steps of Eaton Hall, during a heavy rain, by Watnough Webster, is examined, Mr. Friese-Greene, with the camera in his hand, will be seen stood on the observer's left.—I am, yours, &c.,

W. BARRY.

#### CALCIC CARBIDE.

To the EDITORS.

GENTLEMEN,—Acetylene Gas: "The colour of the residue left in the generator indicating the temperature at which the gas was given off."

In yours of the 3rd inst. (LANTERN SUPPLEMENT), a statement is made "that, if the residue is black, a high temperature has been reached." I much doubt the accuracy of this statement. Large quantities of carbide have passed my observations while making acetylene gas, and I have no doubt that the black colour of the residue is principally due to inferior



carbide. A rather large proportion has given not only black residue, but has remained black and unaltered, as so much coal would have done, subsequent immersion in shallow trays of water failing to produce any change. It is quite easy, on inspection of the so-called carbide of calcium, to pick out the pieces, which only give off a small quantity of gas and leave a black residue.—I am, yours, &c.,  
VEDA.

### STUDIO BUILDING.

To the Editors.

GENTLEMEN,—In view of the inquiries you so often receive with regard to the building of studios, it might possibly interest your readers to know that a few notes on the subject appear (for the first time, I think, in a professional architectural paper) in the just-published volume of *Specification*. (London: Office of the *Architectural Review*, Effingham House, Arundel-street, Strand. 5s.) The notes are entitled "The Design of Photographic Premises," and are by, yours faithfully,

DRINKWATER BUTT, F.R.P.S.

35, Keppel-street, Russell-square, W.C., March 7, 1899.

### FREE PORTRAITURE.

To the Editors.

GENTLEMEN,—You have recently adversely criticised Messrs. Tanqueray and others, of Paris, as to their method of business. May I ask you if it is not analogous to the following copy of a letter sent to ladies previous to Her Majesty's Drawing-room? I may say many other pleas are alternated. "As we are compiling an album containing a series of panel photographs of ladies presented at Her Majesty's Drawing-room, we will thank you for an early sitting, so that yours may be included, for which we make no charge. Proofs will be submitted to you prior to sending the album to Her Majesty."—I am, yours, &c.,  
A PHOTOGRAPHER.

March 7, 1899.

### THE LEEDS CAMERA CLUB AND THE YORKSHIRE PHOTOGRAPHIC UNION.

To the Editors.

GENTLEMEN,—The epitaph to Wren, the architect, in St. Paul's, may be translated, "If you seek my monument, look around."

If you seek the proof of the statement contained in my letter to you of last week with regard to the reasons why the Leeds Camera Club did not join the Yorkshire Union, read *THE BRITISH JOURNAL OF PHOTOGRAPHY* of last week (p. 153—only six pages from Mr. Clough's letter in reply to me), and confirmation of our reasons stares you in the face. I must confess I had not expected this would be so manifest so soon. I had thought that the credulous fifteen subscribers would have had, at least, a run for their money, but evidently, although I hadn't sufficient faith to swallow the promises held out some few weeks ago by Mr. Clough and his self-ordained covenant, still I had a bit too much.

From the report it would seem that the Society's delegates grow impatient for the fulfilment of those allurements—they ask for something practical. Mr. Briggs says the chief one, as I said last week, is "a mathematical absurdity," and he wasn't, for an obvious reason, contradicted. Wakefield threaten to "reconsider their position," and Keighley "strongly support." Mr. Godfrey Bingley of Leeds—reasonable, patient, peace-loving Mr. Bingley—quotes "I shall object." But all that is done is for Mr. Percy Lund to suggest ginger bread rules instead of "cast-iron" ones, and for Mr. Ezra Clough, like Nero fiddling over burning Rome, to write long letters to the papers, and wander down the groves of Bradford, culling such bearded old chestnuts as the one he offered to us in his last letter.

We, in the Leeds Camera Club, congratulate ourselves more, day by day, that we decided as we did. Personally I have publicly expressed my best wishes for the welfare of the Union, but I realise that whilst the time of its promoter and principal official is occupied in the demonstration of the educational art of encyclopædia letter-writing, with allusions to ancient history and mythology, Dalton, Huxley, Darwin, and Clough, Shakespeare and the man in the stocks, its chance of success is being seriously jeopardised.

In the words of the immortal Ducrow, I strongly advise Mr. Ezra Clough to "cut the cackle and get to the 'osses," before he finds the 'osses have got out of hand.—I am, yours, &c.,  
W. J. WARREN.

13, Bedford-street, Leeds, March 11, 1899.

### AN ASSISTANT'S DILEMMA.

To the Editors.

GENTLEMEN,—In reference to memorandum in this day's *BRITISH JOURNAL OF PHOTOGRAPHY* re assistant's dilemma, "W" and "F. S." are certainly not the only assistants who find a difficulty in getting a situation. I am a first-class assistant myself, and have had eight years' experience in every branch of photography, and have written for the past four weeks answering advertisements as operator and manager, &c., for business. I have sent photograph of self and references to several,

but have not had so much as a reply; in fact, I may state I wrote to one of the firms asking for return of specimen photograph, &c.

I have a very solid suspicion that there are a few bogus photographers who advertise and request specimens and photographs of applicants to be sent.

I concur with "A. A." in his letter; it is not a first-class assistant that is required nowadays, but perhaps it would be better to term them dabblers; a first-class assistant gets what I call insulted if he makes an application for a situation in a responsible capacity by the advertiser offering, not only a married man, but others, the handsome amount of from 30s. per week to take sole charge, &c., of a photographic business.

I think that "A. A." in his letter is quite right, and would be glad to be a promoter, with others, for forming an Assistants' Protection Union for obtaining more just treatment.—I am, yours, &c.,  
W. A. KIDD.

520a, Commercial road, Portsmouth, Hants, March 10, 1899.

To the Editors.

GENTLEMEN,—Re the above question, my experience is very much the same as "J. A. H." Now, for the benefit of assistants in general, no specimens of work should be sent in the first instance in answer to an advertisement when only a number is used, nor original references, but a copy of the same, saying salary expected and other full particulars, &c., stating, if application is considered, specimens will be forwarded on condition that they will be returned with the least possible delay. By so doing one would learn who one is dealing with. And I also advise assistants engaging on a month's trial, if there is any doubt, this would be fair on both sides. If assistants in general would act as above, it would benefit both employers and assistants, and dispense with a great deal of annoyance.—I am, yours, &c.,  
A. F.

### OPERATORS AND AGREEMENTS.

To the Editors.

GENTLEMEN,—Being a well-known photographer in Weymouth, in justice to myself I must ask you to kindly state in your next issue that the letter, re "Operators and Agreements," in last Friday's *JOURNAL*, did not refer to me.

I may add that both my assistant operator and retoucher, and young lady assistant, have been with me for over eight years.—I am, yours, &c.,  
C. F. HEWITT.

29, St. Thomas's-street, Weymouth, March 14, 1899.

### SPECIMENS.

To the Editors.

GENTLEMEN,—I read Mr. French's caustic effusion with some amusement, and also with a great deal of disgust. In the first place, the editor of our leading photographic paper is quite capable of managing his own business without instructions from any amateur editors as to what they think he shall or shall not insert in his paper.

Mr. French also fears that the "wording of the advertisement leaves little doubt," &c. I'm glad to hear it; it was made plain enough for even the densest intellect to grasp.

May I ask, however, what Mr. French would do were he situated as I am at present. I have never yet shown a photograph in my cases that was not my own *bonâ-fide* work. Be it known, however, that, as an act of courtesy, I invariably ask for permission to do so before I exhibit a sitter's photograph. A very great many have, however, lately expressed the wish that I should not do so, and, at the moment, I find myself very short of specimens of a certain style which are wanting to complete a fair representation. Can Mr. French suggest any other way out of the difficulty? At the same time, any photographer who places in his show-cases better specimens—bought or otherwise—than his average productions is certainly deserving of the severest criticism; but, as long as his output equals in quality his specimens, I fail to see how it matters in the least where the specimens come from.

I must thank you, Mr. Editor, for your very open-minded view of the subject, and apologising for trespassing so much on your valuable space.—I am, yours, &c.,  
PROFESSIONAL.

To the Editors.

GENTLEMEN,—The letter of Harry French has greatly pleased me, and I believe a great many photographers will also agree with me in appreciating the sentiments he expresses. The opinion that such advertisements are both injurious to photographers and to the public strongly presented itself to me. Passing off other men's work as one's own is a fraud, and calculated to injure the more upright members of the profession.

Your allusion to enlargements and coloured prints does not illustrate the point at issue; these may or may not be the work of the photographer whose window they embellish; if not, he simply implies that he is prepared to supply similar pictures, which he probably does from the



same hands as those supplying the exhibits; but, when "attractive specimens" by other operators are exhibited, the public are led to believe they will be supplied with equally good work at the shop exhibiting them. If, and this is a big if, they receive as good work, not much harm is done, but my experience of beginners and others who show other men's work in their windows is that they do not.

I am constantly hearing, "I went to So-and-So. He has very good pictures in his window, but I did not like what I got from him a bit." And, doubtless, such complaints are within the experience of the majority of photographers. I should like to hear the opinion of others in business in large towns, for in these the system is rampant.

As for men just starting in business, they may do as I did, print from negatives actually taken by themselves before starting business, and supplement them, if necessary, by views and portraits of their friends taken for that purpose.

Hoping you will give this letter a place in THE BRITISH JOURNAL OF PHOTOGRAPHY, I am, yours, &c.,  
W. R. GAIN.  
201, Lake road, Portsmouth.

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPH REGISTERED:—

D. Lloyd, photographer, Old Chapel House, Kidwelly, Carmarthenshire.—Photograph of group of rocket-brigade men of Castleown, Isle of Man.

TEILO.—The actual makers we do not know, but the goods are obtainable of Messrs. Marion, Soho-square, W.

S. HANNA.—One of the Kodak or Frena type should suit your requirements. We do not answer questions by post.

R. C. V. LANG.—1. Plates. 2. Grooved tanks suitable for the purpose are obtainable from most dealers. 3. Glycin.

H. BARRETT.—The groups are fair, but there is room for improvement. The portraits show promise, but study in lighting and posing appear to be essential. The vignetting is somewhat crude.

MARYPORT.—We cannot tell you the cost, but it should not be more than a few shillings. Messrs. Penrose & Co., Upper Baker-street, Lloyd-square, would probably undertake the work for you.

J. TAYLOR.—We do not answer questions by post. See the ALMANAC for 1889, in which the processes are described in the course of an article on "Iron Printing." Messrs. Marion, we believe, supply the papers.

S. TALLON.—We do not think the proposed plan would work. The fact that the three pictures are taken from as many points militates against correct registration. You do not say how you would make the exposures.

FINISHING ENLARGEMENTS.—A. M. MATTHEWS says: "I should like to know if there is a book published on finishing enlargements," &c. &c. In reply: There are some useful chapters in Johnson's *Retouching*, published by Marion & Co., Soho-square, W.

A. BAKER (Derby-street, Burton-on-Trent).—1. The greenness shows the presence of copper, which was, doubtless, in the residue. 2. By precipitating the silver and re-fusing it, the copper will be got rid of. 3. Only by the appearance of the contents while in the crucible.

MOUNTANT.—R. S. N. The mounting paste mentioned is a trade preparation, and we are not aware what it contains. Therefore we cannot express any opinion as to the effect it may have, or may not have, on silver prints. It is, however, a convenient mountant to use.

J. H. HOGG.—Mr. H. E. Davis, the Camera Club, Charing Cross-road, W.C., will send you particulars of the Florence Exhibition, but we believe that the time for making entries has expired. As to the "French Exhibition" you refer to, we know nothing. What Exhibition do you mean? We do not reply by post.

MARKED NEGATIVES.—ABBE.—The prints show that the marks on the negatives are caused by emanations from the hinges of the shutter of the dark slides. The only way of avoiding the trouble is to have fresh material, which is inert, put on the hinges. If the plates are only left in the slides for a few hours, in all probability there will be no injury done to them.

ENAMELLING.—F. TYFORD asks: "Will you kindly inform me where I can obtain a detailed account of the method of enamelling photographs? I do not mean simply squeezing a print to a piece of plate glass, but the method wherein collodion and gelatine are used."—In reply, Piquepe's *Enamelling* is a book that should suit your requirements; or you will find two or three processes described in the ALMANAC for 1886.

BOOK ON COLOURING AND MINIATURE PAINTING.—ARTIST says: "I shall be grateful if you will kindly recommend some inexpensive books on colouring and miniature painting."—We are not aware of any works devoted to miniature painting. Some have been published on colouring photographs, but we think they are all now out of print, except, perhaps, one that is published by Newman & Co., Soho-square; that is an inexpensive work.

PRINTING PROCESS.—RED CARBONS says: "I should esteem it a great favour if you could kindly inform me of what make is the enclosed paper, also how worked. I have been trying several papers for red carbons lately, but cannot get such good results as the enclosed."—We cannot say by whom the tissue, on which the enclosed print was made, was manufactured; but the Autotype Company, Messrs. Elliott & Son, and others supply tissue of similar colour. Any of the manuals on the carbon process, such as that published by the Autotype Company, give full working details.

REPRODUCED NEGATIVES.—A. MAKENZIE says: "I have a portrait negative of a clergyman who has just died, and I expect to sell a good number of copies if I can get them out sharp. I have reproduced the negative, but the new ones are all weak and flat, although I have tried several different makes of plates and intensification as well. Can you tell me the reason?"—In all probability, the transparency is at fault. Unless that be vigorous, it will be impossible to get vigorous negatives from it. Secure a strong transparency, and there will be no difficulty in getting strong negatives from that.

MONCKHOVEN'S INTENSIFIER.—AJAX says: "I made the cyanide-silver solution for Monckhoven's Intensifier in accordance with the instructions in the ALMANAC. I got an immense amount of flocculent, whitish-brown precipitate, which will not dissolve. I used distilled water, and I added the silver solution to the cyanide solution. Can you suggest the cause of my failure?"—The solution contains undissolved cyanide of silver. The cyanide of potassium should be added to the silver solution till the cyanide of silver, thrown down, is redissolved. The cyanide should be added to the silver, and not the silver to the cyanide.

CRACKED OIL PAINTINGS.—G. W. says: "Can you inform me the best way to fill in an oil painting on canvas? A customer of mine brought me an oil painting, a large one of a man done on canvas, and it is cracked through the face by something that was put against it when moving furniture, &c. What would be the best method to take out the crack across the face? I have to frame the painting afterwards."—This is the work of a picture-restorer and should not be undertaken by a novice, as he would probably ruin the painting. Doubtless the picture will have to be relined after repairing. Repairing paintings requires the work of experts.

STEREOSCOPIC PORTRAITURE.—W. BIRD writes: "I have an old camera fitted with a pair of quarter-plate portrait lenses, originally used for cartes-de-visite, which I wish to utilise for stereoscopic portraits. By putting the lenses as close together as the flanges will allow, the centres of the glasses are nearly three and a half inches apart. Is that too great a distance, or must I get smaller lenses?"—The distance is too great for portraiture. It should not exceed two and a half inches, or, at most, an eighth of an inch or so more. By cutting a piece off each of the flanges, the lenses can be brought closer together, and probably within the prescribed distance.

SPECTACLES.—RETOUCHER writes: "I find my sight is not so good as it was, probably because I am getting older. I have lately got a pair of spectacles, but I find, after working an hour or two, my eyes get very sore, and water a great deal; indeed, though I can see better, my eyes become more painful with the strain than without the glasses. Can you suggest anything to help me?"—It is very clear that the spectacles you have got do not suit your sight. We should advise you to have your eyes examined by an oculist, who will prescribe suitable glasses. If you cannot afford to visit a specialist, go to one of the Ophthalmic Hospitals—that at Charing Cross, or the one at Moorfields.

FOCUSSED BY SCALE.—S. writes: "I am much interested in your leading article, of March 3, as to 'Focussing by Scale,' but how can the accuracy of the arrangement be tested in the case of most hand cameras, which are either Magazine or Kodak? Any information would be most obliging. As a very old photographer, and a subscriber of some years, I always look forward with interest to the arrival of THE BRITISH JOURNAL OF PHOTOGRAPHY. I began about 1855, with the old collodion wet-plate process. I now use quarter-plate size and enlarge."—The only way of really verifying the scale is to place a piece of ground glass in the place occupied by the plate and then examine the image, at the different distances, with a magnifier.

STUDIO BUILDING.—F. W. G. says: "I shall be extremely obliged to you if you can possibly give me a little information. I wish to build a studio. The light will be S.E. aspect; do you think it would be suitable for portraits? The length of the yard is 19 feet long by 12 feet; would that be suitable for a studio? also, how much top light and side light I should require, and what angle? Which side would be the best to light from, the left or right side, with the light S.E.?"—The aspect will do very well, but nineteen feet will be very short for a studio for portraiture, as it will necessitate the use of very short-focus lenses. We should say, with a S.E. aspect, arrange to light the sitter on either side, as occasion may require—i.e., work both ends. Have a good slope to the roof.

COPYRIGHT QUERY.—S. writes: "A year or two ago I took a portrait of a well-known man in our place as an ordinary sitter. He has just died, and the family have taken one of my photographs to another photographer to enlarge, and, I am told, given him permission to copy the enlargement when done and sell copies of it, which is very unfair to me, as the gentleman would not allow me to sell his portraits. The family have also refused me permission to do so. Now, cannot I make the portrait copyright and prevent this injustice?"—No, you have no copyright in the portrait, and the family can do as they like in the matter. As you were paid for taking the portrait, we fail to see that there is any injustice. It is, however, disappointing to you not having the commission.



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No. 2029. VOL. XLVI.—MARCH 24, 1899.

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## EX CATHEDRÂ.

Will our readers and correspondents kindly note that, as Good Friday falls next week, THE BRITISH JOURNAL OF PHOTOGRAPHY will go to press one day earlier than usual? Communications intended for the issue of March 31 should therefore reach us by the first post on Tuesday morning, March 28.

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LAST year Mr. F. E. Ives delivered, at the Bolt-court Technical School, a series of four lectures on the theory and practice of half-tone etching. These lectures, which are exceedingly valuable and exhaustive, have been reproduced in the January number of the *London Technical Education Gazette*. This is published by Messrs. P. S. King & Son, 2 and 4, Great Smith-street, Westminster, price twopence, and we recommend every one interested in half-tone work to procure a copy of the particular number of the *Gazette* mentioned. The lectures are so full of sound information that they should be permanently at hand for reference. In connexion with the Bolt-court School, the *Gazette* points out that in the Elementary Day-

school Code there is a clause permitting children to visit institutions of educational value, such visits to count as school attendances.

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THE *Gazette* adds that the Technical Education Board considers that, under this provision of the Code, much can be done to interest school children in the various mechanical trades and artistic crafts of the present day by arranging for visits to be paid to educational institutions where instruction in such trades and crafts is given. The photo-process trade appears to adapt itself very well for this purpose, as the different processes involved in the trade are of considerable interest and variety and lend themselves readily to practical demonstrations. It is proposed, therefore, to offer opportunities at the Bolt-court Technical School, 6, Fleet-street, E.C., for demonstrations to be given to selected children from public elementary schools, with the view of interesting them in the photo-process and kindred industries. Headmasters of public elementary schools for boys, whether Board or Voluntary schools, are invited to apply to the Board for permission to be given to a selected number of their pupils to visit the Bolt-court School.

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THE principal conditions under which such visits will be arranged are the following:—(a) The older pupils of the school are in all cases to be selected, preference being given to pupils of thirteen or fourteen years of age. (b) Not more than six pupils can visit the school at any one time, as the rooms in which the work is carried on are too small to enable a greater number to be properly accommodated. (c) The pupils must be under the charge of a teacher, who will be responsible for their good conduct. (d) Application should be made to the Secretary of the Board by the headmaster. It is proposed that three visits should be arranged in consecutive weeks, if possible, on the subject, "The Making of a Process Block for Printing," at the following times:—*First visit*: Negative-making—Wednesdays, 10.30. *Second visit*: Preparation of resist for line and half-tone etching; specimen of half-tone etching—Thursdays, 10.30. *Third visit*: Etching of plate prepared in previous visit—Thursdays, 10.30. A fourth visit might, if wished, be arranged, when the subject of "Preparation of Lithographic Transfers" would be dealt with. Friday morning would be the most convenient for this last subject. Headmasters who



desire further information, or who wish to make application to the Board, are asked to communicate with the Board's Secretary at an early date. We have great pleasure in giving publicity to the details of the proposed experiment, which we hope will be carried out, and be of value in interesting young people in photography at an age when the awakening of their regard in such matters is best calculated to prove of permanent benefit.

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Messrs. UNDERWOOD & UNDERWOOD, of 26, Red Lion-square, W.C., whose stereoscopic photographs have during the past few years become very widely known, are making a departure which will have the effect, it may be conjectured, of increasing the growing interest in stereoscopic photography which the public is manifesting. Acting on the hint of that enthusiastic stereographer, the late Dr. Oliver Wendell Holmes, whose proposition was for the creation of a comprehensive and systematic stereographic library, Messrs. Underwood are now classifying their stereoscopic slides into sets of travel. They offer a number of these sets for sale. The scenes are arranged and numbered consecutively, and carry those who view them through the stereoscope from one place to another in the same order that a tourist visits them.

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A REVOLVING cabinet is supplied containing fourteen series, embracing Japan, Egypt, Palestine, Greece, Italy, Russia, Austria, Germany, Switzerland, France, Great Britain, Scandinavia, United States, and Canada. These are accompanied by stereoscopes, and, in some cases, descriptive books. The sets range, in number of stereographs, from 60 to 120. We wish this excellent idea success. Moreover, we trust that Messrs. Underwood's undoubted enterprise will not stop short at paper slides, but that, as time goes on, they will decide to take up the preparation of stereoscopic transparencies, than which, when they are properly made, nothing more beautiful can be produced by photography.

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THE American Photographic Convention takes place at Celoron in July next, and the Treasurer is already at work in the endeavour to induce a large attendance of his brethren. He appeals to them by the media of several of our American contemporaries; and we have thought that the terms of the enthusiastic official's proclamation might have some interest for our professional readers, who, we are sure, will agree that the sentiments he utters do him credit: "I would respectfully call attention to our next Annual Convention to be held at Celoron from July 17 to July 22 inclusive. The executive board having held session and passed upon the many difficult problems arising, to the best of their judgment with equal fairness to all, call upon you for your indorsement, your exhibits, and, above all, your attendance to assist in making this our 19th Annual Convention a grand one. Don't sit in your studio feeling satisfied with your efforts, but come out and join us and spend a week at one of the most beautiful spots in America, studying the exhibits gathered from all sections of the country and exchanging ideas with the many new acquaintances you will make. You will find them the most progressive, energetic, and most social set of gentlemen you have ever met. Let your appointments await your return, and, when with us, lend us your aid in preparing for an ideal Convention for 1900."

"Our association," continues the Treasurer, "should be the pride and have the support of every photographer in the land. Let's stir ourselves, take more interest in our association and contribute our mite to its sustenance. Attend our meetings occasionally and not depend wholly on our journals to place before us the benefits and advancements our Conventions alone make possible. Join with us this year in the hustle for artistic progress and you will return home enthused, feeling that you have enjoyed a week of profit and pleasure that you could ill afford to have missed." Changing names and dates, there is scarcely a line in the foregoing appeal which may not be addressed to British photographers in regard to the Convention at Gloucester next July. The exhortation which an American professional man delivers to his brethren to attend the Celoron Convention shows that they are greatly in earnest there over their annual gathering, and we trust that such a good example will not be lost on British photographers, who, besides making their own Convention a pleasant outing, can also by co-operative effort render it much more directly useful to them than it is at present.

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ACCORDING to a medical contemporary a laboratory for the application of the Röntgen rays has recently been opened in Madrid, under the name of Instituto Radiografica de España. The Institute, the installation and equipment of which are on a magnificent scale, is said to have cost some two million peretas (80,000*l.*). It is reported that the impression produced by the size of the place, the luxurious manner in which it is fitted up, and the wealth of apparatus which it contains, on the large assembly of medical men and journalists who were present at the opening, was one akin to stupefaction.

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WE are indebted to the well-informed Paris correspondent of *The Daily Telegraph* for some interesting particulars of the manner in which the French Government officially extends its patronage to photography. He tells us that the mayors in some of the out-of-the-way villages of France still have portraits of President Carnot in their offices. The Government of the Republic is determined, however, to remedy this backward state of affairs. Thirty-six thousand portraits of M. Loubet have been ordered by the State, and are to be distributed in April through all the communes in the country. It is further proposed to help the provincial mayors to complete their collections of Republican Presidents, beginning at least with M. Jules Grévy. Portraits of that former head of the State and of M. Faure are to be supplied to those mayors who want them. Nothing is said about Thiers or MacMahon, nor is M. Casimir-Perier's name mentioned in this connexion. It has been pointed out, however, that there are at the Ministry of the Interior 36,000 photographs of M. Faure's predecessor, and that these could easily be sent to the mayors' officials in question. The unused portraits had been ordered from Pierre Petit, and they were sent in before M. Casimir-Perier took the world by surprise in resigning his high post after he had held it only from June 1894 to January 1895.

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INDEPENDENTLY of the portraits of Presidents ordered by the Government, the private and trade distributions of photographs and pictures of two chief magistrates, at least, namely, Carnot and Faure, were enormous. M. Carnot, in particular,



had to compete pictorially with General Boulanger, whose presentments were everywhere. After his death M. Faure came well to the front in the same manner, and kiosks and show-windows are still full of likenesses and drawings of the late President, who is depicted in rigid official evening dress, in sporting attire, in yachting costume, in flannels for boating wear, and, finally, as a motor-man in a horseless vehicle, with a young person representing the Republic beside him. Pictures of M. Loubet are comparatively rare as yet, but they are coming on, and after the Government issue of portraits, in April, they will be nearly as numerous as the sands of the sea. Unfortunately for the lovers of variety, M. Loubet is a strictly official person, and will hardly follow the example of his predecessor, who was fond of ornamental metamorphoses in dress, which gave good scope for pictorial effects.

#### PHOTOGRAPHIC ASSISTANTS AND THEIR FUTURE.

THE letters which have appeared in our columns during the past few weeks from photographic assistants, complaining of the dearth of employment and the lowness of the salaries they are able to obtain, certainly show a very unpromising state of affairs, and it may be well to inquire as to what cause it is to be attributed. It is very evident that at the present time the photographic labour market is much overstocked and the supply exceeds the demand; that is clearly shown by the advertisement columns in our pages week by week, as the number of "situations wanted" are generally more than double those of the "situations vacant," and a not inconsiderable proportion of the latter are for apprentices with a premium, or for improvers at a nominal salary. Under these conditions, is it surprising that so many are out of employment, and that salaries are so low?

We see advertisements of first-rate operators and retouchers, who can take management of a branch, are clever with children, have had many years' experience, &c., according to the claims made, offering their services for thirty to thirty-five shillings a week. If employers can get operators with all these qualifications (!) for that sum, why should they pay more? That is the only business-like way of looking at the matter—and it is a purely business matter—unpleasant though it may be. But do all those who advertise in that way possess the qualifications they set forth? If so, the outlook is bad indeed. The employers frequently say they do not, and there is still a difficulty in obtaining suitable operators for first-class studios. Only a fortnight back we noticed an advertisement for a first-class operator to take charge of a studio, who must be well up in posing, lighting—and artistic, the salary to commence at five pounds a week. Now, it may be asked, if the advertiser could obtain a gentleman with these requirements—and they, and more, are frequently set forth in advertisements by many seeking employment at from thirty to thirty-five shillings a week—why does he offer five pounds a week "to commence with?" The answer is obvious.

We do not doubt that, in the majority of cases, those who advertise their high qualifications do honestly believe they possess them, but it does not follow that others do. Last week our friend "Cosmos" alluded to this subject. We, too, have seen numbers of letters and specimens sent by "first-class" operators in applications for appointments. The former, by the handwriting, orthography, and grammar were quite sufficient to stamp the applicants as being totally unfit to deal with the

*clientèle* of a high class studio, to say nothing of the specimens accompanying the applications. The latter the applicants clearly considered were really good, or, it is obvious, they would not have sent them. It is unfortunate that some persons seem to be quite unable to recognise shortcomings in their own productions, and that alone often leads to disappointment. Although it would seem that the really high-class labour market in photography is not much overstocked, there is no question whatever that the second, third, and fourth-rate is very much so; and the cause is not very far to seek.

In any craft, no matter what, in which a knowledge and a certain degree of proficiency is easily acquired, there is always sure to be a large surplus of labour—such is the case with present-day photography. An engineer, a carpenter or cabinet-maker, plasterer, bookbinder, printer, &c., has to toil for years before he becomes proficient in his work; not so with photography—up to a certain point. With dry plates supplied ready for exposure, with directions for their development, and with the aid of a shilling manual and a camera and lens, any intelligent man can, in a few months, nay, weeks, understand how to expose, and develop, and produce, as photographs, fairly good negatives, and do all that is expected of a dark-room assistant. Let us turn to printing. Much is now done on P.O.P. and on ready-sensitised albumen papers, both of which are now supplied with the formulæ best suited for toning them, and the shilling manual does the rest. Here, again, what great amount of skill or long experience is necessary? If the *employé* can turn out work of good appearance, that generally suits the employer, and it is, in the majority of cases, all he requires. This easily acquired proficiency is evidenced by the fact that in many, even in good second-class, studios the printing and suchlike work is done entirely by apprentices, lads, and girls.

In some cases, where a regular printer is employed, it is surprising the superficial knowledge only that he has of the work. Here is an instance. Some little while ago we received a letter from a printer, who said he had been with his present employer over two years, and had been working with P.O.P. and ready-sensitised albumen papers, but now the employer was talking of having the latter sensitised at home, and, as he had never yet done any, he asked us for a formula for making the sensitising and toning baths, as, unless he could do the work, he should lose his employment. Of course, in all such cases, we are anxious to afford every assistance, and we merely quote this case, amongst others to similar effect, as illustrating the superficial knowledge only that some assistants possess, yet they are able to keep in employment. Still one would have imagined that an *employé* would have made himself, in the time, acquainted with something more than merely using P.O.P. and ready-sensitised papers. It certainly shows lack of enterprise. Several printers who have had to take to sensitising their own paper have written, asking how the bath should be made up to strength if it got weaker, also if it could be decolourised when it got dark and stained the paper, and suchlike queries, yet these men had been filling engagements for years. In many cases, we are sorry to say, employers who have second and third-rate studios, and in some instances doing a fair trade, have no more actual knowledge of photography than the assistants they employ, and therefore are unable to enlighten them.

We have put forward the above facts, unpleasant though they be, to show the reason why so many are at present out of



employment, and the small wages paid. It may be asked, "Where is the remedy?" So long as the present state of things photographic exists, we fear the echo is, "Where!" But there is no gainsaying the fact, that the more proficient a man is in his work the better chance he has of getting employment and the better chance he stands of retaining it.

**Acetylene at Low Temperatures.**—M. Georges Claude has presented a paper to the Paris Academy of Sciences in which he recounts some singular properties of acetylene at low temperatures. He finds that a red-hot platinum wire heated by an electric current can be continuously kept in a solution of the gas in acetone at a temperature of  $-80^{\circ}$  and produces no explosive decomposition. At this low temperature acetone is at its freezing point, and is capable of dissolving as much as 2000 times its own volume of acetylene at ordinary atmospheric pressure.

**Sir W. Crookes on Monsieur and Madame Curie's Discoveries.**—As has been before described by us, these investigators have discovered a body possessing such intense radio-active properties that its results are strongly suggestive of the existence of perpetual motion. Sir William Crookes, in a paper to the above Society, gives his views upon the matter. "It can be conceived," he says, "that uranium, potassium, and iridium . . . have a mixture that enables them to throw off the slow-moving molecules of the atmosphere, while the quick-moving ones smashing on to the surface have their energy reduced while the energy of the body is correspondingly increasing. The energy thus gained seems to be employed partly . . . and partly in originating an undulation through the ether, which . . . must furnish a large contingent of light waves of short wave-length . . . Under ordinary circumstances the difference of temperature would be scarcely perceptible, and the body would then appear to perpetually emit rays of energy, with no apparent means of restoration." [In other words, perpetual motion.—EDS.]

**The New Induction Coil Contact-breaker of Wehnelt.**—We have further information on this remarkable invention in a letter to *Nature* recently, over the signature, John Macintyre, Bath-street, Glasgow. He writes of it in an equally enthusiastic manner to Mr. Swinton as lately quoted by us. The points we raised as to the necessity of control over the character of the spark for its usefulness in Röntgen-ray photography are dealt with, and it is satisfactorily shown that they can be met. "No one can doubt the great advantages of Dr. Wehnelt's instrument in reducing the time of exposure of photographic plates. . . . The question of disadvantages having been raised as to control of the instrument, destruction of tubes, &c., I made a few experiments to see how far such would affect its utility. My experiments were made with induction coils of various sizes, the largest being a twenty-eight inch spark, and in each case the principles involved seemed to be the same. Firstly, we can vary the effects by increasing or diminishing the voltage to the primary cell; secondly, the current is easily controlled by difference in proportion of the sizes of the electrodes; thirdly, the strength of the fluids in which the electrodes are immersed affects the result; fourthly, by the distance between the electrodes in the electrolyte, changes are brought about; fifthly, variations are got by the number of active electrodes. By modifying these we can vary the length of the spark, also its poignancy and thickness, and it naturally follows that we can make use of them in exciting Crookes' tubes. In fact, so easy is it to arrange matters that I have been able to excite small and large tubes of different vacua with perfect safety, even when using a twenty-eight-inch spark coil. . . . Some workers are inclined to think that large coils will no longer be required, but the answer depends entirely upon the work to be done. What we already do know is that coils of any size can do what was beyond their range in the past. . . . Photographs taken by me of deep-seated tissues in the human body have been obtained with very much shorter exposures than by any other means of interruption."

**Wood-seasoning by Electricity.**—Any method of obtaining samples of wood thoroughly seasoned and damp-proof must be valuable to the manufacturer of woodwork for photographic purposes. Every one knows the value attached to, and the price obtainable for, mahogany seasoned by years of keeping, and, if the same effect with others of additional value can be produced in a few days, or even hours, by special means, the price ought to be less and the convenience greater. Not the least valuable of the many processes brought before the public is the Norden-Bretonnean method. A large tank is prepared with an upper and lower lead plate attached respectively to the negative and positive poles of a dynamo, and the wood is placed between, the tank being filled with a solution containing borax, 10 per cent.; resin, 5; and carbonate of soda .75. The current is sent through the plates, and causes the sap to be expelled and the antiseptic solution to take its place. In from five to eight hours the process is complete, and the wood is thereupon removed and dried. Two weeks' natural drying is said to bring about an effect equal to three years' ordinary dry storage.

### VELOX FOR PROFESSIONAL WORK—VARIETY IN COLOUR.

In my previous article, it may be remembered, I referred to the many different colours that are obtainable on Velox, by simply modifying the method of working, and without having recourse to after-toning. Although a great variety of colours may be obtained by toning with different substances, I am of the opinion that it is better to obtain what is required direct in a single operation, rather than where a second, or perhaps a third, is necessary. Moreover, with simple development, we do know of what the image consists, but that is sometimes a little doubtful when the colours are obtained by an after-treatment.

During the last few weeks I have made a very considerable number of experiments with Velox, with different developers and exposures. I find that the paper may be developed with almost any of the developers used for dry plates, for negatives, or for lantern slides, though some answer better than others, so far as pleasing colours are concerned; but for pure rich black I have found nothing equal to the metol-quinone formula issued with the paper. Good red and brown colours may be obtained by using the hydro-quinone developer with a restrainer, such as that given in the ALMANAC for producing warm tones in lantern slides. I have, however, found, when using it, that the image in the shadows is liable to be more or less buried, and of a different tone from that in the lights. When, however, these pictures are viewed as transparencies, the colour is seen to be uniform throughout; but that is not what is wanted in paper pictures.

A most excellent developer for red and sepia brown tones is the M Q developer, the formula for which is sent out with the paper; for black (which I quoted in the former article), diluted, and restrained with a solution of equal parts of carbonate of ammonium and bromide of ammonium, the exposure being increased in proportion as reds or warm browns are desired. It may be mentioned, whether this developer or any other be used, that the colour of the resulting print is dependent upon the exposure given: the longer that is, the redder will be the image, and the shorter it is, the browner will be the picture. A convenient strength for a stock restrainer is:—

Bromide of ammonium . . . . .	$\frac{1}{2}$ ounce.
Carbonate of ammonia . . . . .	$\frac{1}{2}$ "
Water . . . . .	10 ounces.

As a rough guide, with an average studio negative, the combustion of about five inches of magnesium ribbon six inches from the negative, and the M Q developer diluted with an equal bulk of water, and about three drachms of the above restrainer per ounce, will yield a bright Bartolozzi red print. The development will possibly take from eight to twelve minutes. Less exposure and less restrainer will yield the sepia brown tints, and the time of development will be shorter.



The following I have found an excellent developer for reds and sepia:—

#### STOCK SOLUTION A.

Protosulphate of iron (pure).....	2½ ounces.
Water .....	20 "
Sulphuric acid .....	5 minims.

#### SOLUTION B.

Citrate of soda .....	5 ounces.
Citric acid .....	4 "
Water .....	20 "

If, in a few minutes after the addition of the sulphuric acid to the A solution, it remains turbid, with a reddish tint, it shows that the crystals of the sulphate were somewhat oxidised, in which case a few drops more of the acid should be added till the solution is clear and becomes of a very pale apple-green tint; but no more than is really necessary should be used. For use, add one part of A to two parts of B. With this developer less exposure will be required for the red colours than with the M Q. Three or four inches of ribbon will generally suffice, and, for browns, less. The image comes out red at first, and then passes on to the browns if the development is continued. The proportion of acid to the citrate can be varied within some limits, and the citrate of potash may be substituted for the soda salt, though I prefer the formula as given above, notwithstanding that the potash gives a more purple tint to the image. The fixing solution is the same as that given in the formula for the paper for the black tones.

I should have mentioned before this that, for obtaining red and brown colours, the Velox paper should be employed. In the preceding article I recommended, for professional work, the special Velox, but that was for the black tones. For the colours I advise both professionals and amateurs to use the ordinary, as I find that it gives more vigorous results than the special. With the latter the colour in the shadows seems to be too much buried in the film. There are three grades of the ordinary paper—"glossy," "rough," and "carbon." The last-named, by reason of its surface, and the colours it yields, very closely resemble veritable carbon red chalks and sepia. The first-named (the glossy), particularly when the potash citrate is used in place of the soda salt, gives prints very like those on the ordinary P.O.P. I have obtained good browns with the usual pyro-ammonia and the pyro-soda developers, though better with the latter than the former. But I much prefer the M Q, or the iron formulae as given above. I may be asked which of these two I like best? For the browns I prefer the restrained M Q, and, for the reds, the iron, because with the former the browns are quickly obtained, and the reds require a longer development; whereas with the iron the reds come out at once, while the browns require a prolonged development, though with the prolonged development, in either case, several prints may be developing at the same time. The resulting colours, with either of these developers, are much the same in the end.

In professional photography uniformity is essential, as it does not do to issue a dozen, say, of cabinet pictures, all of different tints. Now, uniform results can only be secured by uniform exposure, whatever developer be used. With the ordinary Velox, the exposure to gas to obtain the reds would have to be very long. Daylight, though otherwise good for the purpose, is very inconstant, and would frequently lead to waste of paper. For these reasons I should advise magnesium ribbon, burned at a fixed distance from the negative, as the source of light, and that is what I have used myself—thus we can, practically, measure our light by the inch. My method is this: Nail a lath on the work-bench, say six or eight inches from its edge, against which the printing frame is placed, standing on its side. Now have a piece of stick with a split at the end, into which the magnesium ribbon can be inserted at a right angle. The ribbon is lighted with a spirit lamp, or with a match, and then moved while the combustion lasts. By moving the stick to and fro along the edge of the bench, which serves as a guide, the light is always kept at a constant distance from the negative. During the burning of the magnesium it is well not to breathe on it or let a draught reach it, so that the smoke is not wafted between the frame and the negative, as that might cause inequality in the exposure.

Too much stress cannot be laid on the necessity of uniform exposure, for upon that the colour—whether the various shades of red, sepia, brown, &c.—is dependent, and I hope I shall not be thought dogmatic on this point. I would strongly advise those who work for colours, for the first time, to make the following simple experiment, and the time will not be wasted. Make, say, five small prints from the same negative, giving the first an exposure of one inch of ribbon, the second two inches, and so on, the fifth getting five inches. Then, after moistening the prints in water, put them all at once into a dish of the iron developer, keeping them moving about, and note the result. The longest exposed will come out rapidly of a bright red colour, and the detail in the light will quickly appear. The next print will be a little longer in coming out, and by the time all the detail is out it will be a less bright red than the previous one, and so on. Although all the images are red when they first appear, those with the shorter exposure, and longer development to obtain the detail, become browner and browner before that is secured, yet all may be good prints in the end, though of different colours. In a word, it may be said that the more work the light has done, and the less the developer has to do, the redder will be the image; and, conversely, the less the light does, and the more the developer has to do, the browner will be the finished picture; and this holds good whatever developer be employed. It may be as well to mention that, in practice, it will be found that the brown prints dry up somewhat darker than they appear in the developer, while the red maintain about the same depth, except that they have a less yellow tone when dry.

In the many experiments I have made with Velox, I have met with some curious results (by the addition of different substances to the developer) in modifying colour, amongst which I may mention sulphate of copper. This, by itself, and the citrates, seems to have no developing action, but when added to the iron developer it acts as a powerful accelerator, and modifies the colour greatly, making an image, that would otherwise be bright red, a cold greenish brown, while at the same time it appears to add to the brilliancy of the lights. From ten to twenty minims of a 10 per cent. solution to the ounce of developer has a very marked effect. Most of the results I have obtained in this direction, though interesting to the experimentalist, I have not found to be of any real practical value to professional photographers, therefore I will not trespass on space to describe them.

E. W. FOXLEE.

#### ON DRY PLATES AND THEIR MANUFACTURE.

SINCE the introduction of the gelatine dry plate in 1877-78 an innumerable number of greater and smaller advances have been made, says Herr Vollenbruch in the *Deutsche Photographen Zeitung*. The higher sensitiveness of the dry plates over the wet-collodion plates has made photography a great labour-saver in all kinds of business. As great as has been the advance in the use of dry plates, the preparation of the same stands practically in the same position as it did twenty years ago. The emulsion is made by mixing solutions, which principally contain a bromide, silver nitrate, and gelatine, and then, by subsequent boiling or long digestion of the mixture by heat, generally with the aid of ammonia in order to hasten the ripening. Then subsequently follows the washing of the set emulsion, in order to remove the excess of salt and the products of the double decomposition.

Attempts have frequently been made to replace the troublesome digestion and the boiling by other methods; thus, in 1882, by Burton, and in 1885 by Henderson, whose process is generally used as follows: In a vessel which will hold about 2 litres are placed 4 grammes of hard gelatine, and this is allowed to soak in 150 c. c. of water, and then melted on a water bath, and 5 grammes of ammonium carbonate are added, and then 45 grammes of ammonium bromide, 6 c. c. of a ten per cent. solution of potassium iodide, and 20 c. c. of liquid ammonia (sp. gr. .91), and finally 400 c. c. of alcohol, and the whole allowed to cool. In another bottle are dissolved 60 grammes of silver nitrate in 300 c. c. of water.

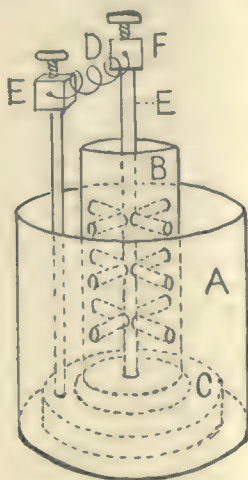
In the dark room the two solutions are mixed cold, and the emulsion shaken in a well-closed bottle very frequently for three or four hours. It is then allowed to stand, at an ordinary temperature of about 14° C. for about ten hours. Then 80 grammes of hard gelatine and 20 grammes of soft gelatine are allowed to soak in water, and then freed from excess of water by squeezing, and then the gelatine is melted, and



then poured into the warmed emulsion very slowly and with constant stirring. The emulsion is then allowed to set, and washed for twelve or fourteen hours in running water, and the further treatment is the same as with every other emulsion.

The author states that he has found that the action of electricity in the preparation of such emulsions is extremely simple and gives plates of quite wonderful qualities. The plates prepared with this emulsion possess a delicacy and brilliancy which is to be found in no other plate in the market, and negatives are obtained on them which have all the characteristics of a wet plate; they are absolutely clear and of very high sensitiveness, and surpass even the best transparency plate in fineness of grain.

For the preparation of these emulsions I use a special apparatus, consisting of a large, wide glass or porcelain vessel. On the bottom of the vessel lies a round sheet of lead, 5 centimetres thick, which is connected by a screw and solder with an upright copper wire. This copper wire is provided at its upper end with a binding screw. Beyond this, on a 5 cm. high ebonite foot, is a zinc cylinder, which is platinised inside, and the two are so connected that they make a water-tight vessel. Into the middle of the bottom of this vessel is screwed a silver wire, which is provided on all sides with short arms; this also carries a binding screw. If it is desired now to connect up the electric element, the sheet of lead is laid first at the bottom of the outer vessel. On this lead plate, and in the middle of the vessel, is placed the zinc vessel with the



ebonite bottom, in which is the silver wire, the arms of which should nearly touch the sides of the vessel; there ought to be about 5 mm. distance between the ends of the arms and the sides of the vessel. The binding screws on the silver wire should now be connected by a copper wire with that of the lead plate. This is the necessary apparatus to make the emulsion sensitive, and the diagram explains itself. The arrangement of the apparatus may be such that the battery is separate; in such a case a binding screw should be affixed to the edge of the zinc cylinder, B, and the cylinder may be of any metal, but it must be platinised inside. The negative wire from the battery must then be connected with the cylinder, B, the positive with the silver wire, A.

The process is, briefly, as follows: The gelatine is swollen in water, then melted, and finally mixed with resin dissolved by means of alkali in water, then mixed with a solution of silver nitrate in water, and allowed to set. When set, the silver jelly is broken up and placed in the zinc vessel, B. When filling this vessel, it must be shaken so as to make the particles of jelly settle down to the bottom between the arms of the silver wire, and so that the vessel is evenly filled up to about two-thirds of its height.

The vessel, B, is now placed in position in the vessel, A, so that it stands on the lead plate, C. The outer vessel, A, is now filled up to within 2 cm. of the edge with a solution of magnesium sulphate of a certain strength. Then pieces of sulphate of copper about the size of a hazel nut are thrown in, and the two binding screws, F, F, connected by the copper wire, D, by means of which the very constant electric circuit will be closed.

Now the zinc vessel, B, is filled with a solution of an alkaline bromide which contains two per cent. of its total weight of ammonium chloride. After the lapse of a certain time, the silver in the jelly will be converted

into finely divided silver bromide. The emulsion thus formed is now washed, and the further treatment is as usual.

The duration of the action of the electric current naturally has a very great effect on the sensitiveness; the longer this acts the more sensitive is the emulsion. The strength of the current is also of considerable influence on the formation of the grain and the sensitiveness.

By a small modification of the proportions of the ingredients, I obtained an emulsion which gives absolutely grainless and transparent plates, and of which the sensitiveness is proportionately high. With these plates I have taken photographs in natural colours with short exposures; for instance, a portrait in a studio in a good light taken with a Busch portrait lens with medium stop with four seconds' exposure. The image showed a reproduction of colours corresponding to the original, and the colours were of extraordinary brilliancy and delicacy.

It is very advantageous to be able to do without the mercury dark slide for such work, and to use instead a card, with a thin, polished silver leaf fastened to it as a support for the emulsion. Such cards may be easily prepared by taking a smooth polished card of suitable size, and dusting the same equally all over with resin, in an extremely finely divided powder. On this is laid a real silver leaf of 0.05–0.1 mm. thickness, and passing the two through a well-heated double rolling machine. The passing through must be evenly done, and the dusting on of the resin must be very carefully done and regular and not too thick. The silver leaf should be carefully polished with spirit and the finest levigated chalk, and then carefully cleaned.

To expose these cards the ordinary slide can be used if a sheet of glass be placed in front of the dark slide and another behind the card, and the necessary allowance be made for the thickness of the glass in focussing.

#### COLOUR-SENSITISING PLATES.\*

*Solidblau NG* gives a curve of the Nigrosine type, that is to say, with a weak bath, a band from C—D, and a weaker band D—D½ E; with stronger baths the bands become narrower and a distinct minimum showed itself about D. The action, if only faint, extends to A.

*Chromlederblau B'* gives a curve of the Indulin type; a band from B—D, falling quickly at D and a strong band D—D½ F.

*Chromlederbraun 3 B* gives, with very strong baths, a very faint band from B—C.

*Lederbraun R* sensitises equally from F—D, but not very strongly even with short exposures.

*Benzoflavin II*, an acridine dye, sensitises very strongly. The band from the violet to E is continuous, with a faint maximum from E—F. With weak baths the sensitising is quite equal. This dye ought to be of some practical value, but it has no advantage over acridine orange NO (Leonhardt & Co.), it appears also to slightly lower the sensitiveness, especially with strong baths.

*Phenylenblau R* gives with long exposure a band from A—C, falling quickly, the maximum lying about B. The plates are foggy and give irregular reduction.

*Echtgrau B* and *Echtgrau R* gives very foggy plates and the dye partly separates out in the baths. A faint band at C is visible.

8 KALLE & Co., BIEBRICH.

*Diazingrün*, *diazinbraun*, *diazinschwarz* lower the sensitiveness of the plates in an extraordinary way; even with long exposures no action was visible.

*Diazinblau BR* is a very vigorous sensitiser, which acts in very minute quantities. The sensitiveness is lowered. The band reaches from A almost to D with a vigorous maximum from B—C½ D. A strong addition of alcohol to the bath is required or else part of the dye separates out. There is a tendency to fog.

*Brilliant diazinblau B*. The same remarks as above apply to this dye, only the curve begins at A and reaches to C½ D and the maximum is from A—C.

*Biebericher Patentschwarz RO* and *AN* give no action.

*Tolanroth*, *Rosindulin 2 B*, *Biebericher Indigo B* gave the same results as previously described by Valenta.

*Biebericher Indigo R* gives a weak band B—C with a stronger band D—D½ E, both of which appear with fairly short exposure.

*Naphtamingelb G*, *naphtaminorange R*, *naphtamin orange 2 R* gave no action.

*Naphtaminbraun O B* sensitises very vigorously, F—E.

*Naphtaminblau 3 R*, a weak band C—D.

\* Continued from page 117.



*Naphthaninblau 5 B*, a very vigorous band B—C, visible even with short exposures. With a very weak bath the band extends to C $\frac{1}{2}$ D. Much alcohol entirely stops the sensitising.

*Salicigeb* sensitises weakly to D.

*Chromin G* acts even with short exposures to D, but not very vigorously. At D the band breaks sharp off.

*Directgelb G* is without action.

*Directscharlach G* gives a fairly vigorous band to D, and *Directscharlach B* gives a vigorous band from F $\frac{1}{2}$ D, both with short exposures.

*Indulin R*, weak band, falling from A—D, and a stronger band D—D $\frac{1}{2}$ E.

*Indulin B* acts from A, a vigorous maximum B—D $\frac{1}{2}$ E.

*Nigrosin 3 B*, an extremely vigorous band C—D, with narrow minimum at D, a weaker band D—D $\frac{1}{2}$ E. Great concentration of the baths narrows and weakens the bands.

*Nigrosin R* acts from A, a vigorous maximum C—D, with a somewhat weaker maximum D—D $\frac{1}{2}$ E. The action extends with long exposure right into the infra red.

*Nigrosin F B C grau* acts in almost the same way as the previous dye, but not so strongly.

It is to be regretted that the nigrosines only give useful results with long exposures, as otherwise they belong to a class of dyes which give excellent colour sensitiveness with perfect freedom from fog and a vigorous deposit.

### THE RELATION OF PHOTOGRAPHY TO ART.

(Bronze Medal Paper read before the Edinburgh Photographic Society.)

In choosing for a subject the relation of Photography to Art one feels that he labours under the great disadvantage of coming after a host of others who have written on the same theme. To most who read the current literature of photography it must seem a field reaped and gleaned to the last straw, and they are, doubtless, weary of the apparently interminable, stale, and oft-repeated platitudes that are constantly to be met with. Yet the subject is a very wide one, and it is in the hope that I may be able to adduce something not altogether trite that I venture to make the following observations and suggestions. There is so much "special pleading" in debatable subjects such as this, that one who wishes to write to any purpose must, so to speak, scourge himself into an attitude of impartiality. It is easy to write in the contemptuous manner of many art critics who deny the art claims of photography, and it is so easy to take up the spread-eagle style which characterises certain writers in the photographic journals and claim too much. Perhaps what one feels most strongly in this, as in most other subjects on which opinion and feeling differ, is, that there is an element of right on both sides and that the most important function of any writer is to endeavour to discover the position of the medial line of truth, and to show that in some cases the conflict may be more apparent than real, and in others that there is no necessity for conflict at all.

At the outset, it must be admitted frankly, fully, and without reservation, that the best work of the artist of genius is far superior in almost all essentially valuable qualities to anything yet achieved by the photographer, and, it may be added, to anything that in the future any possible discovery, even the mastery over colour, will enable him to achieve. Yet, after all this has been admitted, photography is valuable—is of very high value, not only in its scientific and merely recording aspects, but as a means of securing those subtle and rare qualities which the artist strives to gain. It was for long the reproach of photography that it could not render what are called "effects." That it is difficult to render in a photograph the rarest, most delicate, and most exquisite of the phenomena of light and atmosphere is true—that it is impossible to secure many of the finest of these effects is not true. But, in order to the highest attainments in this direction, there must first be in the photographer the capacity to see and to feel these things, and also the knowledge of processes and methods by which the tenderest, as well as the most powerful effects may be produced. There can be no doubt that, as time goes on, higher and still higher qualities are demanded in all work that aims at distinction. It is now clearly enough seen that there are two separate, and to some extent conflicting, uses to which photography may be put—the record of what may be called abstract facts for scientific purposes, and the record of beautiful facts for artistic purposes—the one appealing in greatest measure to the intellect; the other, similarly, to the affections. And with the recognition of these two distinct uses all the old mechanical rules are being relaxed, nay, even abandoned, and liberty of practice is claimed and admitted in all directions, a completely satisfactory result justifying in every case the means taken to produce it.

One of the first and most important things the photographer must learn is that nature does not strew her pearls broadcast. The most precious things must be keenly looked for, patiently waited for, and taken advantage of promptly. It almost seems as if we can never get a second chance to secure the finest things. The light changes, and the charm which has endured but for a few moments has gone for ever. Who that has not sketched or photographed realises how quickly the apparently

inert and motionless cloud changes both its position and characteristics? One sees, for instance, a strikingly magnificent cumulus cloud, but, before his apparatus is ready, the grand and unique has become poor and commonplace. Again, the most delightful scenes are the most rare. One reach of the river far surpasses all the rest; in only one nook of the forest, and only one corner of the lake, is the distinctive charm of each attained in highest perfection. The finest and most characteristic specimens of all things are rare and ill to find. We must, therefore, not expect to get the very best things every time we go forth with a camera. It is a mistake to suppose that first-rate pictures can be got by the dozen. Nature is rich, but she has not got such a number of perfect gifts to bestow as many seem to think. Yet, though we cannot get pictures so frequently as we desire, we may find subjects for pictures every day we are abroad, which are to be kept in mind and taken advantage of in suitable conditions of light and atmosphere. To lose a day of grand clouds is a loss indeed. It has been said that in art nothing short of the best can satisfy, therefore no pains should be spared to get perfect work. It is possible even to make certain small artificial improvements on the foreground of a scene which are highly important in the result, but this cannot be done without great care, for the camera is a merciless exposé of incapacity in every direction. Perhaps there is nothing in which skill is more essential than in the introduction of figures into a landscape; and not only is skill necessary, but patience as well. The cost is great, but the gain is correspondingly great. He who would extend his appreciation of all that is striking and beautiful in nature, who would produce work instinct with the finest feelings, would do well to take assistance from the poets. In the pages of Wordsworth and Tennyson, of Longfellow and Whittier, and in many other modern poets, the most exquisite word pictures of natural scenery are to be found, and the characteristics and charms they depict so beautifully and so vividly in words are just of the kind that the photographer requires to look for and to render. Truly there is scope in photography for the highest talent and the greatest industry.

I now wish to offer one or two practical suggestions for increasing the artistic value of photographs, but in doing so I feel a certain diffidence, because I have not been able so completely as I could wish to test the methods I advance. Still the experiments I have made appear to me to be satisfactory. My suggestions may not be altogether new, but I have not noticed them pressed as a means of improving negatives. They are certainly not in common use, and many photographs suffer from the defects they mean to remedy.

The chief suggestion is, that an original negative should be made technically perfect, absolutely sharp, in no part destitute of detail, or, at all events, of gradation, and having as nearly as possible the full range of natural light. From this primary negative a positive transparency should be made, and from that in turn a secondary printing negative is prepared, which may be either the same size, or larger or smaller than the original. The object and advantage of this apparently roundabout process is to enable us to produce a negative of exactly the character required, so that in printing from it no local development or special treatment of the prints would be necessary. It is, no doubt, possible to modify the original negative, and it is desirable to do so as far as practicable, not by reducing or intensifying after-development, but preferably by controlling the action of the developer on different parts of the plate so as to produce the desired result; but any attempt to produce a perfect negative at one operation is, for many subjects, likely to be more or less unsatisfactory. Even if one could tell in the initial stages what changes were really necessary, the extreme variations of treatment on the different parts of the plate, and the extended time of development, would be almost certain to produce markings and other defects that would go far to spoil the negative. The use of a derived negative gives three stages to get at what is wanted, and this must be an undoubted advantage in the process of modifying and harmonising the lights and shadows, &c., and in reducing the wide scale of the original negative to the more limited scale available for a print to be viewed on an opaque surface, as of paper. The result is that the sky is brought up to the requisite pictorial strength, a due amount of lighting is given to the rest of the picture, and the exact degree of force or delicacy aimed at may be ensured. The detail and massing of light and shadow is distributed as desired, sharpness of focus and hardness of line are subdued when necessary, and the whole negative is brought to such a satisfactory state that a succession of similar prints of a particular character could be obtained from it without much, if any, individual or special treatment. It would not be desirable to follow such a course in the case of every negative; but, when the subject is very good, and when there is a fine natural sky, neither time nor trouble should be spared to attain the best result. This method should be far preferable to printing in clouds from stock negatives. It has been truly said that in art nothing short of the best can satisfy.

There ought to be the greatest possible variety in the size, shape, and tone of photographs. The less we speak of whole-plate, half-plate, quarter-plate prints, of sepia, black, and purple tones, the better. It ought, perhaps, to be somewhat of a count against a picture to describe it as a half-plate silver print of a purple tone; not because such characteristics are bad in themselves, but because they are the characteristics of such a vast number, and variety is all-important in pictorial



work. The tones of photographs, especially when of moderately large size, admit of far greater variety than is commonly supposed, and that without going outside the range of colour generally considered admissible.

The scale of the picture is also a point of considerable importance. A really fine and well-balanced picture is generally improved by being enlarged to some extent if originally of one of the smaller sizes. It is not possible to lay down hard-and-fast lines on this point, but it is well worth consideration in each individual case.

The quality and suitability of frame is also deserving of attention. It is hardly possible that a picture can appear to be of value if the frame in which it is set speaks of cheapness, flimsiness, and poor workmanship. The most suitable tone, or tones, for the frame of a particular picture are, of course, best arrived at in an experimental manner.

It is desirable to say something on the subject of the criticism of photographs. It is to be feared that much of the criticism we read and hear is based on very superficial knowledge. In an hour's time almost the points that engage the attention of the average critic can be acquired by any one. A few empirical rules as to composition, the position of the leading object, the disposition of the principal lines, opposition of horizontal to vertical, straight line to curve, and a few superficial notions as to the production of sentiment, are too frequently the whole stock in trade of many who pretend to critical skill. Such a person may quite easily point out small blemishes or defects, but, if he has not studied both art and nature long and patiently, he cannot discover good qualities which far outweigh the petty deficiencies he can so quickly discover. As a matter of fact, no photograph of any consequence has ever been, or ever will be, taken, in which the numerous little discords of nature (if such they may be called) do not appear, and it is absurd to lay much stress on them. Besides, it must be remembered that there is a harmony that cannot be seen, but only *felt* to exist. It is not alone the "elevation," so to speak, that must be harmonious; the "ground plan" and every conceivable "section" of a picture must be *felt* to be harmonious, even when the harmony cannot be directly seen. Again, *surfaces*, as well as lines, must be *felt* to have beautiful curvature, and where are the recipes and formulæ that can confer keen perception and fine feeling for all the phenomena that exist in the infinite domain of nature?

If the highly skilled painter, by taking advantage of the selection of materials for his picture, by the use of colour, and by the various kinds of suggestions that he can obtain from the endless methods of applying pigment, can reach heights of excellence impossible to the photographer, yet his scope is, either from necessity or choice, far more limited. It is unquestionably the case that artists, as a class, are prone to notice only those effects that have been painted over and over again. Without presuming to make a comparison on general grounds, one cannot help feeling that, at every exhibition of photographs and lantern slides, he sees a greater number of fresh and striking aspects of nature depicted than in the average exhibition of paintings. This freshness is particularly noticed in photographs of sea and sky, which often also give such force of presentation as no painting can rival. The surface of water, nature's own mirror and kaleidoscope, is ever changing and ever beautiful. How vast the change from the still evening lake, whose inverted world is tremulous with myriad needles of reflected light, to the storm-tossed sea when the waves, crowned with spray and wreathed with foam, surge around the giant boulders of a rock-bound coast. Again, how vast and varied are the glories of cloudland, from peaceful flocks of sunset cloud to those majestic piles of lurid vapour where the powers of the air are imprisoned. In all these phases of natural loveliness or majesty, and in all that lie between, the camera has revealed undreamt-of visions of beauty, so rare and so elusive that through the centuries they had remained invisible to the painter's eye.

Let it not be supposed that pictures of those works of the Creator that we esteem beautiful are valueless because they are self-portrayed by means of the light by which our eyes see them, and that only those pictures are to be prized that present nature as modified by some one who chooses to call himself an artist. Such an idea, common as it is, can surely not bear to be plainly stated. It should be remembered that the action of the artist is not pure gain. Indeed, in the case of inferior artists, it is not seldom pure loss, for they give us either nature as if out of a mud bath, or arrayed in a gaudy, meretricious garb, rarely in the modest and pleasing colour which is her delight; and, at the best, how often do they give us merely the *complexion* of nature, despising form and almost all that speaks of vital forces. It is with strange feelings one hears such artists, as if from some sublime elevation, speaking patronisingly of photography, and in utter magnanimity deigning to be kind, when they might justly be severe. But, after all, why should photographers care much whether the quality of art be or be not attributed by artists to their work? Its power to confer instruction and delight is just the same, although this little word of three letters is unheard of in connexion with it.

I cannot see that an earnest and successful worker in photography has any cause to feel ashamed of his choice of a pursuit. For one whose time and energies are mainly occupied in the daily work by which his livelihood is obtained, to photograph is, in the great majority of cases, a more honourable, because more wise, choice than to paint from nature. The time at the command of most amateurs is quite sufficient

to gain the requisite manipulative skill and to provide the opportunity for doing successful photographic work; but the amateur painter cannot hope to produce tolerable, far less admirable, work, unless he is decidedly gifted, possessed of exclusive devotion to his work, has more than the average share of leisure, and the advantage of some professional tuition as well—a combination of circumstances rarely to be met with.

Photography carries with it most of the advantages that other recreations possess—open air, exercise, emulation if desired; but, distinctively, and in largest measure, it has an educative influence of the most delightful and varied kind, and it keeps ever fresh those reminiscences of happy days and distant scenes which might otherwise have completely faded with lapse of years from the pictured page of memory. Let the photographer be proud and glad of the extent, variety, and richness of the field of his labour, and, if he cannot, like the painter, transfigure nature according to his individual fancy, or distort her after his caprice, let him rejoice that he is more likely to display the beauty that the Creator intended to be seen, admired, and enjoyed by all.

JAMES CRAIG.

## ADUROL AS A DEVELOPER FOR NEGATIVES.

[Report by Mr. C. H. Bothamley, F.I.C., F.C.S.]

I HAVE investigated the developing powers of a specimen of adurol received from Messrs. A. & M. Zimmermann. It was enclosed in the original cardboard packet bearing the name of E. Schering & Co.

Adurol is a white semi-crystalline powder which dissolves fairly easily in water and more readily in solutions of sodium sulphite and potassium metabisulphite. A thin layer of the solid substance was left on a glass plate in free contact with the air for more than a fortnight, but at the end of that time it showed no discolouration, and had not in any way altered in appearance. An aqueous solution exposed in a dish to the action of air for a fortnight acquired only a slight brown colour without formation of any precipitate; a solution in a ten per cent. solution of ordinary sodium sulphite under the same conditions became pale yellow only, whilst a solution in a ten per cent. potassium metabisulphite solution remained quite colourless.

It follows from these observations that adurol undergoes little or no recognisable alteration when exposed to the air under conditions more severe than would be met with in actual practice. It is even less liable than hydroquinone to discolour through the action of air, whether in the solid state or in solution.

Two formulæ are recommended by the makers; one for a concentrated solution containing both adurol and the alkali, whilst the other is far more dilute and separate solutions of the adurol and the alkali. They are as follows:—

### I.—CONCENTRATED MIXED SOLUTION.

Water .....	400 parts or 7 ounces.
Sodium sulphite .....	75 " " 1½ "
Potassium carbonate .....	150 " " 2½ "
Adurol .....	15 " " ¼ ounce.

For use, dilute with from five to seven times its volume of water.

### II.—SEPARATE SOLUTION.

#### A.—Adurol.

Water .....	500 parts or 16 ounces.
Sodium sulphite .....	50 " " 750 grains.
Adurol .....	10 " " 150 "

#### B.—Alkali.

Water .....	500 parts or 16 ounces.
Potassium carbonate .....	60 " " 900 grains.

For use mix in equal volumes.

I have made experiments with several different brands of plates typical of those in use in this country and find that adurol acts in a very satisfactory manner with all of them, working fairly rapidly and yielding negatives of excellent vigour and gradation and of a good black colour.

It is immaterial whether the first or second formula is used; the only difference observed is a slight difference in the rate of action, due to the difference in the strengths of the solutions. Diluting the developer, in fact, affords a useful means of controlling its action.

The image, with a normal exposure, begins to appear in from thirty to forty seconds and builds up gradually, in much the same manner as with pyrogallol. Development is complete in from three to four minutes. It is noteworthy that the developer works with very fair rapidity and gives sufficient opacity, even when comparatively cold.

There is no tendency to produce stains and almost no tendency to produce fog, except perhaps in the case of very rapid plates, and the tendency is readily checked by addition of a small quantity of potassium bromide.

Potassium bromide in the developer has a very marked restraining effect, and gives distinctly increased printing contact in the negative if development is not pushed to the limit. By the use of bromide, development can be kept under control, even when there has been considerable



over-exposure. Half a grain of potassium bromide per ounce of mixed developer exerts a marked effect, and with one grain per ounce development becomes rather slow, though not so slow as with hydroquinone under similar conditions.

The same quantity of developer can be used for several plates in succession, its action, of course, becoming gradually slower.

Even when the developer is left in the dish for half an hour after being used for the first time, the diminution in its developing power, though distinct, is not very strongly marked.

I find that adurol can be used with sodium carbonate with very good results. The adurol solution given under formula II., when mixed with an equal volume of a ten per cent. solution of soda crystals, forms a developer that acts somewhat more slowly than when potassium carbonate is used, but nevertheless acts quickly enough for all practical purposes. Potassium bromide in this developer has a distinct restraining effect without making the development so tediously slow as with hydroquinone under similar conditions. Adurol soda with potassium bromide, not exceeding one grain per ounce, is, in fact, a very useful developer for dealing with over-exposed plates or with normally exposed line subjects.

If the proportion of adurol is reduced whilst that of alkali is increased, e.g., one volume of adurol solution and three volumes of alkali solution, the effects are similar to those observed with pyrogallol; the appearance of the detail is relatively accelerated, whilst the growth of opacity in the high lights is retarded, the result being that, unless development is pushed to its utmost limit, the printing contrasts of the negative are distinctly reduced. There is, therefore, some power of correcting for moderate under-exposure.

Speaking generally, I find that the claims made for adurol are well founded. It is a developer that combines the cleanliness, freedom from stain and fog, with the power of giving vigorous negatives, that characterise hydroquinone, whilst at the same time its rapidity of action is practically equal to that of pyrogallol. It also has the great advantage over hydroquinone that the use of caustic alkalies is unnecessary, since, with potassium carbonate, and even with sodium carbonate, development is quite sufficiently rapid to meet all requirements.

It follows that adurol is a developer of very considerable value for general work, and it also promises remarkably well as a developer for line subjects.

#### ON HYDROGEN PEROXIDE AS THE ACTIVE AGENT IN PRODUCING PICTURES ON A PHOTOGRAPHIC PLATE IN THE DARK.

[A Paper read before the Royal Society, March 2, 1899, and reprinted from *The Chemical News*.]

In previous papers it has been shown that certain bodies are able, in the dark, to act on a photographic plate and produce a picture. The purpose of the present communication is to show that, in all the cases which have been examined, and probably in all others of a similar kind, the action which occurs is due to the presence of hydrogen peroxide. As a sensitive plate always contains moisture, and probably would be inactive if quite dry, it does not seem possible to test the truth of this statement by the total exclusion of moisture; therefore more indirect means have to be adopted. In the following paper no attempt is made to explain the reactions which occur in the plate itself; that is a distinct question, and at present the object is to consider the means by which these changes, whatever they may be, are brought about. These changes are rendered visible by exactly the same processes as those adopted for the development of an ordinary light picture. Any of the ordinary photographic plates may be used in these experiments; but, as many of the pictures are only formed after a long exposure, it is well to use rapid plates. In the following experiments the plate used has been in almost all cases the Ilford special rapid, and the process of development has in every case been that recommended for their ordinary use.

The first step towards demonstrating that hydrogen peroxide is the active agent in producing these pictures is to show that all the results produced both by metals and by organic bodies on a photographic plate can be produced by hydrogen peroxide. This body is now made in considerable quantities and sold in aqueous solution of a given strength. This commercial article appears to act equally well to a carefully prepared and pure specimen of the same strength.

A convenient way of testing the action of any liquid on a photographic plate is to use a small circular glass dish, such as is made for bacteriological experiments, the photographic plate resting on the top of the dish, and the amount of the liquid used determines the distance the plate is from the active surface, the experiment being carried on in complete darkness. If pure water be tested in this way, it is found that no picture, that is, no darkening of the plate, occurs on its being treated with the developing solution. The plate can be left over the water for eighteen to twenty hours, but, if left longer than this, the film is destroyed by the aqueous vapour. If to the pure water in the dish a mere trace of hydrogen peroxide be added, a darkening of the plate will quickly occur.

For instance, if the liquid contains only one part of the peroxide in a million of water, and the plate be exposed to its action for eighteen hours, a faint picture is produced. Bearing in mind the small amount of

evaporation which takes place under these conditions, and consequently the minute amount of the peroxide which comes in contact with the plate, it clearly shows the exceeding delicacy of the action.

Again, if a piece of Ford blotting-paper, which by itself is inactive, be wetted with a solution of one part of peroxide in 500,000 of water, and be hung up in a warm room for three-quarters of an hour to dry, and placed in contact with a photographic plate for two hours at a temperature of 55° C., on subjecting the plate to development a distinct picture is produced. In fact, moistening good blotting-paper with a solution which may be strong or weak, and allowing it to dry for a long or short time, is a very good way of applying the peroxide. In place of blotting-paper any inactive porous substance may be used.

Plaster of Paris wetted with a peroxide solution and allowed to set continues for a long time to be an active body. If by any of these means a large, in place of a small, amount of the peroxide be allowed to act on a plate, then, in place of a dark, a light picture is obtained, a phenomenon similar to what is known to photographers as reversal.

The conditions under which certain metals and certain organic bodies act on photographic plates, and how pictures of the structure of paper, skeleton leaves, lace, and other bodies can be obtained, has already been described, so that now it is only necessary to say that substitute for these active bodies peroxide of hydrogen and exactly corresponding results are produced. Writing with ordinary ink, or with a solution of ferric sulphate, or potassium ferrocyanide, has been shown to be opaque to the action of zinc and of turpentine, so is it to the action of the peroxide of hydrogen. Further, the action exerted by the metals and the terpenes is unable to pass through glass, mica, selenite, &c., but is able to pass through thin sheets of gelatine, celluloid, gutta percha, indiarubber, tracing paper, gold-beaters' skin, parchment, &c.; peroxide of hydrogen acts exactly in the same way, every body which is known to be either opaque or transparent to the action of the metals or terpenes is opaque or transparent to the action of the peroxide, so that, as far as the production of similar phenomena goes, the agreement is complete. Of the acknowledged tests for the presence of hydrogen peroxide, the one with the titanous acid dissolved in sulphuric acid is exceedingly delicate; so also appears to be the tetra-methyl-paraphenyl-enediamine paper of Dr. Wurster, and both of them have been made use of.

The next point which naturally suggests itself is, whether peroxide of hydrogen is, or is likely to be, present in all the different cases, when action on the sensitive plate occurs. First, with regard to the metals. The list of the active metals, which has already been given, is as follows, arranged approximately in order of their activity: Magnesium, cadmium, zinc, nickel, aluminium, lead, cobalt, bismuth, tin. Now, these are certainly the metals which might be expected to decompose water, and in the presence of oxygen cause the formation of hydrogen peroxide, and still more the order in which they stand in the above list, judging from their general properties, is that in which they would probably induce the formation of the peroxide. It is also satisfactory to note that this list of metals and their order of activity was drawn up simply from experiment, when there was no idea that hydrogen peroxide had anything to do with the reaction. Again, as a confirmation that hydrogen peroxide is formed when these metals oxidise in moist air, pieces of Dr. Wurster's tetra paper were moistened and laid on bright surfaces of the metal. With the metals that head the foregoing list a considerable amount of blue colour was rapidly developed; with the metals at the end of the list the amount of colour was less, and the reaction slower; and with other metals, such as silver and platinum, there was no action. With copper and with iron a very slight amount of action did occur, but these metals do not appear able to produce definite pictures. Iodide of potassium and starch paper, where used in the same way, gave a blue colour with all the active metals, but none with copper nor with iron.

On the supposition that hydrogen peroxide is the active agent in the action exerted by the metals, it seemed probable that, on supplying to the metal more moisture than it obtained from the air and photographic plate, more action would take place, and this was found to be the case. Two pieces of polished zinc were placed in contact with photographic plates in small iron boxes; one box was quite dry, and put in a bell jar over calcium chloride, and into the other box some damp paper was introduced, and the box was placed with a little water under a bell jar. On examining the plates after three days, it was found that the damp plate had much the darker picture on it.

With the object of obtaining an increased amount of action, experiments were made by passing a current of warm moist air over zinc turnings. A glass tube, six feet long and one inch in diameter, was packed with zinc turnings and placed within a large brass tube to which steam could be admitted. The amount of action, if any, was indicated on a plate, placed in a dark box at the end of the tube. Even under the most favourable conditions no very large amount of action took place. When a current of moist warm air was passed through the tube for an hour, a fairly dark picture was obtained. If the air was dry, no picture appeared. If amalgamated zinc was used in place of pure zinc, a darker picture was formed, and, as a check on these results, dry and moist air, both warm and at ordinary temperatures, was passed through the tube, no zinc being present, and then no action took place; also, when ozonised air was passed through the tube, there was no action. Passing now from the metals to the organic bodies capable of acting on a photographic



plate, it has been found that they belong essentially, if not solely, to that class of bodies known as terpenes, and it is a general property of all this class of bodies when oxidising to give rise to hydrogen peroxide. Thanks to Dr. Tilden, experiments have been made with most of the terpenes, and all were found to be very active bodies; both pinene and limonene were tried, in their dextro and lævo-rotatory state, but their activity appeared to be the same. Oxidised and other compounds connected with the terpenes, such as terpineol camphor, thymol cymene, have no power of acting on a photographic plate, but ordinary turpentine and terebene are very active bodies.

Most of the ordinary essential oils, such as bergamot, peppermint, pine, lemons, cajuput, &c., have been experimented with, and, without exception, have been found to be active bodies. It is well known that they all contain terpenes; they are also characterised by a strong odour, and, as ordinary scents contain some of these bodies, it follows that almost all vegetable bodies having a strong smell are capable of acting on a photographic plate. Eau-de Cologne gives a good picture, so do many wines and brandy, and coffee, guaiacum, cinnamon are also active substances; thus the photographic plate becomes a very delicate test for the presence of all these bodies, and, as the action is cumulative, it may even compete with the sense of smell.

In addition to the essential oils, the ordinary vegetable oils, such as linseed oil, which is the most active, and colza and olive, which are much less active and have much less power of absorbing oxygen from the air, can act on a photographic plate. The tetra paper readily goes blue if suspended in a bell jar which has a few drops of linseed oil in a dish within it.

The mineral oils are, on the contrary, devoid of this power of acting on the sensitive plate, and the same applies to bodies such as benzine, phenol, naphthalene, aldehyde, methyl alcohol, coal naphtha, &c.

It would seem, then, that all the organic bodies capable of acting on the photographic plate are capable of giving rise to the formation of hydrogen peroxide when they oxidise in moist air.

W. J. RUSSELL, Ph.D., V.P.R.S.

(To be continued.)

#### DEKKO PAPER.

MR. EDMUND A. ROBINS, Lecturer to the Aldenham Institute, gave a series of demonstrations of Dekko paper at the Croydon Camera Club-rooms on Wednesday, March 15, which attracted an audience of about forty members, amongst whom were several of the leading photographers of the town.

In the course of his opening remarks, Mr. Robins stated that the paper, which was only introduced to the notice of photographers about a month ago, is made in four grades, ranging from enamel-like surface to rough texture. The lecturer claimed that the paper would print, at the will of the operator, in colours extending from blue-black to black, brown, warm brown, red, and purple. To illustrate the variety of colour possible, a number of delightful prints of somewhat large dimensions were displayed on the walls, and others handed round. These fully bore out the lecturer's contention as to the large range of colour attainable. Our readers may like to be reminded that Dekko is a paper which is handled much as is bromide paper, with the important exception that, although it may be printed by gaslight, it may be developed without needing a dark-room light, but in any room as ordinarily lit. Of this the lecturer began by giving his audience ocular proof. Taking a sheet of paper from its packet, and standing within seven feet of a brightly burning incandescent electric light, the paper was placed under a negative, and an exposure of twenty seconds given to two gas burners at a distance of about six inches. The print was taken out, with the same bright light shining, and developed in an uncovered dish. The image began to appear in about twenty seconds, development being complete in about one minute. The resulting tone was a warm black. Subsequently Mr. Robins showed how, by prolonging the exposure and modifying the developer, various other tones could be obtained. In this regard he described a developer which had been found particularly successful, the ingredients of which had not as yet been published:—

Metol .....	8 grains.
Hydroquinone .....	80 "
Sodium sulphite .....	2 ounce.
Sodium carbonate (crystals) .....	3 "
Water .....	100 ounces.

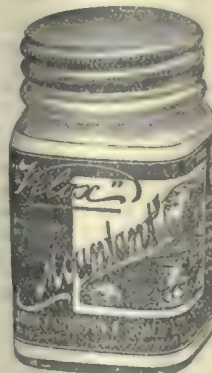
In using the above, add to each ten ounces half a fluid ounce of a ten per cent. solution of hypo. With this the lecturer produced several charmingly toned pictures. The development is much slower than where a black tone is aimed at, and, if it is stopped when a yellow brown is reached, on placing the print in the fixing bath (alum hypo) a beautiful Bartolozzi red results. By leaving the print longer than needed for fixing, the red gradually changes to brown, and then to purple brown; in this way the operator can greatly and easily modify the tones. This action is also, at times, useful in correcting errors of exposure; an over-exposed and under-developed print may be hardened and strengthened by the action of the fixing bath, which slightly reduces the high lights and fortifies the shadows.

## Our Editorial Table.

GRIFFIN'S PORTABLE PREPARATIONS FOR PHOTOGRAPHY.

John J. Griffin & Sons, 20-26, Sardinia-street, W.C.

MESSRS. GRIFFIN have now added to their list of above Velox mountant in bottles and tubes. Their excuse for increasing the already large number of mountants on the market is that users of Velox, bromide, gas-light development, and other stout papers frequently find trouble in getting their pictures to grip the mounts, the tendency to peel at the corners being more noticeable in the rough papers which incline to absorb



the solution. The Velox mountant is made with specially strong adhesive powers. It is always ready for use, is free from acid or other contaminating substances, and keeps well. The composition, having no excess of water, should be spread rapidly and sparingly, and, if this is done with care, squeezed glazed prints may be mounted without loss to surface.

The collapsible tube, containing two ounces of mountants, Messrs. Griffin believe will be welcomed by many photographers who require small quantities of mounting material in a convenient form.

#### THE FRENA PNEUMATIC FLAP SHUTTER.

R. & J. Beck, Limited, 63, Cornhill, E.C.

MESSRS. BECK have for some time felt the desirability of introducing a flap shutter for use with their Frena camera when slow exposures are required—exposures, which are yet too quick to be made satisfactorily with the ordinary time-exposure arrangement. The Frena pneumatic flap shutter is made to fit on to the front of the camera in such a manner as not to interfere with the use of the magnifiers. Great care has been taken in designing it to prevent there being any jar to the camera when the flap is raised, and to ensure its shutting firmly at the end of the ex-



posure. The flap is lined with velvet to render it light-tight. The shutter of the Frena camera gives exposures from one-eightieth of a second to one-fifth of a second, and, for time exposures, it is necessary first to set the speed plate to one-fifth of a second, after which the set-off bolt must be pulled out to open the lens; it can then be left for as long an exposure as required, and the lens again closed by pushing in the bolt. This is all that can be desired for long exposures, but it is not satisfactory for intermediate ones, say, from one-fifth of a second to ten seconds, as it is difficult to perform the double movement without shaking the camera.



It is, therefore, for this class of work that the Frena pneumatic flap shutter has been designed. The method employed for fitting the shutter is such that it is not necessary for it to be permanently attached to the camera. A base plate is supplied with each one, which can be fixed to the different-sized cameras, as directed below. On this are three small projecting catches, by means of which the shutter can, with ease, be put on or taken off as required. The instructions for use are: Set the shutter speed plate to one-fifth of a second, and fix on the flap shutter. Pull out the set-off bolt. The camera is now ready for use. To make an exposure squeeze the pneumatic ball, when the flap will open and remain open as long as the ball is pressed. On finishing the exposure the set-off bolt should be pressed in.

#### THE CLIMAX ALBUMENISED PAPERS.

J. J. Griffin & Sons, 20-26 Sardinia-street, Lincoln's Inn-fields, W.C.

MESSRS. GRIFFIN write us: "There have been several remarks relating to albumen paper in your recent issues, and this has prompted us to send you particulars of our 'Climax' papers, the existence of which you may not be aware of. These papers present distinct advantages to high-class professional photographers, for whom they are specially made. We do not consider that they come under the class of ordinary ready-sensitised papers, for the reason that the acid is applied in a separate floating, and consequently, if the paper is thoroughly washed before toning, no contamination of the toning bath takes place. You therefore get the advantage of acid in the paper without its drawbacks. The superiority of a paper floated in this way over home-made sensitised paper is that it gives you a wider range of contrast in the shadows and prints about twice as quickly. The paper we are at present preparing is quite as quick as any gelatino-chloride paper on the market. We make the paper in two or three grades."

The pamphlet Messrs. Griffin send us gives particulars and formulae for the manipulation of their Climax papers, and is to be had on request. Albumen papers with characteristics such as those claimed for the Climax papers should be popular.

#### CATALOGUES RECEIVED.

Parkin & Fry, 31 and 33a, Sandstone-road, Liverpool.

MESSRS. PARKIN & FRY's catalogue apprises us that they undertake bromide enlargements on paper and opal, carbon enlargements on paper and opal, carbon prints on ivory, the production of negatives, lantern slides, platinotype enlarging, and many other departments of photographic work. Carbon tissue, bromide opals, dry plates, bromide paper, and printing-out paper are also made by the firm, whose works are at Etna Mills, Old Swan, Liverpool.

Jonathan Fallowfield, 146, Charing Cross-road, W.C.

MR. FALLOWFIELD is holding a special clearance sale of surplus stock to make room for new goods for the present season, which, in Mr. Fallowfield's opinion, promises to be an exceptionally good one in the photographic trade. The articles for clearance are detailed in four lists. They comprise general photographic goods, apparatus, dry plates and films, and mounts. Innumerable bargains are offered, and we advise our readers to give the sale particular and immediate attention.

FROM MESSRS. A. & M. ZIMMERMANN, of 9 and 10, St. Mary-at-Hill, E.C., we have received a little book which treats of the photographic preparations of the Actien-Gesellschaft für Anilin-Fabrikation of Berlin. Full directions for the use of rodinal, alkonogen, diogen, amidol, glycin, metol, para-amidophenol, diphenal, and ortol are given. The booklet, which is a distinctly useful one, is supplied free to dealers for distribution.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, March 22, at eight o'clock. Travellers' Night. "Lowestoft and Neighbourhood," by Mr. H. Vivian Hyde.

THE ITALIAN EXHIBITION.—The name of Mr. Ralph W. Robinson was inadvertently omitted from the list of contributors to the Invitation Section of this Exhibition.

MESSRS. ARCHER & SONS, of Lord-street, Liverpool, having bought the business of Messrs. Wood Brothers, are holding an annual sale to clear out the latter's stock.

THE Thornton-Pickard Manufacturing Company, of Altrincham, inform us that, notwithstanding increased competition, the sales of their shutters and cameras are larger than hitherto.

ON Wednesday, March 15, the members of the South London Photographic Society held a Cinderella dance at the Surrey Masonic Hall, Camberwell, S.E. Some two hundred ladies and gentlemen attended, and a programme of fifteen dances was gone through. There was a quadrille—"La Société Photographique du Sud de Londres."

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, Tuesday, March 28, at 12, Hanover square, at eight p.m. "Ozotype with Carbon Tissue, a new method of Pigment Printing," by T. Manly.

THE AUSTIN-EDWARDS MONTHLY FILM NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Mr. J. C. Oliver, 2, Royal-terrace, Glasgow, for his negative, *Buchanan-street, Glasgow, at Night*.

MESSRS. TAYLOR, TAYLOR, & HOBSON inform us that, on and after March 9, all their London business will be transacted at No. 18, Berners-street, W., these premises being more convenient than the present offices in the Charing Cross-road. Their telegraphic address will remain as before, "Illiquo, London."

THE names of the prize-winners in the Warwick Monthly Competition for March are:—1st prize, 10s., *Portrait Studies of Child*, Mr. H. J. Dalby, 82, Wellington-street, Woolwich; 2nd prize, 5s., *Hard Times*, Mr. A. E. Casson, Burlington-road, Withington, near Manchester; 20 prizes 1s. each: Dr. J. W. Ellis, Messrs. J. C. Oliver, Arthur Waterall, J. D. Murray, L. Bagshaw, Nichol Elliot, Ralph W. Robinson, Frank M. Sutcliffe, William McLean, Jas. C. Kingdon, H. R. Campion, A. W. Cooper, T. H. Baker, John H. Coath, F. B. Kempe, Ernest Wood, H. C. Leat, Edward Brightman, Misses Amy Nott, H. Phillips.

MESSRS. A. & M. ZIMMERMANN, of 9 & 10, St. Mary-at-hill, write: "In your issue of the 10th inst. we notice an article on 'Magnesium Cartridges,' which you say is due to the inventor, Mr. York Schwartz, Hanover. As we are agents for Mr. York Schwartz in this country, we immediately asked him why he had given publicity to the process of making magnesium flashlight powder and cartridges. He informs us to-day that he never communicated the article to you, and that no doubt it was taken from the English patent No. 27,115. Under these circumstances, we shall thank you to make it known that Mr. York Schwartz's specialities are patented, and that the article was not communicated by him, and that it is merely a copy of the patent."

THE BIRTAC AT THE ROYAL INSTITUTION.—By request, Mr. Birt Acres gave a demonstration of the "Birtac at Home Animated Photography" at the Royal Institution, Albemarle-street, W., on Friday evening last. Mr. Acres used his new gas-pressure apparatus, by means of which, using the gas from the ordinary house supply, a greatly increased pressure of gas was obtained with a correspondingly great increase of the light obtained from an incandescent mantle. This new gas apparatus works in conjunction with the projecting apparatus for showing the animated photographs, and is, to all intents and purposes, automatic, as the turning of the handle to show the photographs actuates the compressing apparatus; and, further, it is automatically governed, so that a child could work it with absolute safety.

THE Annual Dinner of the North Middlesex Photographic Society was held on Saturday evening, March 18, at the Holborn Restaurant. The President (Mr. J. C. S. Mummery) occupied the chair, and he was supported by about sixty members and friends. The toasts included "The Society," "The Photographic Press," and "The Visitors." During the course of the evening the certificates awarded at the recent Members' Exhibition were presented to the successful competitors by Mr. F. Colin Tilney, who was one of the Judges. From the remarks of the President in reply to the toast of the Society, it appeared that the North Middlesex Photographic Society is in a thoroughly sound and healthy state. Songs, music, and recitation greatly added to the enjoyment of the evening, which passed off with the greatest success.

G.E.R. MECHANICS' INSTITUTION (PHOTOGRAPHIC SECTION).—This Society held their Sixth Annual Exhibition on the 14th and 15th inst., and it does great credit to Mr. H. W. Bennett (who has been delivering a course of lectures to the society during the past six months) to be able to record a very marked advance in the quality of the members' work over that of the previous exhibitions. The loan pictures included those of the Affiliation, and others by Messrs. The Sandell Plates and Films, Limited, H. T. Malby, H. Wilmer, S. D. Holden, and F. Moore & Company. There was a cinematograph display each evening. Mr. S. D. Holden lent and worked a photo-chroscope, as did the Rev. H. W. Gresswell a Röntgen-ray apparatus. The South London Society lent their lantern lecture and slides illustrating a holiday in Rotterdam, and some members' slides were also put through the lantern. Messrs. Reginald W. Craigie and F. Seyton Scott kindly acted as Judges, and awarded the medals as follows:—Open Class, for General Work: Silver medal, *A Summer Evening*, by Mr. H. W. Bennett; bronze medal, *An Essex Backwater*, by Mr. S. C. Stean. Members' Classes (1) Landscape: Silver medal, *Where the Birch and the Brake do Grow*, by Mr. H. D. Banks; bronze medal, *Silver Birches*, by F. Hammond. (2) Architecture: Silver medal, *Bishop Fox's Chantry, Winchester Cathedral*, by J. H. Ayling. (3) Marine: Silver medal, *Bound for the Fishing Ground*, by J. K. Ayling; bronze medal, *The Incoming Tide*, by H. D. Banks. (4) Portraiture: Bronze medal, *A Faithful Servant*, by H. W. C. Drury. (5) Instantaneous: Silver medal, *On the Fasel*, by C. W. Harris; bronze medal, *A Scrum Breaking-up*, by H. D. Banks. (6) Lantern slides, in sets of six: Silver medal, *Landscape*, by J. K. Ayling; bronze medal, *Forestry*, by C. Harding. Consolation prize to W. S. Rogers for a frame of quarter-plate pictures. This prize is given to the best picture exhibited by a member who has never taken a prize.

BRENTFORD PHOTOGRAPHIC SOCIETY'S EXHIBITION.—The first Exhibition held under the auspices of the Brentford Photographic Society was opened on Wednesday, March 15, at St. Paul's School Annexe, by the President (the Rev. T. Eland, M.A.). The Society has hardly been in existence six months, and some amount of misgiving was felt at the idea of holding an Exhibition at so early a period in their history. Happily, all gloomy prognostications of failure were doomed to non-fulfilment, and the success of the Exhibition, which was continued on Thursday evening, was beyond the expectations of the most optimistic. The room was kindly lent by the Managers of St. Paul's Schools, and at the opening there was a large attendance of visitors to inspect the exhibits, exactly 100 in number, which were well ranged on the walls. For a beginning the number is very encouraging, while the quality of the exhibits was of a high order, there being among them some very beautiful pictures. The result, on a whole, is certainly very creditable to the organizing



ability of the Hon. Secretary (Mr. Hilton Grundy) and the members of the Committee, while the President himself has taken a great personal interest in the affair, sending some pictures not for competition. The Exhibition was divided into three sections—Members' Class, Members (not for competition), and Open Class. In the Members' Class three prizes were offered by the Society, the first being a silver medal, and the second and third the choice between an ekronometer and a Watkins' exposure meter. The first prize was secured by Mr. A. R. Read, junr., who had on show a splendid collection of platinum and silver prints, for his picture *After Love*, one of a series displaying beautiful sky and cloud effects. Mr. A. R. Read, senr., came second with a variety of prints. Of these two flower studies were selected for special commendation, one representing *Autumn Queens* (silver), and the other *Cherry Blossom* (platinum). All gave evidence of careful treatment in every department. The third prize was awarded to Mr. E. N. Pearce for a praiseworthy collection of varied subjects in different printing. Among them were some very good architectural pictures. Account was also taken, in giving this award, of three of Mr. Pearce's exhibits in the Open Class, *Waiting for the Tide* (platinum), *The Home of the Frog* (Alfieri matt), and *Triforium Arcade, Gloucester Cathedral* (bromide), the first two being specially interesting studies. Mr. Fred Turner, F.R.Hist.Soc., was commended for technically careful work in three silver prints, all of which were of architectural subjects, this being the department of photography in which he takes a special interest. In the same class were exhibits by the Rev. P. C. West, Mr. F. H. Read, and Mr. H. G. Pearce. The President was represented in the "not for competition" class by some very striking pictures, his subjects being gathered from Continental cathedrals. The figures of King Arthur and Theodric, from the tomb of Maximilian at Innsbruck, were particularly good specimens. Mr. F. Hollyer had on view but one picture, a splendid reproduction of J. S. Eland's Academy portrait of Miss Doris Seth-Smith, a beautiful piece of work. The Hon. Secretary (Mr. Hilton Grundy) was also represented in this section with some good work on various subjects, among which should be mentioned his view of Windsor Castle, also *On the Heath*, and *On the Dart*. The Open Class included some splendid contributions from other clubs. The first prize was won by Mr. E. H. Lamb, of the South London Photographic Society, with a splendid platinum picture, *Autumn in the Woods*. Mr. E. G. Boon secured the second silver medal with a picture sent all the way from Italy for competition, called *On the Lagoon* (platinum), and the third prize, a bronze medal, was awarded Mr. W. E. Walker, of the Chiswick Camera Club, for his *Sunset on the Pool*, a Velox print. The same exhibitor was also showing a very good winter scene in bromide. Mr. H. Gentry, of the Chiswick Club, was represented by two very good pictures in bromide, *Autumn* and *Nature's Carpet*. Mr. G. J. T. Walford's *Close of a Stormy Day* was also a splendid picture, and Mr. G. Fryer's collection included some striking carbon pictures.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
27.	Beverley .....	Rambles in Yorkshire. T. J. Morley.
27.	Bradford Photo. Society .....	Annual Dinner.
27.	Camera Club .....	Experiments in Stereoscopic Projection with the Single Lantern. J. H. Knight.—Demonstration of Working Gravura Paper.
27.	Kingston-on-Thames .....	Exhibition of Members' Lantern Slides.
27.	Oxford Camera Club .....	Prize Slides.
27.	Richmond .....	Practical Notes on Outdoor Work with the Camera. Rev. A. H. Blake, M.A.
28.	Birmingham Photo. Society ..	Demonstration: Gum bichromate Process. W. J. Warren.
28.	Hackney .....	With Cycle and Camera. Dr. Roland Smith.
28.	Leeds Photo. Society .....	Some New Points in Platinotype Printing. Rev. J. Beauland, M.A.
28.	Newcastle-on-Tyne .....	Special Stereoscopic Meeting. J. Hedley Robinson.
28.	Royal Photographic Society ..	Ozotype with Carbon Tissue: a New Method of Pigment Printing. T. Manley.
28.	Shropshire .....	Exhibition of Professor Ives's Kromeskop.
29.	Oroydon Camera Club .....	Practical Points on Developing and Printing. A. Horsley Hinton.
29.	Leeds Camera Club .....	Lantern Night. The Members.
29.	Photographic Club .....	Leicester and Neighbourhood. H. Vivian Hyde.
30.	Bolton Mutual Photo. Society ..	Open Night.
30.	Leigh .....	Prize Prints.
30.	Oldham .....	Valley of Conyway. A. Marcroft.
31.	Oroydon Camera Club .....	Whole-day Excursion.
31-April 4	South London .....	Easter Excursion.
31.	West London .....	A Tour Among the Southern Alps. G. Lamley and H. Selby.

### ROYAL PHOTOGRAPHIC SOCIETY.

MARCH 21.—Photo-mechanical Meeting,—the Rev. F. C. Lambert, M.A., in the chair.

#### CURIOUS PHENOMENON IN PHOTO-ETCHING.

Colonel WATERHOUSE (Hon. Secretary) exhibited some prints which had been sent to him by Mr. Turner, who was formerly his assistant in the Photographic Office of the Survey of India Department, at Calcutta, and who is still there, and which showed a curious effect of reversed etching in the heliogravure process. The plate had been developed during very dry weather, and dried

with spirits, and when put into a solution of perchloride of iron (44° Beaumé) there was no sign of action in the shadows for fully five minutes, and the perchloride then suddenly attacked the high lights instead of the shadows. This action continued until about two-thirds of the image was etched in reverse, when an action commenced in the deepest shadows, the result being very nearly a reversal of the image in the print. Another plate of the same subject, etched with the same solutions two days later, when there was more moisture in the atmosphere, behaved quite normally. It was suggested that the gelatine film of the first plate was so dry that the thin film in the shadows formed a sufficient resist to the strong solution of perchloride, whereas the thick film of gelatine, due to its natural attraction for moisture, absorbed what water there was in the solution and carried with it a certain quantity of the perchloride. Colonel Waterhouse also showed some very good experimental three-colour prints by Mr. Turner.

#### AUTOMATIC ADJUSTMENT OF THE HALF-TONE SCREEN.

Mr. W. GAMBLE read a paper with the above title, the object of which was to show that, in half-tone negative-making, as the distance of the screen should bear a constant proportion to the focal extension of the camera, it was quite possible to automatically secure the necessary distancing without any calculation or guesswork. He thought it must be obvious, to every one who had given any consideration to the principle of the process, that there must be a fundamental law underlying it, and there appeared to be no reason why formula should not be provided by means of which the thoughtful man might work with accuracy and directness in every given case, no matter what lens, camera, screen, or copy, had to be dealt with. Further, if the process could be governed by a constant law, means might be devised for achieving automatically by some mechanism the same end that had hitherto only been attained by the exercise of human thought, skill, and ingenuity. The fundamental formula for the half-tone process which the author of the paper put forward was that worked by Mr. Branfill in preparing a series of tables of screen distances, namely, the screen distance ( $x$ ) is to the camera extension ( $f$ ) as the screen opening ( $s$ ) is to the lens aperture ( $a$ ); or  $x = f \times \frac{s}{a}$ . Then, if  $f = 20$  inches,  $s = \frac{1}{100}$  inch for a 100 line screen,  $a = \frac{1}{2}$  in. stop, the screen distance would be  $\frac{1}{2}$  in.; as the camera was extended to 20 in., there would be a distance of  $\frac{1}{100}$  in. for each inch the focus was extended. Assuming this formula to be reliable, it would be possible to obtain the screen distance by automatic means, and it became merely a mechanical problem to decide how to make the screen move  $\frac{1}{100}$  in. when the lens moved 1 in. Different methods of securing the necessary movement were considered, and it was proposed that one definite size of stop should be selected for each screen ruling, in which case the adjustment of the screen could be made mechanically by connecting the screen-adjustment gear to the focussing screw, and introducing a differential motion, so that, when the focus was extended one inch, the screen gear would advance, say,  $\frac{1}{100}$  in., or in any other ratio which might be determined upon. Mr. Gamble said he did not expect the average worker of to-day would take kindly to his idea, for the world's workers had always fought against anything which performed automatically that which had before needed human control; and he concluded by quoting the following sentences from a recent article by Mr. Hall Caine on his tour in America: "One thing which strikes the most ignorant traveller in America is the intelligent attitude of the American workman towards automatic machinery. So far from being afraid of it, he welcomes it. The English workman, on the other hand, appears to discourage and suppress it. It would seem to me that the American workman is fighting *with*, whilst the English workman is fighting *against*, a very clear law of nature, and that sooner or later the trade of the world will be to him who uses every help that nature gives him."

Mr. LASCELLES said he had for the past nine months been working in a similar direction to Mr. Gamble; he was certain the idea could be brought to a successful issue, and it would be of infinite value to half-tone workers. If a camera with this attachment cost an extra 20%, he would expect it to save 50% worth of labour in the first year that it was used.

A brief general conversation ensued.

#### COMING EVENTS.

March 28, Technical Meeting. "Ozotype with Carbon Tissue: a New Method of Pigment Printing," by Mr. T. Manley. April 11, Ordinary Meeting. "The Correct Exposures to be given to Photographs of the Corona," by Mr. E. W. Maunders.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 16.—Mr. J. S. Teape in the chair.

A short discussion took place on the question of the correct procedure in copying an old painting in which the delicate details had all gone to about the same shade of yellow. The particular example referred to was one of Turner's pictures in the National Gallery. A yellow-sensitive plate, used with a yellow screen, was recommended, the depth of the latter depending upon the actual condition of the original, and only determinable by experiment.

Mr. T. E. Freshwater exhibited, by means of the optical lantern, some forty slides illustrating Chinese types and scenery. They were the work of an official in connexion with one of the English missions, and as such were deserving of commendation, presenting as they did some characteristic portraits of private life in China, the soldiery, &c.

Mr. LEWIS MEDLAND showed a further instalment of his photographs in the northern capitals of Europe, namely, St. Petersburg and Moscow. The account of his successful endeavours in evading the arm of the law in the neighbourhood of the Kronstadt forts, of which he had several pictures, was listened to with interest, and the whole series, of a country by no means overdone photographically, being a little out of the track of ordinary tourists, was very well received. Mr. Medland said the pictures were some twelve years old, and, referring to the slides themselves, said they were all made by the collodio-bromide process.



## PHOTOGRAPHIC CLUB.

MARCH 15.—Mr. E. W. Foxlee in the chair.

Mr. W. R. STRETTON showed one of the negatives reduced with persulphate of ammonium to which he had referred on another occasion, and in which he had been troubled with considerable stain, the gelatine itself being affected. Others he had showed the effect of the persulphate upon intensified negatives in the production of what he styled a fine selection of coloured muds. He could not accept the plea that imperfect fixing of the negative was at the bottom of it, and, although such a state of things might encourage the stain, it was evident that other factors entered into the question.

Mr. G. W. TOTTEM, however, remarked that simply long fixing meant nothing necessarily. He had met with cases where plates which had been left in a stagnant bath for a very long time were removed and found to be quite imperfectly fixed.

Mr. T. SKELTON (of Messrs Elliott & Son, of Barnet) gave a demonstration, intended for beginners, in the carbon process. He showed a piece of plain carbon tissue, and went through the operations of sensitising in bichromate. From the sensitising bath the tissue is placed on a zinc plate, and the surplus solution removed by passing a squeegee over the back of the tissue, leaving it with a nice, even surface. This, when dried, is exposed under a suitable negative in quite the usual manner, with the ordinary pressure frame. There is a slight difference, in that it is necessary to have round the edges of the negative what is known as a safe-edge, a narrow band of opaque material or varnish, so that the picture may be surrounded by a band of tissue unacted upon by light. For a half-plate negative a band of one-eighth of an inch is usually sufficient. The printing is not judged in the usual way, for the reason that light action does not manifest itself by a colourific change in the tissue, and recourse must be made for guidance in this respect to a small instrument known as an actinometer. Mr. Skelton passed round Johnson's form, but there are several which may be employed. The principle of the thing is that, having found the relative sensitiveness of the tissue and the strip of P.O.P. or other paper used in the actinometer, it becomes possible to decide that a certain negative requires so many times the period taken by the silver paper, and so we give the number of tints required. There are two forms of carbon printing—single and double transfer. For the double transfer a plate of ground opal is prepared with French chalk. It then receives a coating of dilute enamel collodion (one in three), and after this is set, but before it is dry, the plate is immersed into plain water, where it remains until the surface ceases to repel the water, in other words, until the remaining solvent has disappeared. The plate is then in a condition to receive the piece of printed tissue. This latter is first soaked in water, not for so long that it will take up all the moisture it is capable of doing, but, generally, until it flattens out in the tank of water. Ordinarily the tissue is squeegeed on to the plate, but, if properly set about, it is no more difficult to apply the tissue without the aid of the squeegee, and be sure that it is free of air balls, than it is to do it with the squeegee. Mr. Skelton preferred to do it without the squeegee's help, and said, moreover, that this removed a possible source of injury to the wet tissue. The only drawback about it was that a longer time was required before the print was ready to be developed, holding as it does a larger quantity of water, which the squeegeed print does not. While these prints, then, were draining, the lecturer took up the single-transfer process, touching in his remarks upon attempts to reduce the double transfers to a single without reversal of the picture, whether by the use of a mirror, by reversing the negative, or by printing through the glass. Taking some pieces of prepared etching paper as the final support, and pointing out the importance, in the case of rough papers, that the air should be thoroughly expelled in bringing the tissue and paper into contact, he proceeded to soak and squeegee the transfer paper and printed tissue in much the same manner as previously described. Development is effected by the use of hot water of an average temperature of 105° Fahr., and is really a washing-out process, the gelatine and pigment unacted upon by light remaining soluble and yielding to the warm water. The demonstrator showed the operations, having the printed tissue with the water, as a result the pigmented gelatine soon commencing to run. Before long the image will be plainly visible, and, as soon as it is judged that development is complete, the combined solution, or "bleeding" of the gelatine, may be stopped by immersion in alum. Time did not allow of the double-transfer prints developed at the meeting being transferred to their final supports, owing to the necessity that they should be dried between the operations of development and final transfer, but prints developed and transferred on another occasion were stripped, the methods involved being described. Mr. Skelton kindly answered a number of questions of detail, and a hearty vote of thanks was passed to him and Messrs. Elliott & Son for the demonstration.

## FORTHCOMING EXHIBITIONS.

1899.

March 24–May 13 ... National Trades and Industrial Exhibition, Bingley Hall, Birmingham. Manager, Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.  
 April 3, 4 ..... Beverley. T. J. Morley, Toll Gavel, Beverley.  
 „ 12, 13 ..... Plymouth Photographic Society. Hon. Secretary, W. H. Harris, 91, Cobourg-street, Plymouth.

## Patent News.

The following applications for Patents were made between March 6 and March 11, 1899:—

DAYLIGHT CHANGING.—No. 4851. "Improvements in Method, Means, and Apparatus for Loading and Unloading Cameras and Plate-holders with Sensitive Photographic Plates and Films without having recourse to a Dark Room." A. B. JOHNSTON and J. E. HENDERSON.

COLLAPSIBLE DARK ROOMS.—No. 4978. "Improvements in or relating to Collapsible Dark Rooms for Photographic purposes." A. E. ANDERSON and the "X" CHAIR PATENTS COMPANY, LIMITED.

CAMERAS.—No. 5235. "Improvements in and relating to Photographic Cameras." C. S. LUMLEY, T. K. BARNARD, and F. GOWENLOCK.

PRINT-EXPOSURE INDICATOR.—No. 5281. "Improved Device for Indicating Exposure of Photographic Prints." J. C. S. MACKINTOSH.

VIGNETTING.—No. 5386. "A Device for producing Vignettes in Copying Pictures and the like by Photography." W. J. HOLT.

TWIN LENS CAMERA.—No. 5396. "New Twin Photographic Apparatus." Complete specification. M. CONSTAN.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

## THE GLOUCESTER CONVENTION.

To the EDITORS.

GENTLEMEN,—Several circulars having reference to the forthcoming meeting at Gloucester having been returned, marked "gone away," I shall be glad if you will allow me to inform any members who may have removed since last meeting, that I shall feel obliged if they will favour me with their present address.

I need scarcely say I shall be pleased to send a "programme of arrangements" to any of your readers who may desire it. Thanking you  
 F. A. BRIDGE

East Lodge, Dalston lane, London, N.E. (Hon. Sec. and Treas.)

March 20, 1899.

## ROLLABLE FILMS.

To the EDITORS.

GENTLEMEN,—If "H" and "W. Barry" will refer to your issue of February 10 (p. 84), also of March 3 (p. 134), they will find that their wants are likely to be supplied in the near future. A reference also to your reply to myself in March 3 will also, I presume, bring the matter up to date, as, so far, I do not see the new rolling film advertised.

I quite agree with W. Barry that the stripping films issued by the Eastman Company gave splendid results, and I am looking forward to being able to procure the Secco films, because I hope to find them of equal quality, and they will be so useful for carbon work, single transfer being all that will be required, as they can be printed from either side.—  
 I am, yours, &c.,  
 E. H. MICKLEWOOD.

5, St. Michael's-terrace, Plymouth.

To the EDITORS.

GENTLEMEN,—In reference to the above subject, I beg to corroborate Mr. Barry's statements in your last issue. It has for a long time been a matter of great regret to me and to many of my friends that the Eastman Company no longer make the paper film, which they used to before celluloid came into fashion. Some of the best negatives I have ever taken were on these paper films, both stripping and non-stripping, in a roll-holder, and the film was in every way more easy to manipulate than the celluloid film now manufactured by them. About two years ago I wrote to Messrs. Eastman, asking them if they could not see their way to putting such a negative paper on the market again, but they replied that they could not, for they did not consider that there would be sufficient demand for it. I think they were wrong in this supposition. Two or three days since, when putting my dark room in order, I came across a portion of a roll of paper film, which I laid by in the year 1899 (about the time it ceased to be made). To test its present condition, I exposed a portion of it in my garden and immediately developed it. I was much astonished to get so good a result on paper which had been carelessly knocking about my dark room for ten years, subject to very varying atmospheric conditions. I enclose you the negative for your inspection, and I think you will agree with me that it is a very fair negative to get under the adverse circumstances.

Could you not, Sir, use your powerful influence to induce the Eastman Company, or some other manufacturers, to place within our reach once more so excellent a negative paper? It would be a "sweet boon" that many would be grateful for.

There are, I know, one or two firms who make a negative paper, but, having tried these papers, I confess they are not satisfactory. They show the grain of the paper, and are not quick enough for instantaneous work.—I am, yours, &c.,  
 A. M. MACDONALD.

Halton, Hastings.

[We believe that Messrs Wellington & Ward, of Elstree, intend shortly placing on the market a rollable film answering to the requirements laid down by our correspondents.—EDS.]



## THE FOCAL LENGTH OF A LENS.

To the Editors.

GENTLEMEN,—If I ask you to give me room for a reply to Mr. Dallmeyer's letter in your issue of the 10th, it is not from any desire to discuss the merits of his solution of the problem which we both of us desire to advance, but because I think that he has hardly appreciated the conditions under which it is sometimes desirable to obtain the focus of a lens.

It is easy to see that there are cases where the solution which is proposed cannot be carried out: in many hand cameras it would be impracticable, and even in many others it would be very difficult; nor is the measurement quite so easy as he supposes, and it is still less easy to formulate all the procedure in terms so simple as to ensure that the ordinary photographer may be able to make use of it.

In his original communication to you, Mr. Dallmeyer truly said that what the photographer wants is the knowledge of the focal length of his lens and the place of the *front focal point*, which involves the position of the front nodal plane, from which the enlarger should measure. Why, then, is it that opticians do not give these data? We get sections of the lenses, sometimes we get the curves for certain assumed indices of refraction and dispersion; these are interesting to opticians, and might aid those who make colourable imitations of the lenses, but to the working man they are no use. The optician *knows* what would be useful to him, and gives him something else which is of no value!

But, in fact, the knowledge of the focal length of a lens (approximately) is wanted by a photographer for other reasons. A good many lenses are in use which have no proper system of diaphragms, and when they are supposed to be numbered by rule some blunder has been made. I can speak from my own experience. Some time ago I had in use a borrowed camera; it was furnished with a good rectilinear lens and an iris diaphragm. I soon found that the numbering of the diaphragm was incorrect; and, moreover, that the openings were not even in the proportion which they purported to bear to each other. The lens, too, was so attached to the camera that I could not readily disconnect it. Not being of the persons who expose a second with the smallest possible stop, I proceeded to determine the focal length of the lens, and measure the diameter of the various openings of the diaphragm; but I could only have done this by the second method I gave, a method which is universally applicable, if not as accurate as that which has been under discussion.

Let me say in conclusion that I have tried this method, got over the difficulties which offered themselves, and can vouch for it that in careful hands it is very accurate; but the use of it has confirmed me in the opinion that there are a variety of conditions required for its successful application which cannot always be attained.—I am, yours, &c.,

J. F. T.

## COLOUR FALLACIES.

To the Editors.

GENTLEMEN,—In an article in THE BRITISH JOURNAL OF PHOTOGRAPHY of February 24 last, on the above subject, you utterly condemn Mr. R. Hitchcock's theories. Some eight or ten years ago I amused myself with attempts to get photographs in colours, and, from my experiments, came very nearly to the same conclusions as Mr. R. Hitchcock, viz.:—

1st. That colours of an object do impress themselves on an orthochromatic photographic plate, and that the specific effect is retained in the negative.

2nd. That a print from such a negative is also specifically impressed by the colours of the original object.

(b.) The positive print may manifest selective action in the developing and toning solutions, and that thereby the colours of the original object may be more or less correctly reproduced.

My reasons for so thinking and agreeing with Mr. Hitchcock to the above extent are:—

1st. That, in printing on special paper, with special developer and toning solution, I have, to a certain extent, been able to differentiate colours in the prints from an orthochromatic plate which I could not get with an ordinary plate.

2nd. That I could always, more or less, get the same approach to colours each time from the same plate, but not from another orthochromatic plate, exposed at the same time, at the same view, the one being in appearance the counterpart of the other, the exposure and development being the same in each case apparently.

Hoping you will find room in your paper for the above protest,—I am, yours, &c.,

WM. R. O'HARA.

West Lodge, Galway, March 18, 1899.

[The theory we condemned implied that negatives on ordinary plates recorded and transmitted colour; and we still condemn it as absurd. We are much interested in Colonel O'Hara's experiments with orthochromatic plates, and special developing and toning solutions, and should be glad to have further particulars. But, frankly, we are sceptical of such a method having the least value in the reproduction of colour. It fulfils none of the requirements of current theory.—EDS]

## NORMANDY.

To the Editors.

GENTLEMEN,—In response to your invitation to give information about Normandy in the sense expressed by your correspondent in your number of the 3rd inst. (p. 143), the best suggestion I can make—a suggestion which is supported by many years' residence in the country—is that he should follow Major C. Gardner Vatcher's itinerary, as laid down in the article from him you have published in this year's ALMANAC (p. 793). Nothing could be so practical and complete. If more details are wanted by your correspondent about the towns and localities mentioned by Major Gardner Vatcher, Baedeker's *Guide to the North of France* will furnish them with great accuracy.—I am, yours, &c.,

GEORGE FERNAU.

Bellvue, Montvireon par Sartilly, Manche, France, March 19, 1899.

## SPECIMENS.

To the Editors.

GENTLEMEN,—May I trouble you to give me space in your next issue to thank Mr. Gain for his very able letter on this subject, so exactly does it describe my own views, and also to reply to the letter signed "Professional?"

One might easily imagine "Professional" to be "H 21," 24, Wellington-street, so bravely does he take up the cudgels on behalf of the practice of exhibiting "attractive specimens" of other people's work as his own.

I can very easily pass over the sarcastic remarks about amateur editors, &c., as also the best part of the next paragraph, as not having the slightest bearing on the case. But "Professional" wants to know how to obtain a "few specimens of a certain style to complete a fair representation," but he forgets to say of what. Does he want to exhibit a fair representation of *his own* or another person's work? If the former, Mr. Gain gives him a very simple answer; and, if the latter, doubtless some brother "professional" would oblige him with a selection of "attractive cabinet specimens for show-case," but, of course, they wouldn't be "unmounted." "Professional" may try and smother his conscience by saying the "output equals the specimens" he bought, but that doesn't in the slightest degree lessen the deceit; for any man who buys specimens "unmounted" and finishes them on his own mounts, and exhibits them to the public as his own work, is a living fraud, and should be known as such. If "Professional" is "H 21," and this system is right and honourable, as he tries to make out, may I suggest to him that it would be well to disclose his identity? It doesn't seem quite right for "Professional" to defend a certain system, and not have the courage to sign his name.—I am, yours, &c.,

HARRY FRENCH.

1, Railway terrace, Wallington, March 18, 1899.

## To the Editors.

GENTLEMEN,—With reference to the many correspondents who suffer because their specimens and photographs of themselves are either seized by the unscrupulous advertisers or kept back because they are too lazy to return them, I think they (the applicants for situations) have just cause for speaking out. Specimens have to be got from somewhere by these assistants, and it is a most unjust act for any photographer to retain them.

I don't suppose one-half or perhaps a quarter of them are retained because of their value to the photographer, but that is far from an excuse for not returning the same. Again, I do not think it argues very well for photographers as a body to demand seeing specimens of an assistant. Logically or practically, an assistant is not going to send any of his *inferior* work, and he is not going to be quite so immaculate as to refuse a print or negative specimen solely because he did not make it himself. Many specimens are, undoubtedly, sent on to a photographer that could not be reproduced by the assistant. Do photographers *know* this, or do they care? "Cosmos," in his Jottings this week, has a very open remark *re* assistants (see Jotting No. 8), in which he sums up by saying, "A professional photographer is very much like other business men; he knows good work and good men when he sees them," &c. There is no doubt he does *sometimes*. There are good photographers and medium photographers, and photographers who are not good and not medium, and all photographers are not "business men," and many assistants who are not good workmen are "business men," and so I am led to think "Cosmos" has scarcely touched the fringe of the subject, and there are hundreds of assistants who are certainly suffering an injustice, and will continue to do so until something can be done.

In a letter by W. A. Kidd, in your Correspondence this week, he says, "I concur with 'A. A.' in his letter. It is not a first-class assistant that is required nowadays, but perhaps it would be better to term them dabblers. A first-class assistant gets what I call insulted," and "from 1l. 10s. per week to take sole charge," &c. Now, there is a great deal of truth in this, but there are really good houses, Sir, who must have a first-class printer; for instance, he must know everything in printing and have been in the best houses in the trade, and 1l. 10s. is the magnificent offer—one has just offered 1l. 15s. to a friend of mine, but this was a place where "the best only" is turned out.



No doubt something could be done by having a department in connexion with the various local institutes, where examinations could be held and where certificates could be given which would permit assistants to qualify for good houses, copies of such certificates being sufficient as to a man's abilities.

Specimens would then be a useless item, and deceiving assistants—I should say *business* assistants—would be obliged to "cave in."

With deep apologies for such intrusion on your valuable space,—I am, yours, &c.,  
F. G. WILLIATT.  
101A, Fulham Palace-road, Hammersmith, W., March 20, 1899.

## OPERATORS AND AGREEMENTS.

To the Editors.

GENTLEMEN,—I am glad your correspondent gives publicity to this matter, as these agreements are becoming quite common, and I think operators ought to combine against this kind of thing, which is likely to become a nuisance, and is calculated to create in time an unhealthy feeling between employer and employee.

It is all very well, in some cases, where operators are handsomely paid for signing such agreements, but a salary of 8l. 10s. per week for a first-class man and the signing of such an agreement is simply absurd, and "Operator" has done quite right in exposing the case as a warning to others.

I dare say there are many more operators who wish they could afford to follow his example.

I consider agreements of such a nature want well paying for.—I am, yours, &c.,  
ANOTHER OPERATOR.  
March 14, 1899.

## THE LEEDS CAMERA CLUB AND THE YORKSHIRE PHOTOGRAPHIC UNION.

To the Editors.

GENTLEMEN,—I am sorry that my friend, Mr. Warren, seems to be losing his temper in the letter published in last week's issue.

Sarcasm, however clever, is not argument, and the latter is conspicuous by its absence throughout the whole of that effusion. To ignore an opponent's arguments and attack him personally may be 'cute policy, but, in my opinion, it is questionable taste, and, to use Mr. Warren's own words, *playing the game too low*.

The air of injured innocence, and the excuse that in attacking the Union Mr. Warren was justifying the position of his Club, are simply convulsing. If the Federation of Societies offers no advantages to, say, the Leeds Camera Club, surely that is no reason why its President should take up a hostile attitude and attack an organization the constitution and aims of which he does not even take the trouble to understand.

I have not attacked the Leeds Camera Club, nor should I think of attacking any club; let each do the best it can for its own interests. As a delegate of the Union, I cannot allow even the President of the Leeds Camera Club to build up beautiful theories on false premises in order to bolster up an illogical position.

In conclusion, I think I may fairly claim that my opponent has been compelled to lower his colours, and the fact that he has run away from all argument is proof that the reasons adduced for the action taken by the Leeds Camera Club are like unto a well-known soap, which has certain merits, but *won't wash*—clothes. Thanking you in anticipation, —I am, yours, &c.,  
EZRA CLOUGH.

13, Chesham-street, Bradford, March 20, 1899.

## ANIMATED PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—I notice in the Correspondence column of your last issue a letter signed "W. Barry" relating to the very tardy recognition of the name of Friese-Greene as a pioneer of animated photography, at the same time hitting out pretty hard against other so-called "inventors."

Now, so far as Mr. Friese-Greene's share of invention of animated photography is concerned, I have on every occasion when delivering a lecture on animated photography (and I have given several dozens extending over more than three years) distinctly named Mr. Friese-Greene's work.

So far as invention is concerned or the original inventor, it is exceedingly difficult to fix on a name. Personally I regard the matter as one of evolution, from the zoetrope. It will be in the recollection of some of your readers that, at the Royal Photographic Society's Exhibition in 1892, I exhibited a series of enlargements entitled "The Story of a Cloud," which illustrated the movements of a cloud, but in this case a comparatively long interval is shown between each picture; but these photographs were really taken with an apparatus for bringing a number of plates  $3\frac{1}{2} \times 3\frac{1}{2}$  in rapid succession behind one lens, my previous efforts with twelve lenses not giving satisfactory results, due to the shortness of the interval and the serious defect of parallax, as explained in my paper read before the Royal Photographic Society last month.

I presented this "Story of a Cloud" to the Royal Photographic Society's Permanent Collection, and it is now on tour, I believe, with the Affiliation-scheme lectures. The prints are carbon enlargements.

I only quote this to show that I, at least, was at work on this subject years before the present boom, and, although I have had the mortification of seeing my work exploited by others, still I have the satisfaction of knowing that I had not stolen ideas from any one.

Apologising for trespassing on your valuable space,—I am, yours, &c.,  
BIRT ACRES.

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

H. M. Whitlock, 319, High-street, West Bromwich.—Photograph of Ruben Farley, Esq.

T. M. Lund, 27, Bridge-street, Kelso, N.B.—Photograph of Charles Rutherford, King of the Gipsies.

T. H. Smelt, Cypress House, Victoria-road, Fleet, Hants.—Cabinet Photograph of W. W. Bruce, Esq., 4, Copthall-buildings, London, E.C., champion croquet player, gold medalist.

F. Coghlan, 31, Carlisle-road, Londonderry.—Two photographs of the Very Rev. Charles McFaul, P.P., Water-side, Londonderry:—1. Cabinet vignette without glasses. 2. Vignette with glasses on.

ELEANOR FIELD (Maidstone).—Sorry we cannot supply such a list. The paper to which you refer is chiefly used by architects and engineers.

J. P. MARSHALL (Buddleigh-Salterton).—If the sitters paid for the photographs, the copyright is theirs, unless it has been assigned to the photographer.

P. R. S.—It would be quite practicable, we think. The material would be found in the British Museum (prints), the Record Office (documents); the Herald's College, &c.

A CHINESE SUBSCRIBER.—Messrs. G. Houghton & Son, 89, High Holborn, and Messrs. W. Watson & Sons, 313, High Holborn, London, W.C., would send you particulars of such cameras.

EMULSION-MAKING.—A. BAKER says: "1. Kindly tell me how to test gelatine for alum. 2. Will potassium bromide that contains potassium chloride give fog in bromide emulsion?—1. There is no simple and reliable test for alum in gelatine. 2. No.

STRETCHING PRINTS.—R. L. E. says: "Please tell me what would be likely to stretch P.O.P., when toned and fixed, without injury to the print."—We know of nothing that would be likely to stretch the paper beyond its normal expansion while wet, though with force it may be stretched a little beyond that. The gelatine will be stretched with the paper without injury.

Mrs. BLAIR.—We regret your last week's communication was overlooked. Your requirements would be met, we think, by the purchase of a hand camera taking rollable films, but it is against our rules to recommend particular makes. If you will procure THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1899, and study the advertisements, you will find almost every type of modern hand camera described.

G. S. C.—1. Sorry, but we cannot recall such a publication. 2. Yes; the focus may be shortened in the manner described, and the results, if the work is not of a very critical character, would be passable; but you would require to cut the mount and experiment with a number of double convex glasses of different powers. We, however, do not advise you thus to interfere with the lens. Better purchase a wide-angle lens outright.

LENS.—R. KIRK. The lens, if it has no name upon the mount, is certainly not by Dallmeyer, whatever you have been told. From the description, we should say it is a French portrait lens of the ordinary type. It may, however, be a very good instrument, but it is of little value commercially, probably under twenty shillings. Plenty of second-hand half-plate French lenses are to be had for even less than that sum, and some of them may be very good.

SILVER STAINS.—L. & J. say: "We should feel greatly obliged if you could inform us what we might do with negative that is covered with silver spots? Having been printed unvarnished during the damp season, the silver from paper has entered the film, making one mass of white spot on present print."—Try the effect of a weak solution of cyanide of potassium. That is the best thing we can suggest, for there is really no satisfactory method of removing these spots if they have been on the film for some time.

LENS FOR HAND CAMERA.—C. BAKER says: "I am desirous of making a half-plate hand camera, but think that, owing to the focal length of ordinary rapid rectilinear lenses, it would make an extraordinary large affair. Would it be possible to use a wide-angle rapid rectilinear in a hand camera? The approximate focus of an ordinary rapid rectilinear is (half-plate) 7 to 8½ inches, and a wide-angle 4½ to nearly 5 inches. The question I should like answered is, Can I use a wide-angle lens in a hand camera for exactly the same sort of work that an ordinary lens is used for?"—In reply: By selecting one of the modern anastigmats a half-plate hand camera can be constructed to take 6½-inch lens, which at f-11 or f-16 will cover the size of plate named. For a quarter-plate camera the lens may be used at full aperture.



**VALUE OF A BUSINESS.**—**SATISFIED** asks: "Will you please inform me how a valuation of a good photographic business is arrived at? Returns, about 900*l.* per annum; rent, 45 guineas; wages list (exclusive of self), 2*l.* 17*s.* 6*d.* weekly; good prices obtained. What sum do you think such a business should sell for?"—In reply: The business must be valued by the net profits, not by the returns. It is obvious that a business with high prices shows a much larger profit than one with medium or low prices. Much also depends upon the opposition in the neighbourhood, as well as the neighbourhood itself—whether an improving one or not.

**SALE OF PHOTOGRAPHIC CHEMICALS.**—**CHEMICALS** says: "I should be glad if you would advise me on the following question: I wish to add a photographic branch to my business, but do not know how far I can go in the sale of chemicals? Could I sell pyro in the ounce bottles, hydroquinone, amitol, and suchlike developers, and could I sell a ready-made developer containing the above chemicals also a ready-made toning solution containing sulphocyanide of ammonium?"—In reply: We take it our correspondent wishes to know his position with regard to the sale of poisons. Let him consult the Poisons Act given in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1899 and he will there see what substances he is (legally) precluded from vending.

**STUDIO BUILDING.**—**F. W. GIBSON** says: "I am exceedingly obliged to you for your reply in last week's issue (March 17). I find out that I can have only 12 feet length by 12 feet breadth for studio construction. Do you think the length is too short for studio work? Also, would a six-inch focus lens be suitable for that length? Would the lens do for groups and full-length cabinet portraits. Last week I asked you how much top light and side light I should require."—Unless you can have a greater length, we should say, Do not build the studio at all, that is, if it is wanted for professional work. The shortest-focus portrait lenses that are made for cabinet and *carte* pictures require from 12 to 13 feet between sitters and lens for full-length figure, and, of course, a still greater length would be required for full-length groups.

**STUDIO BUILDING.**—**LUCERN** says: "I am about to erect a photographic studio, would you kindly answer following: Studio will be 28×15 ft., and have a northern exposure with glass as per sketch; (1) would it give better results in lighting to have top portion clear instead of ground glass? 2. Would white or dark green curtains be better? 3. What would be best colour to paint interior walls? 4. There will be a foot taken off front of studio by a chimney stack as in plan, will that affect light? P.S.—The stack has been lowered to two feet, and chimneys carried up by pipes; but what I wish to know is, will altered plane of the glass affect lighting?"—1. No. 2. We should prefer a rather light green. 3. A pale green and French grey, or any quiet colour that will not try the eyes of the sitter. 4. It will not make a serious difference, though it would be better were it not there.

**LENSES AND PANORAMIC PHOTOGRAPHY.**—**F. V.** says: "Would you kindly inform me what kind of lens would be the best for me to buy? I wish to take some half-plate negatives (landscapes), but I want to get the image as large as possible and less angle of view with as much equality of illumination as is possible, and I want it to cover the plate right sharp up to the edge of the plate. My camera will rack out to fifteen inches. I also want to take a panoramic view. Would you please tell me where I could obtain some information on panoramic photography, as to what lens to use?"—Get a long focus lens—say twelve to fourteen inches, as the camera will extend to fifteen inches. If the lens be used exclusively for landscape work, a single lens will answer quite well, but for general all-round work a rectilinear will be preferable. Several pages are devoted to panoramic photography (by different methods) in the ALMANAC for 1892.

**TEMPORARY SUPPORTS; FIXING ALBUMEN PRINTS.**—**TEMPORARY SUPPORTS** asks: "Could you tell me, (1) What was the cause of a carbon stripping from the 'temporary support'? It was developed, &c., in the usual manner and was hung up in the developing room (which was very steamy and damp), and the next morning it came off; there were others done at the same time which were all right. (2) If albumen prints after fixing were passed through hot water (to get the hypo out of them sooner), would this injure them in any way or alter the tone?"—1. Over-drying the prints might cause the spontaneous stripping, but that would scarcely be the case in this instance, seeing that others did not come off. Possibly in the one case there was too much of the waxing compound left upon the support, or that the solvents had not thoroughly evaporated before the tissue was squeegeed upon it. 2. Not if the prints were well toned with gold, unless, indeed, the water was used unduly hot.

**DETENTION OF SPECIMENS.**—**ASSISTANT** says: "I have read with interest in your paper one or two letters from assistants who seem to be in the same box as myself. Like your other correspondents, I answer three or four advertisements every week, and am getting quite used to receiving no replies. I begin to think, like others, that either the trade is overcrowded or the advertisers are humbugs. The unkindest cut of all is the following, and I should be pleased if you could give me any advice. In your issue of February 24, I saw an advertisement from — for a general assistant, asking for lowest terms, references, specimens, and photograph of self. These I sent, and also stamps for return postage, and from that day to now I have not heard another word from him, although I have written him twice, asking for return of specimens. I consider it a very mean trick to deprive a man of his one means of getting another situation, and should like your advice as to any means of recovering them. I sincerely trust, for the honour of the profession, that there are not many men who would do such a thing, and hope none of your readers have been the victims of these 'humbug' advertisements."—In reply: This seems a hard case. We should think a threat of legal proceedings would result in the return of the specimens.

**CARBON PRINTING.**—**H. WALLACE.** The cause of the tissue refusing to adhere to the single transfer paper, if you have proceeded precisely as you say, is due to the tissue being insoluble. That you can easily test for yourself by placing a piece in water, temperature 100° Fahr. If it does not quickly dissolve, it is no use attempting to use it. If it does dissolve, the fault must be somewhere else; probably it is left too long in the cold water before it is squeegeed on to the transfer paper.

**STUDIO BUILDING.**—**A. FLINT** says: "In building a studio 25 feet×14 feet, glass on north side only, what would be the correct height to eaves and to the ridge? Also what would be the best material for blinds?"—In reply: About 7 feet or 7 feet 6 inches to the eaves, and about 12 feet or a little more to the ridge. As the studio will be lighted entirely from the north, have pale green or a darkish blue for the blinds. Ordinary window holland is as good a material as anything for the purpose.

**LANTERN SCREENS.**—**PHOTOPHYLAX** writes: "I should be very much helped if you would tell me the best way to coat calico for a magic-lantern screen, the main points being (1) opacity; (2) whiteness, and permanence of the whiteness; (3) suppleness, for rolling up. What, amongst the materials obtainable in most places, would form the best mixture for coating the textile? How many coats should be given? To work could would be easier. White paint is expensive, heavy, and turns yellow, and takes long to dry. Lime or chalk seems to crack off, and is also perhaps apt to rot the fabric. Should the calico be stretched before whitening? It would be about five yards long."—We do not know of anything better than white paint, with just a very slight tint of blue with it, for the purpose, all things considered. The Vanguard Company, Maidenhead, supply a material that, no doubt, will answer the purpose. The fabric should be stretched on a frame before the coating (whatever it may be) is applied.

**ANILINE.**—**ANILINE** says: "I have a quantity of the base of aniline, mauve or purple, in dry state; looks like bronze, but, when dissolved in spirit, it is a very rich mauve or purple. Now, if you mix it up with water, it is a very dull colour, no transparency about it, and as though black was added to it, but, the moment dissolved in spirit, it is rich. Can you kindly inform me what I can add to it to make in a liquid form to write with? Spirit would evaporate too soon whilst using. If I recollect right, it is a fact they can prepare aniline dyes either to be dissolved in water to fetch the rich colour or not, and only spirit to fetch out the proper tint."—Some of the aniline colours are soluble in water, and some are not, or only partially so, and we suspect the one in question is of the latter kind. Not knowing, from the description, which particular dye is referred to, we cannot answer the query. Any of those who supply coal-tar colours will supply many of them that are soluble in water alone.

**A MASTER'S GRIEVANCE.**—**A. A.** writes: "I took a young fellow as an apprentice, with not a very large premium, for three years. I have taught him printing—P.O.P., C.C., platinotype, and albumen, toning, mounting, and all that, and he has done all my work in that way for nearly two years. Now his father is complaining that he is not working at taking sitters, and threatening all manner of things. Of course, I cannot have him taking portraits of sitters in the studio, as I did not bargain for that. I only took him as an apprentice to learn photography."—As you undertook to teach the apprentice the trade of a photographer, you must do so, and taking portraits is the most important part in it. We are afraid you are like too many others, who take apprentices, with a premium, merely to get the printing and suchlike done for nominal wages, or none at all, without the intention of really teaching them their trade. However, it is incumbent on you to do so, and you will have to do it or take the consequences—no mean ones—in a court of law.

**CARBON PRINTING.**—**AZAY** says: "Will you kindly give me a hint how to avoid bubbles and blisters in carbon printing on rough-surfaced single transfer paper? I have read Mr. Sawyer's book and Mr. E. J. Wall's book on the process, and carefully done the things advised and left undone the things condemned. Still there are bubbles or blisters on every print made. Some are worse than others, but not one wholly escapes. The paper I have been using is the Autotype Company's toned etching paper, and the thick Whatman drawing paper supplied by the same Company for single transfer. I duly leave the transfer paper in water of the required temperature for the required time before mounting, and I leave the mounted tissue for the required time between blotting paper under heavy weight before developing. I use a scraper squeegee. The bubbles or blisters are not round the edges, or I should conclude a defect in the safe-edge. They are generally about half way towards the centre. I have never had this trouble in the smallest degree with ordinary smooth single-transfer paper, so that the defect, whatever it is, can hardly be traced to the tissue. Giving the same care to the rough paper as to the smooth, the only difference being the longer time of immersion for the transfer paper before mounting, and the longer time after mounting and before development, I get in every rough-paper print some blister or bubble, in no smooth paper print a single one. Can you suggest a reason why?"—The trouble is evidently due to air being imprisoned between the transfer paper and tissue in the squeegeeing. The air, in the first instance, is doubtless in the interstices of the rough paper. See that it is thoroughly removed from these while in the water, by going over the surface with the fingers or a soft piece of sponge then bring the tissue and paper into contact (while under water), and, when removed, apply the squeegee with some force.

\* \* Several answers to correspondents unavoidably held over.



# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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## EX CATHEDRA.

PROBABLY no boat-race day opened more propitiously for photography than did Saturday last. Probably also, on no previous occasion, notwithstanding the cold, were so many hand cameras to be seen along the tow path, or so many cinematograph apparatuses planted at the best points of view. Unfortunately, however, about the time of the start the sky became somewhat cloudy, and for the greater part of the morning brightness disappeared. However, we are given to understand that several very successful cinematograph negatives of the event were secured, though they have scarcely the brilliancy and sparkle they would have had if the sun had retained its morning's brightness at the time they were taken. Mr. Charles Morton, of the Palace Theatre, again showed with what accuracy, rapidity, and clearness the race could be illustrated by the biograph, which at this establishment is always up to date. By night he was quite ready to give a representation of the earlier stage of the contest between the two crews. The picture was taken from the referee's boat, and the excellent result justified the privilege accorded Mr. Morton's artists.

About eleven at night a densely crowded audience, quick to applaud every reference made on the stage to the race, witnessed the start with much more comfort than if they had been standing on the river-banks, and they loudly cheered the boats depicted as struggling through the lumpy water. The picture, we believe, was subsequently added to. A success on the biograph was also achieved on Friday with a picture of the finish of the race for the Grand National.

\* \* \*

IN some cases in the Law Courts Judges have refused to accept photographic portraits as evidence of identification. In other cases they have been admitted as a conclusive proof. Last week, at the inquest on the body of the victim of the Whitfield-street murder, a witness identified it as her sister from a photograph taken after death. The coroner said to the witness that if she had the slightest doubt in the matter he would have the body exhumed at once, but she had not. The jury clearly accepted this photograph as evidence, for in returning their verdict they found that the body was that of the witness's sister; but in this instance the photographic evidence was somewhat corroborated by the deceased's clothing found in the room, which was recognised by the sister. Here is an instance where a photograph taken after death was accepted as conclusive evidence of identity.

\* \* \*

It is not often that a cinematograph accident is considered to be advantageous. A correspondent, however, sends us a cutting from a local paper of the report of the Chiswick Overseers' meeting last week. From that it appears that the vestry hall keeper inquired what the Overseers would do with regard to the letting of the hall for cinematograph shows, as "they were very dangerous, and there was no appliance in the hall for them. They might explode and set the place on fire." The chairman is reported to have replied: "If it was only for the destruction of the hall, I should vote for it." From this it would seem that some persons look upon a cinematograph accident more as a blessing than anything else, when it would lead to the destruction of one hall to make room for a better. In the end, however, the hall keeper was instructed to accept no applications for that class of entertainment, so that there is no immediate prospect of the Chiswick Vestry Hall being destroyed by the cinematograph.



THERE appears very little chance of the Government taking steps to make the metric system compulsory. Mr. Ritchie, President of the Board of Trade, met a deputation last week at the House of Commons, who came to urge upon him the necessity of a compulsory metric system of weights and measures in this country. The deputation was large and thoroughly representative of commerce, science, teaching, and labour. Sir Samuel Montagu, M.P., in introducing the deputation, said what they proposed was that the Board should negotiate with the United States for a simultaneous adoption of the metric system. A permissive Act was of no use; the system must be made compulsory.

\* \* \*

MR. RITCHIE, in replying, said that, in his opinion, the arguments used in favour of the metric system could not be controverted. The great bulk of scientific opinion was on the side of the deputation. But that was not a question which they had to discuss that day. The real question was whether or not the metric system was the more suitable system for the transactions which are carried on all over this country. It had always been legal for scientific research, and in 1897 an Act was passed which made it legal for external trade. Mr. Ritchie said he entirely agreed with Sir Samuel Montagu's views as to the importance of the question to the external trade of the country, and, indeed, it would be impossible to take any other view, and there was no reason why those who deal with foreign merchants should not adopt the metrical system at once. But a suggestion had been made that within two years the system should be made compulsory in the internal trade of the country. He would like to point out that previous deputations had waited upon Ministers, and that in all cases the same reply had been given. Whilst these replies had been sympathetic, Ministers had declined to make the system compulsory in this country. There would be great difficulties in the way of its adoption by the small trader, and the chaos and confusion created by its compulsory adoption would be so great that he feared it would be impossible to carry out the law. He was afraid, therefore, he could not promise to introduce a measure to make the metric system compulsory in this country. Here, therefore, matters must be left, we fear; and future effort it is plain must be concentrated in the direction of securing voluntary adherence to the system.

\* \* \*

ACCORDING to a correspondent of the *Daily Graphic* another place of great historic interest is to be demolished. Sutton Court Estate and house, Chiswick, has recently been sold for building purposes. It is on record that the manor of Sutton was in the possession of the Dean and Chapter of St. Paul's in the reign of the Conqueror, and that the talented lawyer, Challoner Chute, resided there in 1639, and he was succeeded by one of Cromwell's daughters, who lived there for some years. Little of the original house, however, now remains, as it was almost rebuilt during the end of the last century. Still the place as it is now is of historic interest, and those who desire to secure photographs of it should lose no time in obtaining them, or they may be too late. There are many picturesque spots in old Chiswick, but they are fast disappearing at the hands of the speculative builder. Two or three weeks back we referred to the approaching demolition of Kew Bridge and the threatened "improvements" of that picturesque

little spot, Strand-on-the-Green, though up to the present nothing has been done. It is still the happy hunting-ground of artists and some photographers.

\* \* \*

EVIDENTLY the spy scare in France has not subsided, neither is it confined to the frontiers. A Dalziel's Paris telegram of Friday last tells us that three students of the Ecole des Beaux-Arts were arrested at Chars. One of them is an American, and this, together with the fact that all three took a number of photographs, caused them to be suspected. The Mayor ordered them to be arrested, and they were confined for several hours in an uncomfortable lock-up before the village authorities would listen to their explanations. Finally, the mistake was admitted, and the young fellows were released, with profuse apologies for the mistake. We mention this circumstance for the purpose of putting English photographic tourists on their guard while travelling in France, as many may be doing this Easter. It will not be pleasant for them to have their holiday curtailed by several hours' confinement in village lock-ups, which, we understand, are by no means such pleasant quarters as are to be found in a good hotel. Even profuse apologies, when rendered, are not a recompense for the inconvenience suffered or the indignity conferred by several hours' detention in *durance vile*.

\* \* \*

WE have received the Annual Report of the Liverpool Amateur Photographic Association. A glance through the fifty-eight pages of the volume is sufficient to show that the Association, which dates back to the year 1864, is in a very prosperous state, numbering 326 members. In the "list of officers of past years," which is printed in the report, occur the names of many of those who thirty odd years ago made Liverpool perhaps the most important photographic centre in England. The Association has a good library, rents its own rooms, gets through a great deal of useful photographic work in the course of the year, and is at present presided over by the popular Paul Lange. We congratulate the Association on its present proud position, and trust it may long thrive.

\* \* \*

WE are pleased to receive from the Rajputana Stereoscopic Works, Ajmere, a catalogue of stereoscopic views and lantern slides of Indian views. The catalogue extends to a hundred pages, and lists many hundreds of subjects taken in various parts of India, which, of course, supplies a practically illimitable field for stereoscopic work. Those of our readers concerned in stereoscopy may be interested in knowing of the existence of this catalogue, which is prefaced by some remarks on stereoscopic pictures and the stereoscope that are not acknowledged to their source, namely, W. L. Chadwick's *Stereoscopic Manual*.

\* \* \*

THE Directors of Kodak, Limited, have declared an *interim* dividend upon the preference shares at the rate of 6 per cent. per annum for the period ending 31st inst., and the same will be payable on and after April 1 next. The Directors have also declared an *interim* dividend upon the ordinary shares of 2½ per cent. for the quarter ending the 31st inst. (being at the rate of 10 per cent. per annum) and the same will be payable on or about April 1 next.

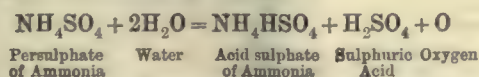


THE Autotype Company, of 74, New Oxford-street, W., are issuing two little publications relating to carbon printing which will be of the greatest use to all those interested in the making of photographic prints by the pigmentary process. The first of these is *Carbon Printing in the Tropics*, by Colonel J. Waterhouse, I.S.C., in which the author draws upon his unique experiences of photography in India for the purpose of minutely detailing the special conditions which the carbon printer has to deal with in the Tropics. To those who have to work the carbon process in climates where the extremes of temperature and other abnormal natural conditions are encountered, Colonel Waterhouse's valuable notes of his experiences will prove of very great informative use. The second pamphlet which the Autotype Company send us is entitled *First Steps in Autotype Printing*, and it appeals to the beginner in carbon work, who will find it a simply written introductory guide to the process. We can cordially recommend both pamphlets, which are priced respectively sixpence and three-pence.

### THE ACTION OF THE PERSULPHATES ON THE PHOTOGRAPHIC IMAGE.

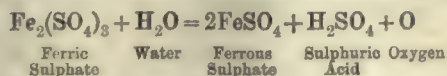
SINCE the introduction of persulphate of ammonia by MM. Lumière Frères as an agent for reducing negatives, a good deal of mystery seems to have hovered round that and similar substances so far, at least, as regards their action upon the negative image. We say "similar substances" because we are well aware that the recently introduced persulphates, or salts of persulphuric acid, as it pleases some to call them, are said to be of entirely different composition and construction from other so-called persulphates—that of iron for instance, which, as well as the double salts, known as "iron alums," we have used for many years, for reducing or removing the image from collodion films. But an analysis of their relative compositions will, we think, show that for practical purposes, at least, they are identical, and certainly their separate actions do not differ much.

Let us take first of all persulphate of ammonia, which in the dry state is physically totally different from either the acid or the normal sulphates; but, when it is dissolved in water, it undoubtedly decomposes, and there can be little doubt but that the final result is something like this:—



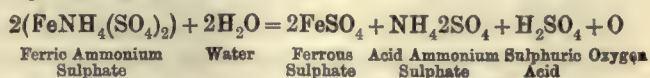
In other words, the persulphate splits up into bisulphate, and sulphuric acid and oxygen are liberated, the latter of which, no doubt, forms hydroxyl with another portion of the water.

Next, look at the composition of ferric sulphate, also formerly called persulphate of iron. The simplest analysis of this formula shows it to consist of two equivalents of ferrous sulphate in combination with one each of sulphuric anhydride and of oxygen; but in solution we have the following equation:—

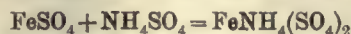


or, so far as the active constituents for reduction purposes are concerned, precisely similar to persulphate of ammonia. Turning finally to the iron alums, of which we may conveniently take the ammonium salt as the type, more especially as it is at once the most permanent and the most useful, we

do not find any material difference. Leaving out the water of crystallisation, we have



An examination of the latter part of this equation will show that it only differs from the previous one in having an equivalent of neutral ammonium sulphate thrown in as useless ballast and, eliminating the ferrous sulphate, we have the formula for persulphate of ammonium *plus* water. From which it will be gathered that ammonia iron alum, for experimental purposes, may be conveniently made by mixing ferrous sulphate and ammonium persulphate in equivalent proportions.—



and if such a solution be made it will not act differently, either for better or worse, on a collodion plate than one containing the same quantity of persulphate alone.

From a purely photographic point of view, then, it can scarcely be doubted that the action of these three different salts is identical, although chemists may choose to class them differently, and it might be further assumed that the cheaper iron salts were as useful as the newer agent. Such, however, is far from being the case; for, as was pointed out on its first introduction, the special beauty of the ammonium persulphate as an oxidiser and reducer of negatives lay in the fact that its properties were not marred by the formation of any by-products. When some eighteen years ago, at a meeting of the Photographic Club, Mr. Warnerke first introduced ferric sulphate, or, as he then called it, persulphate of iron, as a solvent of silver, great things were expected of it. But it soon turned out that, when applied to a gelatine plate, it stains the film indelibly yellow, and when used, as it was attempted, to remove the developed image before fixing in order to make a reverse negative, it deposits a yellow iron salt in place of the silver removed. These objections do not hold good with regard to collodion plates, and for all purposes where such are concerned the iron persulphate may be used with equal advantage to the ammonium salt.

There seem to be at present insuperable objections to the theory put forward by Messrs. Lumière to explain the special reducing action of persulphate of ammonia; but two facts seem to be beyond doubt, namely, that the solution possesses a reducing action upon salts of silver as well as a solvent action on the metal itself. The same occurs with the iron salts mentioned; if silver be dissolved, it is in a short time precipitated in a beautifully fine powder, in the case of ferric sulphate of a brilliant whiteness almost equalling the polished metal. The two actions go on simultaneously and continuously, as may be proved by shaking up freshly precipitated silver with either of the solutions for some time. The original greyish-black colour gives place to a nearly pure white, resembling a good iron-developed collodion image, and the powder becomes much finer. On one occasion we suspended a small "button" of pure silver in a flask of persulphate of iron, and in the course of a few days it had entirely disappeared, and a layer of brilliantly white metal covered the bottom of the flask.

There is another remarkable fact worth mentioning in connexion with the iron salts, namely, that, acting upon pure silver or on a collodion image, there is practically no deposition of basic ferric oxide, none, at any rate, beyond what might be expected to take place from the gradual passage of the iron to



a higher state of oxidation. But, directly the solution is applied to a gelatine negative, there is a copious deposition of the yellow powder, both on the film in the solution, and more slowly, in the film itself. This points almost undoubtedly to some special action of or on the gelatine, and may, in a measure, account for Liesegang's observation of the formation of a relief image on a gelatine plate by means of persulphate of ammonia.

As to the precise nature of the action upon a negative image, the solvent power of ammonium persulphate sufficiently accounts for that; but why it acts more forcibly on the high lights is not so clear. It seems to us reasonable enough, however, that, contemporaneously with the solution of the silver, a sort of physical redevelopment process goes on on the surface, which results in that portion of the image always remaining practically the same, until at least the action has continued long enough to dissolve the whole of the silver and leave no nucleus on which to redeposit it. Then we imagine there would be a slow and gradual deposition over the whole surface of the gelatine. This is, to all intents and purposes, Messrs. Lumière's explanation, and perfectly accounts for the selective reduction which, as Mr. John Sterry has pointed out, is actually a gradual undoing of development, the process proceeding upwards from the under side of the film.

Recent researches on the action of hydroxyl on silver salts would point to that as the undoubted reducing agent.

**Healthful Dark Rooms.**—In the old wet-plate days, when the fumes of collodion were so strong as to force themselves into notice, some effort was generally made to secure ventilation of a sort; but at the present time, when the chemical manipulations do not result in any evident deterioration of the atmosphere, the question of ventilation is rarely considered. But with the more prevalent use of gas as an illuminant it is highly advisable for those whose duties keep them for any considerable time in that room to see that the products of the combustion of gas are conveyed away as perfectly as possible. There are, as every one should know, distinct ill effects produced by the breathing of air contaminated with carbonic acid, which is one inevitable product. If carbon monoxide is also produced, as has been confidently asserted by some, the danger is very real—very insidious. The former mostly acts by reducing the proportion of oxygen, the latter is a distinct and deadly poison. We are, however, able, on the authority of Professor Grehant, who has been investigating the subjects of the result of combustion of coal gas under different conditions, to state that, under ordinary average conditions, carbon monoxide is not produced. Thus, with a common bat's-wing burner, the quantity found was so small that it could not be stated that it was not due to experimental error. But it is well to note that, when a gas flame strikes an object within a certain distance, the noxious gas is produced; hence no vessel should be heated by a naked gas flame in any room unless it is thoroughly well ventilated.

**Another New Incandescent Lamp.**—Still another electric lamp with luminous filament has been brought before the public, and from all accounts promises very highly. All users of this kind of lamp are too familiar with the fact that the higher the efficiency of an incandescent lamp the higher the illumination at the outset, and also the quicker the process of blackening the bulb and reduction of original intensity of light. It is asserted that in this new lamp of Herr Langhan's there is, however, a combination of high efficiency and freedom from blackening of bulb and of reduction of candle power. It has been run for from 600 to 800 hours, starting with an efficiency of about 3.1 watts per candle power, without any reduction of light-giving power, and the bulbs have not blackened. If all this be true, it is evident that through the advantages of increased light for a given consumption of electricity,

and there being less need for repeated change of lamps, considerable economy should result from the use of Herr Langhan's lamp. We read that the ordinary carbon filament of the glow lamp is in this case replaced by a filament of carbide of silicon and carbon, coated with silicon and carbon by the usual flashing process. The advent of such a lamp as this would be hailed as a boon by the users of the now common form of studio electric illuminant—the umbrella-shaped reflector faced with a row or rows of glow lamps, as it is obvious that the gradual diminution in illuminating capacity of the arrangement may, in the hands of those unfamiliar with the properties of incandescent lamps, easily occur without the knowledge of the user, and so perhaps the plate-makers be blamed for slowness of plates while the lamps only are to blame.

WITH regard to the Nernst lamp, which we have before described, and of which so much is expected, some details of the specifications of the patents have been published, and from them we learn that Herr Nernst finds that oxides of certain of the rare earths—magnesium, beryllium, thorium, and yttria—though of high resistance alone, may, when two of them are mixed, alone or with other substances, convey the electric current much more readily. The resistance of pure magnesian oxide was very high, but the addition of a small quantity of calcic chloride or of tungstic or boric acid so brought it down that a pressure of 100 volts served to produce incandescence when the filament was simply heated with the flame of a match. That the life of the filament might be prolonged as much as possible, the inventor found that metallic oxides only should be used, the particular form he preferred being as follows: zirconia, 95 per cent., and yttria, 5 per cent.; or thorina, 80 per cent., and yttria, 20 per cent.; or thorina, 94.7; zirconia, 3; yttria, 3; and ceria, 0.3 per cent. It seems very probable that we are really on the eve of a revolution in glow-lamp illumination.

**Photographing the Corona without an Eclipse.**—Signor A. Ricco, Director of the Catania Observatory, and others have been engaged for the last four years in attempting to obtain photographs of the solar corona without the aid of a solar eclipse. This observer in brief states that, though certain results have been obtained, there is no certainty that they are photographs of the corona. In the Belgian Society's *Journal* he gives a history of these various attempts illustrated by reproductions of the photographs obtained by various kinds of apparatus, and he shows that the only appearance produced is a sort of graduated halation, radiating equally in all directions from the solar disc. This is not to be wondered at. The only method that could possibly succeed would be one that would eliminate the whole of the light reflected and refracted by those particles always present more or less in the atmosphere between the region of the sun and the telescope. Seeing that these must consist more or less of radiations of all wavelengths, the problem is one which "passes the wit of man" to solve. It is possible that there may be heights of atmosphere beyond which the air is absolutely mote-free, and, if a telescope could be placed there and automatically worked in conjunction with a photographic arrangement, corona photographs might be obtained, but, so far, outside the works of Jules Verne, such regions have been and are likely to remain untenanted by either living beings or mammoth optical arrangements.

#### THE LATENT IMAGE AND THE NASCENT SILVER THEORY.

[Translated from the *Archiv für Wissenschaftliche Photographie*.]

We find, without exception, in text-books of photography, the view expressed that the substance produced by the direct action of light upon silver haloid is a silver sub-haloid. It is difficult to ascertain, in the present condition of photographic literature, who originated this theory, and upon what grounds it was based. We also find the same theory adopted in Eder's *Ausführliches Handbuch*, and its harmony with our experience is demonstrated. The theory that the substance of the latent image consists of metallic silver is likewise mentioned in the same work, but it is dismissed as unsatisfactory, without advancing any facts in



opposition. My object in submitting the following considerations is to show that the latter theory should be adopted as more probable.

1. We must bear in mind that, with the exception of sub-fluoride, the sub-haloids of silver are combinations whose existence is merely indicated, and their behaviour is such that, with equal probability, they may be said to consist of a mixture of normal haloid and metallic silver. Their indifference to nitric acid is the only reaction, which is opposed to the view that these substances, known as sub-haloids, contain an admixture of free silver, and it is not conclusive. It also appears, as might be proved by experiment, that the capacity of an exposed plate for development is almost destroyed by immersion in a bath of dilute nitric acid. This phenomenon is explicable if the substance of the latent image is metallic silver, but, if it is sub-bromide of silver, the impression formed by light should, on the contrary, withstand the action of nitric acid. It is evident that the well-known fact of the destruction of the latent image by the halogens is in consonance with both theories. The view that the image consists of metallic silver we shall briefly call the Nascent Silver Theory (*Silberkeimtheorie*), and, in addition to the above-mentioned proof in its favour, a series of observations, collected from the literature of the subject, may also be cited.

2. Eder observed, in 1880, that upon touching an unexposed plate, immersed in developer, with a silver wire, reduction took place where there was contact. In this instance it is certain that metallic silver is the cause of extensive reduction of unexposed silver halogen contained in the film, and that the reduction takes place continuously, adjacent to the nascent silver which is first formed.

3. If the sub-haloid theory is carried to its logical conclusions, the activity of nascent silver must also be admitted, for, as soon as the sub-haloid, supposed to have been formed by light action, has been reduced to silver by the developer, any further strengthening of the image must be brought about by the formation of nascent silver. This strengthening of the image when the nascent silver is formed, and which takes place proportional to its quality, is a further proof of the nascent silver theory.

4. The experiments of Abney also testify very conclusively in the same manner. A negative, if coated with unexposed emulsion, may be intensified by development. Reduction of the silver bromide begins in the vicinity of the silver particles of the original negative. This agrees with the nascent silver theory, and in this instance there cannot be any question of the formation of a sub-haloid. The same explanation also accounts for another similar experiment made by Abney, in which an image is developed in an unexposed film coated upon an exposed but undeveloped plate. The image develops simultaneously in the exposed and unexposed films, but it should be noted that the image is stronger in the upper than the lower film, which gives further support to the nascent silver theory. It shows, in the first place, that the exposed film is not specially predisposed to development; and, secondly, that reduction is proportional to the strength of the developer, and spreads in all directions from the nascent silver at the contact of both films. In the upper film, where the fresh developer is active, the image is more vigorous than in the lower film, which is not permeated by the developer until some strength has been lost. An explanation of these phenomena has recently been offered by recourse to a quite incomprehensible theory of electro-magnetic light, Faradaic induction, dielectrics, &c., but the results of Abney's experiments might be predicted with certainty in every detail by the nascent silver theory, without resorting to any such scientific monstrosities. A beautiful confirmation is also presented in a counter experiment made by Eder, at Bredig's suggestion. If an exposed, but undeveloped plate, is coated with a film of gelatine free from silver haloid, and then with a film of unexposed emulsion, the image develops only in the lowest film, where the exposure was made. It is evident that the interposed film of gelatine deprives the top film of contact with the nascent silver.

5. An opinion has recently been expressed by Guébbardt that the sensitiveness of rapid plates is due to presence, before exposure, of a slight amount of fog. This would be nascent silver. What we have said seems to confirm this. The ripening process, which renders the emulsion sensitive, would, therefore, seem to be productive of nascent silver through the slightly reducing power of the gelatine. This at the same time elucidates the mechanism of chemical sensitisation, so far as concerns gelatine at least. It should therefore be expected, and experience confirms the fact, that over-ripening produces sufficient nascent silver to render the plate developable without exposure. The plate fogs, and the riper, or more sensitive, the emulsion, the more apparent does the fog become.

The cleaner a plate must work, as for photo-mechanical purposes or transparencies, the less must be the amount of nascent silver due to

chemical sensitisation instead of exposure. Collodion has no reducing power and is not a chemical sensitiser. For this reason collodion and the Daguerreotype plate (wholly unsensitised) fulfil this condition best. Phenomena of ripening are accordingly unknown in the case of collodion emulsion. Ripening has often been described as a modification of the silver bromide, because there is simultaneous increase in the size of the grain. But we learn from observation that difference in the grain is first seen in the developed negative, and almost, if not quite, absent from the undeveloped plate. Silver bromide consequently appears to be unaffected by the ripening process, in so far as it remains silver bromide. Professor Ostwald has informed me by letter that change, by modification of the silver bromide, would appear to be excluded, as its occurrence, being spontaneous, could only produce a more stable modification, less liable to decomposition, which would mean the reverse of ripening. As the presence of gelatine is necessary to the ripening process, its chemical action (formation of nascent silver) must be regarded as the cause of ripening.

6. A phenomenon, which has recently been brought to light again, and which at first sight appears very extraordinary, is the possibility of developing a plate, which has been exposed and then fixed. This is of easy explanation by the nascent silver theory, and might be expected to take place. When an exposed plate is fixed, the nascent silver formed by exposure remains unaffected by the fixing salt, and in the process of physical development must possess the same attraction for silver in the presence of a solution which precipitates silver as an unfixed plate under ordinary development. When considered in this manner, the difference between chemical and physical development becomes one of mere superficial character. In both cases the reducing constituent of the developer produces finely divided metallic silver. This takes place either from the silver salt contained in the film, or added to the developing solution, and the nascent silver, by its attraction,\* forms most deposit where its presence is most abundant. Kogelmann's† discovery has been reinvestigated recently by Neuhaus,‡ who states that physically developed negatives of this kind have a finer and more evenly distributed grain as compared with the coarse negatives obtained by ordinary chemical development. This is in accordance with experience, as we find that negatives by the wet-collodion process, which are also physically developed, are much finer in the grain than those obtained with gelatino-bromide plates. This may perhaps be explained by deposition upon the nascent silver image of a fine even precipitate of silver particles from the solution in physical development, whilst, in the process of chemical development of a gelatine plate, the nascent silver image reduces in their entirety the coarser particles of silver bromide by which it is surrounded. The long series of ingenious experiments instituted by Kogelmann† have also demonstrated that the latent image may consist of metallic silver. Those, however, which made Kogelmann incline to other conclusions are partly inconclusive in their proof, and partly contradicted by Abney's experiments, which have been confirmed by other authors.

7. It is firmly established that the development of the latent image depends upon the presence of nascent silver, and it is therefore preferable to conclude that the nascent silver is formed by the direct action of light, rather than the developer, as required by the sub-haloid theory. The solubility of the substance of the latent image in nitric acid, to which the sub-haloid is indifferent, according to Guntz, is entirely in favour of light being the direct cause of the nascent silver, and this conception is, doubtless, that which most readily agrees with experience.

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#### FOREIGN NEWS AND NOTES.

**The Paper Ring.**—We mentioned a short time ago that the Chemische Fabrik vormals E. Schering had undertaken the manufacture of photographic paper, in conjunction with Felix Schüller, jun., at Burg Gretesch, near Lüstringen, as they were unwilling to comply with the pretensions of the monopolists. They succeeded in producing a suitable paper, but, as the "ring" had made arrangements with the manufacturers who coat the baryta that they should use none but "ring" paper, it was necessary to overcome the difficulties of this process also. The Chemische Fabrik had just placed

\* The nature of this attraction need not be discussed here, but, from various observations, it may be taken as not exclusively associated with silver, as, for instance, the intensification of platinotypes by a fine deposit of platinum, the silver intensification process, the deposition of precipitates upon rough surfaces, &c.

† Die Isolirung der Substanz des latenten Photographischen Bildes. Gratz: 1894.

‡ Photographische Rundschau, 1893, vol. xii. p. 257.



upon the market a celloidine paper of their own manufacture throughout, and the *Deutsche Photographen Zeitung* speaks in very high terms of praise of the quality. We trust the Chemische Fabrik will see its way clear to supply other manufacturers with paper, and thus bring the "ring" to its knees.

**The Photographs of Bismarck.**—The *Photographische Chronik* mentions that the photographers, Wilcke & Puëster, of Hamburg, who secured photographs of the late Prince Bismarck after death, have been ordered to deliver up the negatives to the family to be destroyed. They have also been forbidden to publish copies under penalty of six months' imprisonment for each offence.

**Xylolith.**—An Austrian firm has brought out a material under this name, which should be of great value for studio floors if it is reasonable in price and possesses the qualities claimed for it. It is formed by mixing sawdust with calcined magnesias and mixing it to a paste with a solution of magnesium chloride. In this state it may be used for coating floors, or it may be made into sheets or tiles. It is very tough and hard, does not burn, and carbonises only at very high temperatures. It is a bad conductor of heat, withstands moisture and dilute acids, and its specific gravity is 1.5.

**Cleaning Mirrors.**—The *Photographische Chronik* gives the following directions in answer to a correspondent. The mirror should be placed upon a thick metal plate and slowly warmed, to drive off any moisture on the silver film. Should any moisture be present, the slightest touch would injure the mirror. The wash-leather used for polishing should also be warmed for some time before use, and should be perfectly clean. A trace of English rouge, such as used by goldsmiths, should be rubbed on the warm leather, and the mirror may then be repolished with the leather by gentle rubbing in a circular direction.

**Backing Plates.**—The *Photographische Chronik* recommends the following, as a good backing for dry plates, to those who object to the stickiness and stain of most compounds used for the purpose. Take 15 grammes of clean Castilian soap scraped to a powder, and add to it 800 c. c. of strong alcohol; well stir it, and let it stand eight or ten days; filter through paper and dissolve 3 grammes of erythrosine and 3 grammes of aurine in the solution. The liquid should be applied to the back of the plate with a brush or sponge, and it dries instantly. It may be removed with a wad of wet blotting-paper.

**Coloured Screens.**—A simple method by which these can be made is given in the *Bulletin de la Société Française*. Take an iron ring that will fit the hood of the lens, clean it perfectly, and place it on the surface of some mercury in a saucer. The ring will float upon the mercury. Stain some suitable collodion, and pour it into the ring. Cover with a sheet of paper, to preserve the film from dust until dry.

**Glycin.**—Dr. Eder gives the following directions, in the *Photographische Correspondenz*, for the preparation of a thick concentrated solution that will keep well. Dissolve 25 grammes of sulphite of soda in 40 c. c. of water in a dish by heat, add 10 grammes of glycin, heat to boiling point, and add at intervals 50 grammes of carbonate of potash. A somewhat thick solution is formed with effervescence and liberation of carbonic acid. When cold, pour into a glass measure, and, if necessary, add sufficient water to make up to 75 c. c.; store in stoppered bottle. For use, dilute with 12 parts of water. For stand development, add 50 parts of water. A ten per cent. solution of potassium bromide is a useful restrainer. Caustic potash may be used as an accelerator, but is seldom necessary.

#### OZOTYPE.

This process of printing, due to Mr. Thomas Manly, is described by the inventor in the Patent specification. Mr. Manly says:—

I coat in any convenient way paper, or other suitable material, with an aqueous solution (which I shall hereafter refer to as the sensitising solution) containing the following ingredients, namely, the bichromate salts, or chromic acid, or other similar light-sensitive compounds of chromium, manganous sulphate, or manganous chloride, or other manganous salts, and a preservative, such as boric acid and aluminium sulphate or alum, mixed together in suitable proportions.

In place of the above-mentioned salts of manganese, the cupric, cobaltous, and nickel salts, and other metallic salts capable of giving oxides on exposure to light in presence of the light-sensitive compounds of chromium may be used. After the paper or other material thus prepared and rendered sensitive to light has been dried, it is exposed to light under a negative or other screen, producing a brown positive image in manganic oxide or manganese dioxide. The printed paper, or other material, is cleared of all the unchanged salts by washing in water, and will be hereinafter referred to as the print.

In order to produce a picture or image in pigment, I adopt either of the following methods:—

1. I take paper coated with pigmented gelatine commonly called carbon tissue, and proceed as follows:—

I dip the carbon tissue for about one minute and a half, or thereabout, in a weak solution of acetic acid and hydroquinone, or of acetic acid, hydroquinone, and ferrous sulphate, which I will hereafter refer to as the acetic solution. At the expiration of one and a half minute, or thereabout, I take the washed print and, having given it a coating of a two per cent. solution of gelatine, I plunge it under the surface of the acetic solution, and bring it in contact with the surface of the carbon tissue. I then draw the print (with the carbon tissue clinging thereto) out of the solution and squeeze them together on a flat surface. After surface-drying, they are hung up to dry. When quite dry, I place the print, with its adherent carbon tissue, in cold water for about half an hour. It is then ready for development, which is performed by placing it in water at a temperature of 43° C., or thereabout, removing the backing of the carbon tissue, and washing away those parts not rendered insoluble by the action of the manganic oxide, thus giving an image in pigmented gelatine.

2. Or I coat the washed and dried print with a hot solution of pigmented or coloured gelatine, using preferably such a solution as is used in the preparation of carbon tissue, and, as soon as the gelatine coating is dry, I dip the print thus treated for about one minute in the acetic solution above referred to. I now hang the pigmented print up to dry, and, when thoroughly dry, I develop the image by dissolving in water, at a temperature of 43° C., or thereabout, those portions of the gelatine coating not rendered insoluble by the action of the manganic oxide.

In order to produce an image in aniline colours, I dip the washed print in the following solution:—

Aniline hydrochloride .....	about 20 grammes,
Sulphuric acid .....	" 2 c. c.
Water .....	" 300 "

which converts the image into a green colour. If the image is treated with a weak solution of ammonia, a purple image is produced: and, if chloride or bromide of copper be added to the above-described aniline solution, a dark blue image is the result.

Other substances, such as various phenol derivatives and amido-phenols giving colour on oxidation, will produce coloured images.

In preparing the sensitising solution mentioned above, I use by preference the following formula, coating the material twice with same.

The under-mentioned solutions are first prepared separately:—

A. A saturated aqueous solution of potassium bichromate, to which has been added as much boric acid as it will dissolve at a temperature of 16° C., or thereabout.

B. Manganous sulphate .....	25 parts to 100 parts distilled water.
C. Manganous chloride .....	25 " 100 "
D. Aluminium sulphate .....	25 " 100 "
E. Dextrine or gum arabic .....	1 part to 2 " "

To make a solution for sensitising paper or other material, the above-mentioned solutions are mixed in the following proportions:—

A. ....	10 parts.
B. ....	4 "
C. ....	2 "
D. ....	1 part.
E. ....	1 "

The following is a formula for the acetic solution already referred to; but so much depends upon the character of the negative and the constitution of commercial carbon tissue, that the ingredients may have to be modified in quantity to produce the best results:—

Magnesium sulphate .....	10 grammes.
Glacial acetic acid .....	8 c. c.
Hydroquinone .....	2 grammes.
Ferrous sulphate .....	25 or 1/2 gramme.
Water .....	1000 c. c., or 1 litre.

Other reducing agents may be used in place of the hydroquinone, such as pyrogallol, in some cases.

In the case of prints to be subsequently treated with pigmented gelatine in the form of carbon tissue, I claim the following advantages over other similar known processes, namely:—

1. The image is visible during the progress of printing, and when washed is permanent.

2. The picture being produced on the material, where it will permanently remain, does not become reversed in the operation, as in the present method of carbon printing.



3. No precaution need be taken to guard against the edges of the picture washing up during development.

4. As it is necessary that the chromic salts should be thoroughly washed out of the print before development, the hands of the operator do not come in contact with any deleterious solution.

5. No insoluble gelatine is necessary on the material to be sensitised. In case of prints treated with aniline and other similar salts, I claim the advantage of simplicity of production and novelty.

Mr. Manly's claims are:—

1. A solution containing one or more of the light-sensitive compounds of chromium in conjunction with one or more of the manganous salts for the preparation of a light-sensitive surface for the production of photographic images.

2. A suitable material, such as paper, rendered sensitive to light by the application of a solution containing one or more of the light-sensitive compounds of chromium, in conjunction with one or more of the manganous salts, for the production of photographic images.

3. The production of photographic images in pigmented or coloured gelatine, by exposing the sensitive material described in Claim 2 under a negative or other screen to obtain a print, fixing such print by washing it in water to remove the unchanged salts, drying the same and bringing it in contact with pigmented gelatine in a solution containing acetic acid and a reducing agent such as hydroquinone, drying again, and developing the image by dissolving in hot water those portions of the pigmented gelatine which have not been rendered insoluble by the action of the oxide constituting the image.

4. The production of photographic images in pigmented or coloured gelatine by exposing the sensitive material described in Claim 2 under a negative or other screen to obtain a print, fixing such print by washing it in water to remove the unchanged salts, drying the same, coating it with a hot solution of pigmented gelatine, allowing the same to dry, dipping the print thus treated in a solution containing acetic acid and a reducing agent, such as hydroquinone, drying again, and developing the image by dissolving in hot water those portions of the pigmented gelatine which have not been rendered insoluble by the action of the oxide constituting the image.

5. The use of a sensitised paper or other material, such as described in Claim 2, giving an image in metallic oxide on exposure to light for the production of coloured images by treatment with aniline and other salts, capable of giving colour on oxidation.

6. The production of photographic images in oxides by the exposure of a surface rendered sensitive to light by the application of a solution containing one or more of the light-sensitive compounds of chromium, in conjunction with a metallic salt capable of being converted into an oxide by the action of light on the sensitive chromium compounds.

#### IMPROVEMENTS IN THE COOKE LENS.

MR. H. DENNIS TAYLOR'S description of his patented improvements in the Cooke lens is as follows:—

It is often of the greatest importance to photographers to have the power of altering at will the focal lengths of their lenses. In the case of rectilinear lenses, each half of the lens may itself be used as a lens of about double the focal length of the complete combination. But there are lenses of other types, especially that known as the "Cooke" lens, in its various series, whose constituent lenses cannot be separately employed for photographic purposes as lenses differing in focal length sufficiently from that of the complete combination, and this invention is for the purpose of supplementing this deficiency in a sufficiently simple and effective manner. In the case of all the Cooke lenses described or comprised in the Patent Specifications No. 22,607 of 1893 and No. 15,107 of 1895, the back lenses of the combinations are elementary or simple, and the essence of this my invention is the device of making these simple back lenses interchangeable with one or more supplementary simple back lenses made of glasses differing in dispersive power, and varying in focal length substantially as their dispersive powers, thereby keeping the state of achromatic correction practically constant, while permitting of very considerable alterations in the focal lengths of the whole combination.

These interchangeable back lenses may be either mounted each into a separate cell to screw into the back of the lens mount, in place of the normal back lens, or may be mounted in a sort of wheel, sector, or swivel, all equally distant from the centre of such wheel, &c., each lens in turn being brought into correct position behind the permanent parts of the Cooke lens, by means of rack or lever and a light spring detent. Or they may be mounted two or three together in a straight slide working to and fro. Various other methods of mounting or interchanging these lenses may be devised.

The changed equivalent focal length may be expressed by the following formula, where—

$F$  = the equivalent focal length of the whole combination with its normal back lens.

$u$  = the distance from the back lens of a point on the optic axis to which or from which the axial rays are converging or diverging before

entering the back lens;  $u$  is positive if the rays are divergent, and negative if they are convergent.

$b$  is the focal length of the normal back lens.

$c$  is the focal length of the supplementary back lens.

$x$  is the required focal length as modified by the use of the supplementary lens (whose focal length is  $c$ ).

Then—

$$X = F \frac{u - b}{u - c} \cdot \frac{c}{b}$$

If the rays entering back lens are parallel, and therefore  $u = \infty$ , then  $X$  is simply  $F \frac{c}{b}$ . The rays are diverging before entering the back

lens of the Cooke lens, series 111<sup>a</sup> (described in Patent Specification No. 22,607<sup>93</sup>, pages 10 and 11), and the back lens thereof is made of a borosilicate crown, having the very low dispersive power of  $\frac{1}{50.5}$  for rays

D to G. This back lens may be changed for one of extra dense flint glass, which may be of double the focal length of the normal back lens, since its dispersive power is double that of the borosilicate crown, or  $\frac{1}{25}$  for the same rays D to G. In this case, doubling the focal length

of the back lens more than doubles the focal length of the whole combination, as may be seen below. I will now give a list of schedule indicating the curves of several interchangeable back lenses for use in conjunction with various Cooke lenses. All the radii of curvature are expressed in terms of the equivalent focal length of the normal combination or Cooke lens to which they are applied. Therefore, to obtain the actual radii of curvature of such interchangeable lenses, the figures given for radii must be multiplied by the equivalent focal length of the normal combination for which they are intended. All refractive indices are for the D ray, and all dispersive powers for the rays D to G.

#### COOKE LENS, SERIES 111<sup>a</sup>.

This lens is described in Patent Specification, No. 22,607 of 1893, pp. 10 and 11, and fig. 8 of drawings. Radii of normal back lens = +1.265 and 5843. The glass is borosilicate crown, having a refractive index of 1.5101 and a dispersive power =  $\frac{1}{50.5}$ .

1. One interchangeable lens may be made of a light flint glass, having a refractive index = 1.5482 and dispersive power =  $\frac{1}{35.2}$ ; curves + 1.23 and + 1.23 (equi-convex). This lens, in place of the normal back lens, will increase the normal focal length by about 1.6 times.

2. Another interchangeable lens may be made of extra-dense flint glass, having a refractive index of 1.6527 and a dispersive power of  $\frac{1}{2}$ ; curves + 1.77 and + 2.47. This lens, replacing normal back lens, will increase the normal focal length by about 2.6 times.

#### COOKE LENS, SERIES 111<sup>b</sup>.

This lens is described in Patent Specification No. 15,107 of 1895, p. 12 and fig. 8 of drawings. Radii of normal back lens = +3.623 and +770, and the glass is dense barium crown. Refractive index = 1.6114; dispersive power =  $\frac{1}{44}$ .

An interchangeable back lens may be made of extra dense flint of refractive index = 1.6527 and dispersive power =  $\frac{1}{25}$  curves + 2.35 and + 2.35 (equi-convex).

This lens, replacing the normal back lens, will increase normal focal length by about 1.6 times.

#### COOKE LENS, SERIES V.

This lens is described in Patent Specification 15,107 of 1895 on p. 14 and fig. 10 of drawings.

Radii of normal back lens = +10.12 and +.6975, the glass being dense barium crown having refractive index = 1.6114 dispersive power =  $\frac{1}{44}$ .

An interchangeable back lens may be made of extra dense flint glass having refractive index = 1.6527 and dispersive power =  $\frac{1}{25}$  curves + 8.06 and + 2.04.

This lens, replacing the normal back lens, will increase the normal focal length by about 1.5 times.

The above are the interchangeable lenses likely to be the most useful. Of course, other interchangeable lenses may be worked out which will give more moderate changes of focal lengths should they be desired. It would scarcely answer, however, to resort to a flint glass at all denser than that above specified of which to make an interchangeable lens for a still greater elongation of focal length.

The claim is for the application to photographic lenses of the character herein described, possessing simple back lenses, of interchangeable simple back lenses, made of various glasses and varying in their focal



lengths approximately as their dispersive powers for the spectrum interval, D to G, whereby considerable variations in the equivalent focal lengths of the whole combinations may be obtained, such interchangeable lenses being either mounted in separate cells for screwing or otherwise fitting into or on to the back of the compound-lens mount, or else mounted on a slide, wheel, sector, or other mechanism whereby they may be quickly interchanged.

#### PALLADIUM TONING.

Before the Richmond Camera Club, on March 13, Mr. G. Ardaseer read a paper on palladium toning. After prefacing his remarks with a short account of the metal and the mode in which it was obtained, he said that there did not seem to be any reason why palladium and iridium, in common with the nearly related metal, platinum, should not be used for toning silver prints. He had experimented with iridium, but without success. As regards palladium, however, he had been able to produce results which were decidedly encouraging, and he passed round some small prints on matt-surface paper, the tones of which he thought would be considered pleasing. They varied from a warm brown to a sepia, but as to their permanency, he could as yet give no opinion. He thought, however, that time spent in such experiments as this was not wasted. The knowledge gained from some small experiment had frequently led to important results; for example, the present platinotype process owed its origin to a test-tube experiment.

Mr. Ardaseer said that the salt of palladium to be used in toning was the chloride, and that the best form in which to obtain it was in solution. An ounce bottle containing ten grains of chloride could be obtained from Messrs. Hopkin & Williams, Cross-street, Hatton Garden, for three shillings, and, although at first sight it seemed somewhat expensive, it was not really so, as a little went a long way.

The first formula he would recommend was as follows:—

Palladium chloride solution .....	30 min.
Citric acid .....	20 gr.
Sodium chloride (common salt) .....	30 "
Water .....	10 ounces.

The prints should first be put into a bath of salt and water; so as to convert the free nitrate of silver into chloride of silver, and, after well washing, into the toning bath, where they should be left till they were a warm purple on the surface. They should then be put in a bath of washing soda (half ounce to twenty ounces of water) to neutralise the acid and prevent sulphur toning, and then into the hypo bath, which should be half strength (1 in 10). The prints changed considerably in appearance in the fixing bath, but, when washed and dried, they assume the warm brown or sepia colour referred to above.

There was another toning bath without salt, viz.:—

Palladium chloride solution .....	15 min.
Citric acid.....	10 gr.
Water .....	10 ounces.

This gives warmer tones, but the prints undergo considerable reduction in it.

Mr. Ardaseer then toned some prints he had brought with him, leaving some in the toning bath longer than others, and he promised to bring them to the next meeting, so that the members might see the results when dry.

#### ON HYDROGEN PEROXIDE AS THE ACTIVE AGENT IN PRODUCING PICTURES ON A PHOTOGRAPHIC PLATE IN THE DARK.\*

In former papers it has been shown that the active bodies, both metallic and organic, are able to act on a photographic plate even when thin layers of many different substances are interposed; for instance, if a thin sheet of gelatine be laid on a polished zinc plate, it only very slightly modifies either the sharpness of the picture or the time required for its production. If the gelatine plate be thicker, the action will still pass through, but the picture will be more indistinct and the time necessary for its production longer. If a two per cent. solution of hydrogen peroxide be poured into one of the small glass dishes, and a sheet of gelatine 0.0015 inch thick be placed over it  $\frac{1}{2}$  inch above the liquid, a picture will be obtained in fifteen minutes. If the sheet of gelatine be 0.008 inch thick, then the exposure must be for one hour; and, if the gelatine be 0.01 inch thick, an exposure of three hours is necessary. If a sheet of celluloid be substituted for the gelatine, and it be 0.005 inch thick, the action still passes through, but more slowly than through the gelatine, and the plate now requires one hour exposure to give a good picture. With a plate of celluloid of double the above thickness, the exposure must be four times as long; and, if the thickness be 0.033 inch, the time of exposure has to be thirty hours. These determinations show well what happens in these cases, but are only good approximations, not standard results. In addition to gelatine and celluloid, gutta serena tissue, india-rubber tracing paper, collodion, albumen, goldbeaters' skin, parchment, &c., also allow the action to take place through them, and the obvious question which presents itself is, If hydrogen peroxide be the body

which gives rise to the action, how does it pass through these different bodies? Take the definite case of zinc, if a plate of this metal be rubbed with coarse sand paper and placed in contact with a photographic plate, a clear and sharp picture of the scratches is obtained, and it might have been expected that, when the action took place through even a very thin sheet of gelatine, the picture of the scratches would have no longer been visible, or at least only indistinctly so, but experiment shows this is not the case. How, then, does the peroxide permeate the gelatine? Not by the ordinary process of diffusion, for hydrogen cannot diffuse through it, so that it must be by a process of dissolving, or very feebly combining with the medium or with a constituent of it, and thus travelling through escape on the other side. That the action is of this nature seems rendered probable by the following experiments, which show, at least to some extent, what takes place:—

A two per cent. solution of hydrogen peroxide was placed in a dish with a sheet of the thinnest gelatine about one hundredth of an inch thick; above it and on the gelatine a photographic plate was placed, and allowed to remain there for twenty minutes. No picture was formed. Immediately on removing this first plate from gelatine a second one was put in its place, and allowed to remain there also for twenty minutes. This plate gave a faint picture, the third one gave a darker picture, and the fourth one was still darker; but the fifth, sixth, and seventh plates were, as far as could be judged by the eye, of the same degree of darkness. Thus the amount of peroxide given off on the upper surface of gelatine went on increasing for one hour and twenty minutes, and then the action became uniform. The same kind of action occurs if zinc be used in place of peroxide solution. If a thin sheet of gelatine be laid on a piece of zinc and allowed to remain there for a week, then, on placing above it a sensitive plate, a picture will be produced in about one-third to one-fourth the time which would have been necessary if the previous exposure to the zinc had not taken place. Celluloid was found to act exactly in the same way as the gelatine. The plate, after the first half-hour's exposure, gave no pictures, but a faint one after the second half-hour; and it was not till after the fourth half-hour that the action became constant. A thicker specimen, 0.011 inch thick, was also examined after intervals of two hours; it acted in the same way as the other specimens, but required ten and a half hours before the action became uniform. If drying oil or copal varnish be used in place of the peroxide of hydrogen solution, analogous results are obtained. This action explains how pictures can be obtained from invisible originals. If, for instance, a piece of white cardboard or paper is placed behind a copper stencil and is exposed to the vapour from peroxide of hydrogen solution, drying oil or copal varnish, &c., the exposed part of the paper becomes active, although not visibly affected, and, on placing it on a sensitive plate, a picture of these parts is produced. Zinc acts in the same way, but only slowly. A zinc ornament, laid on a piece of Bristol board for eight months, charged the board only so far as to enable it to give a faint picture.

Gelatine can be substituted for the paper in these experiments, and can be charged and made to convey a clear picture to a sensitive plate. It is, then, evident that the action arising from zinc and other active bodies can, by an intermediate and inactive substance, be carried away and allowed to expend itself at another time and at another place.

With regard to the transmission of the action through gelatine, the water which it contains is probably the body which enables the peroxide to pass through. It can also be shown that it aids the transmission of the action through other inactive bodies; for instance, if Bristol board in its ordinary condition be placed on a polished piece of zinc, the action of the zinc only slowly passes through it, but if the board be damp the transmission takes place much more rapidly. The following comparative experiments illustrate this: Two similar pieces of Bristol board were taken; one was dried and then placed between a piece of perforated zinc and a sensitive plate and put under a bell jar with calcium chloride; the other piece of Bristol board was suspended over water until it was thoroughly damp and then placed between perforated zinc and a sensitive plate under a bell jar with a little water present. Both experiments were continued for twelve days, when it was found that with the dry board there was no picture produced, but with the damp one there was a good and dark one. If copal varnish be used in place of zinc, similar results are obtained, and, if parchment be substituted for Bristol board, the results are the same.

These experiments are, however, not conclusive, for it has been shown that with additional amount of water some of it finds its way to the zinc, and there induces the formation of more peroxide, which may account for the darker pictures. Even with the terpenes the additional amount of water may induce the additional formation of peroxide. This objection can, however, be obviated by cutting off the moisture in the damp medium from the active substance, or by using the aqueous solution of the peroxide as the origin of the action. In order to stop the aqueous vapour from either passing from the damp Bristol board or to it from the peroxide solution, a piece of tracing paper is interposed which allows the action to pass through it, but not any appreciable amount of aqueous vapour. On placing a sheet of tracing paper over a glass dish containing the peroxide solution and above it dry Bristol board with a photographic plate, in one and a half hours just an indication of a picture was produced, but when under the same conditions Bristol board, which had



been over water for nineteen hours was used, then a dark picture was formed. Again, similar experiments were made using a not highly glazed paper in place of the Bristol board, and the results were the same.

In place of tracing paper, celluloid was used and the dry Bristol board gave, under similar conditions, no picture, but the damp one a very distinct picture. In order to avoid having so much water present, plaster of Paris set by a little of the peroxide solution was used in place of the aqueous solution, and exactly similar results were obtained, so there is no doubt that hydrogen peroxide can readily pass through a porous body by the aid of water.

Alcohol acts in the same way as water, for, when plaster of Paris wetted with peroxide solution was poured into a couple of similar dishes and allowed to set, and over one a piece of dry, and over the other a piece of Bristol board moistened with alcohol were placed, and sensitive plates above them, after fifty minutes only a very faint picture was formed above the dry board, but a dark one over the wetted board.

Celluloid is, however, nearly as transparent to these actions as gelatine, and water in this case cannot be the transmitting medium, so that the question is whether there be any constituent of the celluloid which may act in a similar way to that of water in the gelatine. From the following experiments it seems that camphor can do so:—

Camphor itself, like water, is a perfectly non-active body. To obtain a thin non-porous layer of this body is difficult, but it is easy to prove that the emanations from hydrogen peroxide solutions, from zinc, copal, or other active bodies, are readily absorbed by it and readily pass through it. For instance, if a piece of camphor be placed about a quarter of an inch above a two per cent. solution of hydrogen peroxide for seventeen hours, and be then removed and placed on a sensitive plate for fifteen minutes, it gives a dark picture, and when a similar experiment is made, using drying oil in place of the peroxide solution, and the camphor be exposed to its action for three days and then brought in contact with the sensitive plate for one day, a dark picture is produced. This action can, however, be easily carried still further and proved to pass through even a thick layer of camphor. A piece 0.137 inch thick was placed about one-eighth of an inch above a two per cent. solution of peroxide in a dish for sixty-six hours, and a sensitive plate placed on the top of it; on treating this photographic plate with the developing solution, it was found that a considerable amount of action had occurred. Thus the camphor, which is a principal constituent of celluloid, may enable hydrogen peroxide to pass through it.

That gutta percha and pure indiarubber should allow the action to pass through them is remarkable. The substance known as gutta-percha tissue has a thickness of about 0.003 inch, and allows the action to pass readily through it; in fact, if even two thicknesses of this tissue be placed over the two per cent. solution of the peroxide for seventeen hours, a dark picture is obtained. If the tissue be laid on a polished piece of perforated zinc, and a sensitive plate above it, after remaining there for a fortnight a fairly good picture is obtained. If drying oil be used, the action will pass through the gutta percha in three days. With regard to this transmission of the action, although the chemical constitution of gutta percha is not well established, it is said to be a body related to camphor (Bernthsen, *Organic Chemistry*, p. 509), and hence the action passes through it as it does through celluloid, and this is borne out by the fact that, if a piece of gutta percha be placed for eighteen hours over the two per cent. peroxide solution, and then placed for twenty minutes on a sensitive plate, it evidently has become active, for it then gives a good picture.

The above remarks apply also to indiarubber. The thinnest sheet that has been experimented with is 0.017 inch thick; this allowed the action to pass through it, but was too thick to give a picture; but, like the gutta percha, if placed over the peroxide solution, it became active, and produced considerable action on a photographic plate.

With regard to other substances which allow the action to take place through them, the most interesting are true goldbeaters' skin and albumen. If Bristol board or paper be carefully painted on one side with white of egg and allowed to dry in the air, it forms a medium through which the peroxide can pass. Collodion also allows the action readily to pass through it. In all these cases the tetra paper may be used to confirm the results obtained.

Then with regard to bodies which do not allow the action to pass through them. Paraffin is one of them. If paper be painted with melted paraffin, and it be placed over a solution of the peroxide, no action passes through, neither is it able to absorb the peroxide like camphor, and indiarubber, and gutta percha. A piece of paraffin placed over the peroxide solution for twenty hours, and then tested by placing it on a sensitive plate, produced no action.

Gum arabic is a body which sometimes is very opaque; but this is simply a question of hydration, and is confirmatory of what has been said before with regard to the action of water. Some unglazed paper was painted on one side with two coats of good gum arabic, and some of it was dried at 55° for some days, and another portion of it was air-dried only for some hours, and both were put over drying oil for three days. The dried paper gave only a very faint picture, but the more moist one a very dark picture.

When experimenting, some time ago, on the general nature of these reactions, polished zinc was placed below some inactive liquids to test

whether any action took place through them. The small glass dishes were used, and a disc of bright zinc laid inside, and the liquid to be tested poured upon it; then the photographic plate was placed on the top of the dish. After remaining there for three or four days, the plate was generally found acted on as if the zinc had been able to exert its influence upon it. Lately these experiments have been repeated and extended, and, as indicating the extreme delicacy of the reaction with the photographic plates, are of interest. The form of experiment was the same as described above, and the liquids used were alcohol, ether, ethyl-acetate, chloroform, benzene, petroleum spirit. All these liquids were purified, so that, when placed in the dish with the sensitive plate above them, no action, after a week's exposure, took place. However, when a zinc disc was introduced below the inactive liquids, the photographic plate was generally acted on; but with the benzene and petroleum spirit sometimes no action occurred. These rather singular results were next tested in another way. Portions of these inactive liquids were put into stoppered bottles with polished strips of zinc foil, and allowed to remain there for a week, and it was then found that the liquid had become active, for on testing it, by putting it into a dish with a photographic plate above it, a dark picture was formed, so that the action of the zinc was to make the whole of the liquid active. Magnesium, cadmium, aluminium, fusible metal, and bismuth all produced effects similar to those obtained with the zinc, but nickel, lead, tin, &c., produced no such effects. Further, it was proved that a very small amount of peroxide rendered alcohol, for instance, very active; 0.1 c. c. of a two per cent. solution of the peroxide added to 10 c. c. of alcohol gave it the power of acting on a sensitive plate  $\frac{1}{2}$  inch above the surface, so as to produce, in a few hours, a dark picture. The still more careful purification of these liquids, and especially the exclusion of moisture, was undertaken, and in every case it was found, when all moisture was excluded, that the zinc had no longer the power, when below a liquid, of acting on a photographic plate. Specimens of alcohol, ether, and chloroform were prepared, and these, when placed in a dish with zinc at the bottom of it (standing over sulphuric acid), allowed no action to pass through them, and when treated for a week or more with bright zinc in a bottle, still retained their perfect inactivity. To a sample of the alcohol which, in a dish with zinc, allowed no action on the sensitive plate above to occur, a trace of water was added—as much as adhered to the end of a thin glass rod—and now, with the same length of exposure, a dark picture was formed. From these experiments, as well as those previously mentioned, it appears that this action on the photographic plate is one of extreme delicacy.

The action of water alone on zinc is interesting, and appears to confirm the view that hydrogen peroxide is the active agent in all these reactions. It has already been shown that, although bright zinc is active, dull zinc is inactive. However, if a piece of bright zinc be placed in water, and remains there for twenty-four hours or so, it, of course, oxidises, white spots or lines appear, and, in fact, in time the whole surface would become covered with oxide. Now, the oxide thus formed is strongly active. Take the plate out of the water, let it dry, place it in contact with a photographic plate, and a strong picture of the spots of oxide is obtained. No doubt peroxide of hydrogen is formed, and remains entangled in this porous oxide; in fact, it is difficult entirely to remove it. The plate, with this oxide on it, may be dried at ordinary temperatures and exposed to the air for a day or two, and the oxide is still active, or it may be dried over calcium chloride or even exposed to a vacuum for some time, and is still active, but, if heated to 55° for seventeen hours, then its activity is gone, and a picture the reverse of the former one is obtained; that is, the oxide is now quite inactive, but the metal itself is very slightly active. Oxides of zinc, cadmium, and magnesium, if wetted with peroxide of hydrogen solution, act in the same way, and retain their activity with great pertinacity.

From the foregoing experiments it is then concluded that hydrogen peroxide is the agent which directly or indirectly causes the changes in the photographic plate.

This investigation has been carried on in the Davy-Faraday laboratory, and I would again tender my best thanks to the managers of the Royal Institution for allowing me to work there. My thanks are also due to Mr. O. F. Blook, who has most efficiently helped in carrying on the above experiments.

W. J. RUSSELL, Ph.D., V.P.R.S.

#### SOME ANALOGIES OF LIGHT.

BEFORE the Leeds Camera Club, on Wednesday evening, March 22, Mr. E. Heywood lectured on "Some Analogies of Light," illustrated by lantern views. Mr. Heywood drew the attention of the members to the absolute necessity of every photographer knowing something of this power, and the more they studied it the more fascinating did that study become. Light was rapid, vibrating movement, travelling at the rate of 186,000 miles per second, and that during this passage the two great powers of heat and light are detached in their transit, the light travelling at a greater speed than the heat rays. The theories advanced by Sir Isaac Newton and other eminent scientists were dealt with by the lecturer, and he showed that they had formed the groundwork of our existing knowledge. A clearer conception might be obtained by a study of the analogy between the movement of light and that of sound. A tuning fork, on being sounded, has its prongs alternately within their



natural limits and beyond them, so setting up a wave or undulatory motion in the air, which waves, impinging on the ear, convey to the brain the sense of sound, and, in a similar manner, the undulatory waves of light, falling upon the eye, are by the rods and cones of the retina conveyed to the brain, and we receive the sensation of light. The lecturer dealt with the question of colours, showing that these sensations were produced by the amplitude of the vibrations or wave lengths per inch, that the colours of the different parts of the spectrum gave different vibrations, and it was owing to these differences that the eye became perceptible of certain colours within a given range. Although it was known that rays did exist above and below those of the visual spectrum, yet, the eye not being adapted to receive them, no sensation of light was produced. The iris diaphragm, as used by photographers in their lenses, was a copy of the natural diaphragm in the human eye, which opened or closed to accommodate the eye to the amount of light it should receive; and just as an excess of light falling upon the sensitive plate kills, so to speak, the image, so would excess of light kill or tire the nerves of the eye, nullifying the action of the rods and cones of the retina, which are the receivers of light by the eye. Many and varied are the actions of light, and the experiments of Dr. W. J. Russell were fully dealt with, and illustrated by a series of slides which that gentleman had very kindly lent to the lecturer, these experiments showing that many substances, such as printers' ink, zinc, wood of certain kinds, &c., would affect the sensitive plate placed for a day or two in contact with them in the dark room, though no sensation of light was conveyed to the human eye. The theories advanced to account for these phenomena being dealt with, photographers, said the lecturer, must therefore see at once the importance of what they did with their plates between the time of exposure and development. The analogy as between the eye and the camera was explained. A slide was thrown on the screen showing the relative value of vibrations of light in relation to their effect upon the sensitive plate, and it was by making use of these factors we are enabled to use a red light in the dark room. Many other interesting facts were explained.

#### THE "MASSEY" FIELD AND STUDIO STAND.

Messrs. MARION, of Soho-square, are introducing this handsome and effective stand, which is exceedingly well made and finished in the best polished mahogany, the legs being of polished ash, with solid brass fittings. Its total weight is twenty-two pounds. It can be folded up like



Fully extended, height 6 feet 3 inches.

an ordinary tripod, or easily taken to pieces. It is both a studio stand and a field tripod, is quite rigid in any position and cannot slip, and is useful for a variety of work, viz., at home portrait work (especially when

at its lowest for children, dogs, &c.); groups outdoors, especially crowded scenes; cinematograph work; lantern work; while, in addition, it may be used as an ordinary tripod stand for all work, either in the studio or out of doors. The detachment of the centre box on pillar leaves an ordinary tripod stand which will carry any size camera. It is quickly adjusted to any height, and the camera can be tilted either way. It is



At its lowest, height 2 feet 9 inches.

provided with a slotted arc in the top board, so that the direction of the camera can be altered without moving the tripod.

It is obvious that the uses to which a strong, rigid, and well-made stand of this character can be put are so many and important, that a professional photographer would find it a very remunerative investment. The Massey stand is one of the best and most efficient pieces of photographic apparatus that we have recently seen.

#### INTERNATIONAL PHOTOGRAPHIC EXHIBITION AT BIRMINGHAM.

The following are the Judges' awards at the above Exhibition:—

CHAMPION AWARDS.—Gold medal, No. 274, Mr. Robert Ayton, Edinburgh; silver gilt medal, No. 916, Mr. John M. Whitehead, Alva, N.B.; silver medal, No. 854, Mr. Charles M. Wane, Edinburgh.

A.—Landscape.—Silver gilt medal, No. 24, Viscount Maitland, London; silver gilt medal, No. 68, Mr. Robert Ayton, Edinburgh; bronze medal, No. 130, Mr. William A. Fraser, U.S.A.

B.—Seascape.—Silver medal, No. 181, Mr. Charles F. Inston, Liverpool; bronze medal, No. 191, Mr. Ernest G. Boon, Italy.

C.—Portraiture, Figures, &c.—Silver gilt medal, No. 239, Mr. W. Weimer, Austria; bronze medal, No. 220, Mr. Pirie Macdonald, U.S.A.

D.—Architecture.—Silver medal, No. 399, Mr. Charles S. Baynton, Birmingham; bronze medal, No. 409, Mr. Walter W. Hollingsworth, Birmingham.

E.—Ladies' Work.—Silver medal, No. 476, Eleanor M. Grey, Edinburgh; bronze medal, No. 457, Alice Baird, Hova.

F.—Beginners.—Silver medal, No. 534, Mr. E. R. Collins, London; bronze medal, No. 523, Mr. Hugh Lewis, Birmingham.

G.—Special.—Silver medal, No. 650, Mr. Ralph R. Rawkins, London; bronze medal, No. 633, Mr. Alfred Holmes, Bradford.

H.—Hand-camera Work.—Silver gilt medal, No. 794-797, Mr. J. Kearney, jun., Liverpool; bronze medal, No. 803-806, Mr. Ernest G. Boon, Italy.

J.—Instantaneous.—Silver medal, No. 851, Mr. W. J. Croall, Edinburgh; bronze medal, No. 838, Mr. C. E. Walmsley, Ambleside.

K.—Flowers, Fruit, and Still Life.—Silver medal, No. 905, Mr. Henry Troth, U.S.A.; bronze medal, No. 898, Mr. William J. Cassard, U.S.A.; extra bronze medal, No. 936, Mr. Walter W. Hollingsworth, Birmingham.

#### SPECIAL PRIZES.

Hand camera, for largest exhibit, Mr. J. C. Warburg, London.  
Hand camera, for best enlargement, No. 24, Viscount Maitland.  
Adams & Co.'s prizes, 5l. 5s., No. 776, Mr. Charles Speight, Kettering; 5l. 5s., No. 700, Mr. H. W. R. Child, London.  
Griffin & Sons' "Velox" prizes.—2l. 12s. 6d., No. 405, Mr. Freeman Dovaston, Oswestry; 1l. 11s. 6d., No. 268, Mr. Amilius Clarke, Bethesda; 1l. 1s., No. 647, Mr. Harold Hill, Sheffield.



## THE PRESERVATION OF NEGATIVES.

THERE is very little doubt that, in the present age of cheapness, photographers have become, as a rule, very negligent in the matter of the preservation of their negatives. Photography has become so popular with the multitude that they are constantly sitting for their pictures, and consequently all but the latest sitting become out of date. Hence photographers deem their stock of negatives of so little value that, in the majority of cases, they are not even varnished. In the old wet-collodion days, it was an absolute necessity to varnish, as the film was too tender to manipulate without a protective coat. Gelatine is not so easily scratchable, and can be retouched upon without varnishing, it is true; but it should be borne in mind that the film of gelatine, if left unprotected, is more liable to attract damp, and to spoil in consequence. P.O.P., either gelatine or collodion, is not so likely to cause silver stains on the negative as albumenised paper; but still occasions do arise when such a stain occurs, and only those printers who have had the misfortune to let an unvarnished gelatine plate get wet while printing can realise the difficulty that arises, in the first place, to get the gelatine paper off the gelatine negative, and afterwards to get rid of the stain which is left. Then, again, supposing negatives to be stored away unvarnished in a damp place, how easily they may become spoiled, and if a sitter should die, or become celebrated, or any of the hundred-and-one eventualities occur, that may at any time, so as to render the negative of that sitter a valuable property, that special negative is sure to be the spoiled one. Negative varnish is not an expensive commodity, and is not used in any large quantity; still, if photographers, who are working cheaply, must cut their expenses as well as their prices and look upon the purchase of varnish as an unnecessary expenditure, they can make it for themselves at a minimum of cost. I do not refer to retouching varnishes which are made from secret formulae, and which should always be used for high-class work, but to a mere protective varnish, to render the film unscratchable and to protect it from atmospheric influences.

If cheapness is a desideratum, twopennyworth of white hard varnish, obtained from the nearest oilshop and diluted with a pint of methylated spirit, will give a pint of negative varnish for sixpence; this is a protective varnish from damp, silver stains, and scratches, but the negative will not bear printing from in hot sunshine, as it will become sticky. A very good varnish similar to the generality of those on the market may be made as follows:—

Gum sandarac .....	1 ounce.
Seed lac .....	1½ ounces.
Alcohol .....	18 "

But for hardness and power to withstand damp as well as heat I can heartily recommend the following formula, which I do not think has ever been published before:—

Gum sandarac .....	2 ounces.
Gum benzoin .....	2 "
Seed lac .....	1 ounce.
Methylated spirit .....	40 ounces.
Ether .....	1 ounce.

When thoroughly dissolved, add one ounce of oil of lavender and shake up well, allow to stand for a day, and filter off for use.

Whether varnished or otherwise, all negatives should be packed away, in plate boxes, after being numbered and registered, in as dry a place as possible, and, if unvarnished, care should be taken that they be not packed where mice can get at them. It is not generally known that mice have a very great liking for gelatine, but it is, nevertheless, a fact, as I have proved to my cost. I once developed a batch of about a hundred view negatives taken in Paris, and, not having sufficient drying rack accommodation, I set them up for the night around the studio; in the morning every plate was covered with feet marks of mice, all nibbled round the edges, and in one or two instances nearly the whole of the gelatine image eaten off the glass.

Where very valuable negatives are concerned, they should never be packed away until a good transparency has been taken, so that, in the event of any accident occurring to the original negative, a duplicate may be made at any time. Negatives which have been intensified with mercury are at the best unstable; but, before storing away, or, in point of fact, immediately after treatment with mercuric bichloride, they should be soaked in a solution of sulphite of soda for at least thirty minutes, as a mere blackening of the image is not sufficient to secure permanency.

C. BRANGWIN BARNES.

## THE CAMERA IN THE BATTLEFIELD.

UNDER the management of the Kingston and District Photographic Society, Mr. René Bull, the war artist and correspondent of *Black and White*, was engaged to give his display of upwards of 250 photographs of the recent Soudan campaign, the battles of Atbara and Omdurman and the taking of Khartoum, and on the 7th ult. he faced a large assembly in St. James's Hall. Mr. Bull has been busily engaged in displaying these views in various places, and always with the most gratifying success.

Photography is quite a new feature in the work of depicting battle scenes, and will probably supersede the war artist's pen and pencil in

uture because of the more faithful realistic pictures it conveys. Mr. Bull had a hand camera with him in his expeditions with the army, and used it with such skill and effect as to obtain results far beyond anything which an artist with simply pen and pencil could achieve. Battles by photography would have appeared a preposterous idea a few years ago; even now it seems incredible; but these are the days of marvels, and it is not improbable that combats in the near future will be depicted with the cinematograph in conjunction with the phonograph or some similar instrument, thus enabling all the sights and sounds of war to be witnessed and heard at entertainments at home. Still, however commendable battle photographs may be, the greatest admiration is due to the artist responsible for them. To manipulate a hand camera in the face of the enemy with the necessary care and skill shows that the operator is a man of great nerve, and such Mr. René Bull undoubtedly is. Several of his snap-shots were taken whilst with the fighting force when within 400 yards of the enemy on the plain. Within such distance of the foe a man's hand is inclined to become unsteady and unfitted for the delicate art of photography; but Mr. René Bull apparently had no such tremors. Not a single glimpse was afforded of the enemy in the act of fighting, so that the views were entirely of hostilities as witnessed on the English side, which might have been disappointing to some of the audience. If the proprietors of the journal represented by Mr. René Bull had acted in accordance with its title and had had a black snap-shotter with the Dervishes, the deficiency might have been met, but that was perhaps impossible. But, if any disappointment was experienced, it was fully compensated for by the general excellence of the views, some of which were indeed magnificent. In addition to exhibiting fine pictures, Mr. René Bull showed fine descriptive powers, particularly in regard to battles, which were recounted with great vividness.

The first series were of operations on the Indian frontier, and were the prettiest because of the lovely scenery through which the British troops passed. The principal views were those showing the Gordon Highlanders besieging the heights of Dargai; the others were mostly of minor incidents of the campaign, such as burning native villages on the hill-sides, field batteries in action, and the Bengal Lancers and their horses descending precipitous rocks. The horrors of war did not escape attention, the audience being shown pictures of the wounded and dying, and, most melancholy of all, the burial of the dead. From the Indian frontier the lecturer turned to the Soudan, and a number of views were shown of the construction of Kitchener's railway across the desert. Next came several splendid views of a sandstorm, which Mr. René Bull said he kept photographing until it was close upon him, when he thought it time to put his camera on the ground and sit on it so that he might afterwards know where the instrument was. Life in camp furnished a number of amusing scenes, and then came the battle of Atbara, which the lecturer led the audience up to step by step from the firing of the first shot until the close of hostilities. He observed that it was perfectly impossible to obtain any sleep the night before the battle, as the slightest sounds in camp placed everybody on the alert. Several views showed the terrible work done by the Krupp and Maxim guns, which shot away portions of the enemy's zareba and stockades, and the trenches behind were soon filled with dead Dervishes, who, as they lay, looked more like bundles of rags than anything else. The guns had been pounding away at the enemy for over an hour when the infantry charged the enemy, and even then they were run forward in lines pouring forth their deadly hail right up to the foe's zareba. A view of the battlefield with the dead and the dying afforded the lecturer an opportunity of controverting the allegation that wounded Dervishes were massacred by the British. The final series of views were in connexion with the battle of Omdurman, which was finely described by Mr. René Bull. One view showed the British line busily engaged in firing upon the enemy, and another depicted the splendid stand made by Macdonald's men against overwhelming odds. A scene depicting the Sirdar directing the battle produced much applause. The arrival of the troops in Omdurman, the Mahdi's tomb, Gordon's palace, and the memorial service at Khartoum were the subjects of the succeeding views, and the lecture fittingly concluded with an excellent photograph of the Sirdar.

## A NEW FORM OF PHOTOGRAPHIC TELESCOPE.

PROFESSOR E. C. PICKERING, of Harvard, has made a strong plea in favour of certain new methods of conducting astronomic work. A great number of very large telescopes of nearly the same form, he says, have been given to observatories during the last few years. Although such instruments are indispensable in a limited number of investigations, yet, when the latter are divided among so many telescopes, the results obtained by each are often disappointing to the donors. These instruments have been erected, says *The Scientific American*, with two or three exceptions, in places selected from local or political motives, and without regard to meteorological or astronomical conditions. For this reason the great observatories of the world are near large cities or universities where the very conditions that have rendered the countries great have rendered them unfit for the most delicate astronomical research. Nine-tenths of these instruments are in the temperate zone in Europe and the United States, while the southern hemisphere has been entirely neglected and



many of the most interesting parts of the southern sky have not yet been examined by a modern telescope of the largest size.

This duplication of expensive instruments in unsuitable localities is rendered still more objectionable by another condition. All the telescopes are similar in form, their focal length being from fifteen to eighteen times the aperture, and therefore all are best adapted to the same kind of work. In view of these numerous precedents, it was a bold step to deviate from it. But this step was taken, and taken by a woman, Miss Catherine W. Bruce, of New York, who gave \$50,000 to the Harvard College Observatory to construct a telescope of 24 inches aperture, in which the focal length should be only six times the aperture. Fortunately, this experiment succeeded, and the Bruce photographic telescope is mounted in Arequipa, Peru, in a climate unsurpassed, so far as is now known, for astronomical work. Its immediate results are charts, each covering a large part of the sky and showing such faint stars that 400,000 appear upon a single plate. By its aid many new stars of the peculiar fifth type have been found in the Large Magellanic Cloud, showing an additional connexion of this object with the Milky Way. A group of forty nebulae, hitherto unknown, has been found in another part of the sky. The most important work of the Bruce telescope, however, is that every year it sends hundreds of photographs to the great storehouse at Cambridge. Besides the immediate discoveries made from these plates, they, doubtless, carry with them many secrets as yet unrevealed, and many images of objects of the greatest interest yet to be discovered. A striking example of this kind is found in the recent discovery of the planet Eros, which, next to the moon, is sometimes our nearest neighbour in the heavens. Calculation showed that this planet must have been near the earth, and therefore bright, in 1894. An examination showed that this object, although not discovered until 1898, had not escaped the Harvard telescopes. Two images of it were found upon the Bruce plates, fifteen upon the Draper plates, and three upon the Bache plates. It can thus be followed through nearly half a revolution. Six images were also obtained in 1896, when it was more distant and much fainter.

These examples show the advantages of trying new forms of telescopes instead of duplicating those now existing. The Bruce telescope is well adapted to investigations in which the focal length is small. It will, therefore, be interesting to try the effect of a great focal length. It is proposed to build a telescope with an aperture of 12 to 14 inches and a focal length of 185 or 162 feet. This telescope would probably be placed horizontally, and the star reflected into it by means of a mirror. The motion of the earth would be counteracted by moving the photographic plate by clockwork. It would thus become a large horizontal photo-heliograph. This method of mounting a telescope for use on the stars was advocated by the writer in 1881, and has been used here since then with successive telescopes of 2, 4, and 12 inches aperture. The instrument here proposed would be adapted to investigations for which a great focal length would be needed, as the latter would be more than a hundred times the aperture. Several such investigations may be suggested, any one of which, if successful, would amply justify the construction of such an instrument.

Professor Pickering says the best instrument now in use for photographing the sun is the horizontal photo-heliograph. It is a small instrument of this form. Under favourable atmospheric conditions, finer details on the sun's surface could be obtained with a large instrument than have yet been photographed. It could also be used in photographing the protuberances, and it should not be forgotten that preparations must be soon made to observe the solar eclipse of May 28, 1900. The new instrument might be useful in photographing the spectrum of the reversing layer and in showing the details of the inner corona. Images of the moon obtained with such a telescope would be more than a foot in diameter, even if printed without enlargement. These would probably surpass the best photographs yet taken. It is possible that good results could be obtained with Jupiter, Saturn, and perhaps Mars. The planet Eros approaches the earth in 1900. This will be a more favourable time for observation than any other until 1927. Careful preparations should, therefore, be made for observing Eros when east and west of the meridian, since the distance of the sun can probably be determined with more accuracy in this way than by any other method of observation yet attempted. This is one of the greatest problems of astronomy, although it was supposed to be solved in the eighteenth century, but it will probably be left until the twentieth century for a practical solution. It is expected that the positions of the adjacent stars could also be determined with this instrument with an accuracy approaching that of the heliometer.

#### KISSING BY CINEMATOGRAPH: AN AMUSING CASE.

At the Newcastle County-court, last week, an action was brought by F. W. Dodsworth, Collingwood-street, Newcastle, against the Rev. B. Stone Spencer, Curate of St. Paul's, Gateshead, to recover 1*l.* 16*s.* in respect of a cinematograph entertainment given at the parish hall of the church.—Mr. D. E. Stanford was for the plaintiffs, and Mr. Hick for the defendant.

Mr. Stanford said the usual charge for the entertainment was 2*l.* 2*s.*, but in this instance they agreed to take 1*l.* 16*s.* On arrival at the hall the plaintiffs' man was asked by Mr. Stack, the vicar, if the pictures to be

exhibited were in order and fit to be shown. The answer was "Yes." The man referred to one picture. This showed a man at one side of the fence tarring it, and a man at the other whitewashing it. They concluded by tarring and whitewashing each other. This, the man said, was "a dirty scene." (Laughter.)

The Judge: One half of it. (Laughter.)

Mr. Stanford: Both.

The Judge: The whitewashing would not be dirty. (Laughter.)

Mr. Stanford added that, towards the close of the exhibition, some pictures were shown which appeared to have created a terrible sensation in Gateshead. (Laughter.) One represented a fisherman sitting under a rock, and three or four properly attired boys who were anxious to bathe. (Laughter.) The boys succeeded in throwing the fisherman in the water. Then there was depicted a scene in a garden, in which there were three seats. Upon the middle one sat a lady. A gentleman came up slyly behind and kissed her. That was the picture objected to as unfit to be shown to the audience.

His Honour: It is an indecent assault. (Laughter.)

Mr. Stanford went on to read a letter from the defendant to the plaintiffs, dated February 16. This epistle said the writer was sorry to have to say that he had to report more than unfavourably of the entertainment. It had been the cause of very serious complaint. There was one picture which disgusted most of the audience. The writer believed that it was the bathing scene, but this he did not recognise at the time—(laughter)—as it was so indistinct. Some mentioned it afterwards, and expressed some surprise that the picture was not stopped. The second part of the programme was not finished. It was stopped because of the picture which was called *Courtship*. The vicar interfered, and told the operator to withdraw it, but the man refused to show any more, and commenced to pack up. The vicar at the outset said, "We are very particular, and not only do we not want anything indecent, but nothing low or vulgar." The man would not give a list of subjects, but said the worst picture was that showing a man tarring on one side of a fence, and another whitewashing on the other side. The picture called *Courtship* had done lot of injury to the parish. He (Mr. Stanford) supposed that the parishioners had been so injured that it would be possible ever to get them redeemed. (Laughter.) This entertainment had been given in many places. At Longhurst the picture was shown, and the Rev. R. Proctor expressed great delight, and said his people were pleased.

Mr. Hick said the case rested entirely upon a question of breach of contract. They objected to one of the pictures, and said it could have been taken out and the entertainment proceeded with.

John Bolton, who was in charge of the apparatus, stated he did not refuse to exhibit. When the kissing picture was stopped, he did not turn to the audience and say that he could see no harm in it. What he did say was that he was extremely sorry that the vicar should have interposed. He was excited when the picture was stopped, but not until then. It was not necessary to swear at the machine, because it was one of the latest. (Laughter.)

Mr. Hick argued that the vicar was perfectly justified in insisting upon having the kissing picture taken out. The vicar objected to kissing.

The Judge: Do you mean that kissing is less known in Gateshead than elsewhere, or that it is so well known that they want to stop it? (Laughter.)

Mr. Hick: I say a picture of the sort at a parish hall is one thing and the same picture at a music-hall another.

The Judge: If you call the picture *Courtship*, it does not seem to me to be indecent. (Laughter.) If the girl were a stranger to the man, then it would be very indecent. (Laughter.)

Mr. Hick: But that cannot be ascertained from the picture. (Laughter.)

The Judge: If it is intended for courtship, where is the indecency?

Mr. Hick: It is not exactly a question whether it is indecent or not, but whether the vicar liked to have such a picture shown.

The Judge: I should be astonished to find that the vicar is such an unreasonable man as you are making him out to be. Here is a machine that cannot be started, when stopped, without difficulty, and you ask me to say that he ought to have it stopped as he chose. He ought to have asked for details beforehand.

Mr. Hick: My instructions are that he did ask for them, but did not get them.

Mr. Stanford: That is not the fact.

Mr. Hick submitted that there was no reason why the entertainment should not have been completed. His contention was that the plaintiffs' man, when told to go on with his performance, ought to have done so. Not having done so, he had broken the contract.

The Rev. J. Stack (Vicar of St. Paul's, Askew-road, Gateshead), said he asked the plaintiffs' man to let him have a look at the pictures, and he said he had not got them. Witness told him that he was very particular, and the operator said he would give him the names of the pictures, adding, "Do you think I would bring anything here that you would not approve of?" He said the worst picture was that which had been mentioned of two men tarring and whitewashing. Witness said that, if that were the worst, he was quite satisfied, but added, "Remember, if there is anything improper I will stop it." He not only objected to things wrong in themselves, but to anything at all vulgar, "such as kissing matches." He mentioned it particularly because it was a common thing in such entertainments. The kissing picture was "a most violent windmill perform-



ance" with their arms in a most elaborate and grotesque style, and was utterly low. When he saw this picture being thrown on the screen he went to the plaintiffs' man, and said, "I told you I would not have anything of the kind, and you must stop it." The operator said, "What for?" Witness replied, "Because I wish it," and put his hand in front of the machine, but did not touch it, knowing that it would have been dangerous to do so. The plaintiffs' man then stopped the machine, and witness told him to take out the objectionable picture and to go on with the next. He declined, and turned and made a speech to the audience, saying: "Our worthy vicar objects to the picture. I suppose he does not approve of kissing. I can see no objection to it." (Laughter.) Witness said, "That is no business of yours; I object to the picture. Go on with your performance." Witness added if "he did not go on with the performance, he would not pay for it." He could bring evidence that the men were swearing at the machine. Besides the kissing picture there was another which people said they were surprised he had not stopped. He prohibited the scene because he did not know what it was coming to. "You never do with these pictures." (Laughter.) The courtship picture is a wild kissing match and nothing else. (Laughter.) They don't court that way at Gateshead; they may in Newcastle. (Laughter.)

The Judge: There are things all right in one place and entirely wrong in another. (Laughter.)

Mr. Stanford said the plaintiffs were not guilty of breach of contract, because it was the vicar, and not they, who stopped the entertainment. His Honour had seen the picture which had been submitted to him, and he did not think that he had found anything wrong in it.

The Judge said he thought it was decidedly vulgar. He had no doubt that part of the audience would have enjoyed the picture extremely, but that was no reason why those who were trying to raise them should not have the right to object. He thought the vicar was within his rights in putting his hand in front and stopping the picture. He could not come to any other conclusion than that the contract was not completed. It seemed monstrous to suppose that gentlemen in the position of the vicar should have no power in their hands in such circumstances, but were to leave it to the discretion of others as to what they were going to exhibit. Judgment must be for the defendant.

### THE PHOTOMETRY OF INCANDESCENT LAMPS.

At a recent meeting of the Franklin Institute, Philadelphia, Professor Arthur J. Rowland read a short paper on "The Photometry of Incandescent Lamps," describing a special plan of using a photometer for directly determining their candle power. He illustrated his talk by a portable photometer, made by the Newark Ornamental Sign and Iron Works, of Newark, N.J. This is a Bunsen photometer or one in which a measurement of candle power is effected by moving a paper with a grease spot on it, backward and forward along a line joining two lights to be compared, until the grease spot disappears. The candle power of one light being known, a measurement of distance to the paper from each of the lights gives the necessary data for computing the candle power of the other one.

The features of the photometer shown were a scale reading directly in candle power, an incandescent electric lamp as a known standard, and an oil lamp as a sort of secondary or intermediate standard.

In operating the device, the incandescent standard is set up in position where lamps candle power is to be determined are afterward put, and the flame of the oil lamp adjusted to known candle power at the other end of the photometer bar. The standard is then removed and other lamps of unknown candle power substituted and measured. By using the oil lamp in this fashion, nearly all the common difficult and tedious processes of photometry are avoided, only one volt-meter is required, and only one adjustment of the electro-motive force given the lamp.

Professor Rowland explained how, from his own experience with the instrument, an accuracy of determination of candle power to within  $\frac{1}{2}\%$  of a candle power in 16 is readily attained in a room not especially darkened for the purpose. That is, a single determination will not be more than  $\frac{1}{2}\%$  of a candle power above or below the true value. This is quite good for a commercial photometer.

## Our Editorial Table.

### THE STEREOSCOPIC SWALLOW CAMERA.

Marion & Company, Soho-square, W.

To meet the growing demand for stereoscopic hand cameras, Messrs. Marion are introducing the "Stereoscopic Swallow," a very neat and efficient little instrument, as we have satisfied ourselves from personal inspection. The outside measurements of the camera are only  $5 \times 5 \times 4$ . It has two paired single achromatic lenses, which have two stops easily adjusted. The finder is situated on top of the camera, and folds down when not in

use. The camera is fitted with a time and instantaneous shutter and a carrying strap handle. There are twelve sheaths for holding the plates. The plates are easily and rapidly changed after exposure, and a small disc at the back of the camera shows the number of plates left to expose. The size of plate used is  $4\frac{1}{2} \times 1\frac{1}{2}$ . The lenses are placed at such close centres that no trimming down of the transposed prints is necessary.

### SALMON'S MULTUM DISH-ROCKER.

Salmon & Son, 169, Hampstead-road, N.W.

This dish-rocker may be employed to rock one or several developing or other dishes simultaneously, enabling the operator to give individual attention to each negative. It is so constructed that it requires no fixing, and it may be used on any table or across a sink with pendulum swinging on either side or in front of the operator. The rocking platform,



thirty inches in length, can be made stationary at will, forming a rigid table. The dish-rocker is constructed for portability. The detachable pendulum, hooking on and off, is the corresponding length of the rocking board. The working parts of the apparatus are hardened and tempered steel centres, allowing of any weight dish being rocked with a minimum of friction.

MESSRS. MARION are issuing a new series of mounts called the B.R. ("bas-relief") in silver-grey, havan, and green. These have a deep sunk bevel, and may be had either of circular or rectangular form, and for mounting photographs singly or in threes. The mounts have a most effective appearance for show-case purposes, and should be very popular with photographers.

MARION'S Simpson Print Washer is now made to take smaller sizes than hitherto, namely 24 quarter-plate or 24 half-plates; the dimensions of the latter size being only  $13 \times 11$ . As is well known, the washer is composed of a series of frames latticed with linen tape placed in a siphoned tank, between which the prints are laid and kept from contact with each other. Each frame has a separate spray of water, and thus has a thorough washing.

### CATALOGUES RECEIVED.

Reichenbach, Morey, and Will Company, 323-327, University-avenue, Rochester, N.Y.

THIS Company, in sending us their catalogue, write: "We are sending you under separate cover our price-lists and catalogue. We would call your special attention to the automatic camera. This is a folding camera possessing many new features."

"Our line of manufacture consists of printing-out papers, glacé (gelatine glacé), collodion (matt collodion), and others, to be added as rapidly as time will permit; also photographic shutters and cameras."

"We shall also soon manufacture transparent films under a new system, which is patented in England, France, and Germany. We are desirous of securing a responsible agent in Europe for our goods."

Jonathan Fallowfield, 146, Charing Cross-road, W.C.

MR. FALLOWFIELD has sent us a cloth-bound copy of his 1898-99 catalogue. Ordinarily the volume runs into 850 pages, but, inasmuch as the copy before us is interleaved throughout with plain paper for memoranda purposes, the bulk of the book assumes truly gigantic proportions. Fallowfield's catalogue stands out as the largest and completest production of its kind. It is, moreover, liberally supplied with many fine half-tone Swantype reproductions from excellent negatives taken with the popular "Facile" and "Premier" hand cameras, and a first-rate picture on Edwards's platino-matt bromide paper, &c. As a guide to photographic purchases, the value of Fallowfield's catalogue would be impossible to exaggerate.



## News and Notes.

**PHOTOGRAPHIC CLUB.**—Wednesday evening, April 5, at eight o'clock. Members' Open Night.

The Hon. Secretary of the Kirkcaldy Photographic Society writes: "Many thanks for inserting my letter re lack of enterprise on the part of dealers, &c. Since it appeared I have been inundated with lists, &c."

**CRIPPLEGATE INSTITUTE.**—We are asked to announce the commencement of a course of twelve practical lectures in Photography on April 7, at seven p.m., specially arranged for amateurs. Mr. C. W. Coe, of Wood's, 2, Queen-street, is the instructor. Full particulars can be obtained from Mr. H. W. Capper, Cripplegate Institute, Golden-lane, E.C.

**MESSRS. MCKELLEN, LIMITED,** write: "May we draw your attention, and that of your readers and the trade generally, that McKellen, Limited, have removed their offices and works from 4, Bull's Head-yard, and 7, Stars-court, Greenwood-street, to new and extensive premises—Mill-street, Long Millgate, to which they request that all communications should, in future, be sent."

**THE CAMERA CLUB EXHIBITION.**—At this Exhibition, which we noticed in our issue of the 10th inst., we omitted to state that Messrs. R. & J. Beck, Limited, of 68, Cornhill, were represented by an interesting exhibit, which included the Frena pneumatic release, the Frena pneumatic flap shutter, a new quarter-plate Frena, a very fine portable developing sink all complete, and other novelties, which attracted great attention.

**CRIPPLEGATE PHOTOGRAPHIC SOCIETY.**—The members of this Society are laying themselves out for a big meeting on Monday, April 10, when Mr. A. Horsley Hinton is going to deliver his popular and instructive lecture on "Practical Pictorial Photography," illustrated with lantern slides and pictures. Early application for tickets is requested. Admission free, but a few seats will be reserved at 6d. and 3d. Application should be made to Mr. Alfred T. Ward, Hon. Secretary, Cripplegate Institute, Golden-lane, E.C.

**THE NINTH ANNUAL DINNER** of the Croydon Camera Club was held at the King's Arms Hotel, Croydon, on Wednesday evening, March 22. The President (Mr. Hector Maclean) and about forty members and friends were present. Songs and speeches followed a capital meal. Replying to the toast of the "Croydon Camera Club," Mr. Maclean drew attention to the Club's forthcoming open Exhibition, and invited members to co-operate with the view of making it a success. A feature of the evening was a speech by Mr. Keathley Moore, who is at the head of the movement for rescuing Croydon Hurst from threatened destruction at the builder's hands.

**MESSRS. TAYLOR, BOXALL, & CO.,** Photographic Artists and Enlargers, of the Enlarging Works and Studios, 98, Lewin-road, Streatham, S.W., announce that they have started business for the production of the highest-class enlargements in carbon and bromide, also finishing and painting in monochrome, crayon, water colour, pastel, and miniature. Mr. Horace Kennerley Taylor has been for upwards of seven years as artist with the Autotype Company and other well-known firms, and for the last two and a half years he has been with Messrs. Bender & Co. (late Bender & Langflier, of Croydon), as head artist. Mr. Charles Boxall has been several years with Messrs. Morgan & Kidd; for six years head enlarger to Messrs. Elliott & Son, of Barnet, and lately with Messrs. Bender & Co. in that capacity.

**EDINBURGH PHOTOGRAPHIC SOCIETY.**—A concert of the highest class was given, under the auspices of this Society, on Thursday evening, March 23, in Queen-street Hall, for the purpose of starting a fund to acquire new and more commodious premises. A large audience assembled and were delighted with the performance, which had been arranged by Mr. J. Warrack, junr. Mr. Warrack was, unfortunately, unable to be present, owing to a bereavement in his family. Mr. A. Eddington, the energetic President of the Society, and Mr. J. S. McCulloch (W.S.), Hon. Secretary, kindly discharged the various duties which would have fallen on Mr. Warrack's shoulders during the evening. It is to be hoped that the Society will now see its way to secure accommodation worthy of its importance in the capital of Scotland, and thus avoid the inconvenience caused by overcrowding at its annual exhibitions.

**THE LATE MR. R. TUDOR WILLIAMS.**—We have to record the death of Mr. R. Tudor Williams, photographer, Monnow-street, Monmouth, who died on Friday, the 10th inst., at the age of fifty-nine, after a comparatively short serious illness, but whose demise, owing to a perceptible decline of health for some time past, was not altogether unexpected. Mr. Tudor Williams was a familiar figure in the town, and the memory of him will long remain. In early life he was a somewhat noted athlete, although short of stature, and his exploits at cricket, tennis, and skating are still recalled by many. He established his photographic business early in the sixties, and was well known throughout the country for his excellent artistic work, Lord and Lady Llangatock, among others, having frequently requisitioned his services. Socially Mr. Williams was remarkable for his geniality and kindly disposition.

**MR. W. H. WALMSLEY,** of Philadelphia, writes: "I notice in your printing of my little article, 'An Aluminium Microscope Stand,' in the JOURNAL of March 3, a typographical error, which makes a rather ridiculous error on my part as it stands. After stating that the stand exhibited at the Quekett Club had been antedated, to my personal knowledge, almost a quarter of a century, I am made to say that the late Mr. Joseph Beck had brought one of same material in the spring of 1894—a very obvious error. I may have inadvertently so written, but my intention was to give the date as 1874, the year in which he actually brought the instrument to America. May I ask you to kindly make this correction and oblige? Two other errors are also to be found, but they are not so serious. For 'duty' paid, 'duly' paid should have been given; whilst to 'stick faster than another' is not quite so intelligible as 'stick faster than a brother,' in my manuscript. I am but too well aware of the wretched handwriting I am guilty of, but our compositors and proof-readers seem to get it right, as a rule, when they put in their work upon it."

We have to announce the death from influenza of Mr. C. H. Imrie, the Hon. Assistant Secretary of the Woolwich Photographic Society, on the 19th inst., after a few days' illness. Mr. Imrie was but twenty-six years of age, and was a draughtsman in the Royal Carriage Department, Royal Arsenal, where they have been working under great pressure for the past three months. He was a Whitworth Exhibitioner, and at the beginning of a promising career. His illness was of short duration, for he attended the Exhibition of the South London Society on its closing (Saturday evening, the 11th inst.), and was at his usual duties on the following Monday until about eight p.m., when, feeling unwell, he consulted his doctor and went home to bed. The influenza was quickly followed by pleurisy and pneumonia, which caused his death on the date mentioned above. The Woolwich Society will miss him very much, for his energy and enthusiasm were unbounded.

A CORRESPONDENT writes to *Nature*: "Being driven past a row of trees, I noticed that their intermittent shadow on the closed eyelids gave rise to a vivid chessboard pattern of red and black squares, arranged horizontally and vertically. These were perfectly regular, each being equal to about one-twelfth of an inch at ten inches' distance. Waving the open fingers in front of the closed eyelids exposed to the sun gave the pattern fairly well, but better by flashing the sun's rays across the lids by means of a vibrating hand mirror. I see about seven or eight squares each way, the outer ones not well defined; but a younger man, who was not told what to expect, described them as more numerous. What structure in the eye gives rise to the phenomenon? It is not caused by the eyelids, because a piece of tissue paper can be substituted, the eyes then being open. If the paper is white, the squares are white and black. The pattern occupies the centre of the field of each eye."

**JUDGE WADDY AND THE AMATEUR PHOTOGRAPHER.**—His Honour Judge Waddy, Q.C., had before him, at Sheffield County Court, on Thursday, March 23, an action in which George Tompkin, described as a clerk, of 36, Fieldhead-road, sought to recover 7s. 6d. from Alfred William Jackson, a policeman, of 52, Richards-road, Heeley. Mr. A. Muir Wilson represented defendant. Plaintiff, who said he was an amateur photographer, told his Honour he claimed 7s. 6d. for an enlarged photograph he delivered to defendant, and which the defendant returned without giving any valid reason for doing so. His Honour: Why do you call yourself an amateur photographer if you are doing that for money? Plaintiff: I am not in business. His Honour: If you are making photographs and selling them and being paid for them? Plaintiff: I mean that I don't earn my living by it. His Honour: It seems so absurd to call yourself an amateur. It appeared that plaintiff did three enlargements for defendant, with which he was so pleased that, instead of 10s. for the three, he paid plaintiff 12s. 6d., thinking they were his own and excellent work. They were, as a matter of fact, done by the Sheffield Photo Company. Defendant did not like the fourth enlarged copy of a larger size, and returned it, with severe criticisms, signing himself "Yours disgustingly." His Honour, with the aid of Mr. Dakin, photographer, examined the enlargement, and, in giving judgment, discoursed on the art of finishing enlarged photographs. He said the plaintiff had been parading as a jay in peacock's feathers (laughter), and appeared to know as much about photography as he (the Judge) or Mr. Wilson, for most of them had dabbled in it. Mr. Wilson: I am a duffer at it. His Honour gave judgment for plaintiff for 3s. 4d., without costs.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
3.....	Barnet and District .....	Members' Night.—General Meeting.
3, 4 .....	Beverley .....	Sixth Annual Exhibition.
4.....	Hackney .....	Open Night.
4.....	Isle of Thanet .....	{ Lantern Evening: Crystal Palace Inter-
4.....	Lewisham .....	{ national Exhibition Slides.
5.....	Croydon Camera Club .....	Annual Meeting.
5.....	Leeds Camera Club.....	{ Printing Processes for Pictorial Pur-
5.....	Photographic Club .....	{ poses. A. Horsley Hinton.
5.....	South London .....	{ Building of a Picture. W. E. Tindall
5.....	Southport .....	{ R.B.A.
5.....	Southsea .....	Members' Open Night.
5.....	Woodford .....	Annual Meeting.
6.....	Darwen .....	Lantern Lecture. H. J. Heaton.
7.....	Leeds Photo. Society .....	{ Carbon Printing, or the Gum-bichromate
		{ Process. F. J. Mortimer.
		{ Intensification and Reduction. Mr.
		{ McIntosh.
		Developing Evening.
		{ Principles of Art applied to Photography.
		{ Alex. Keighley, F.R.P.S.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 23.—Mr. J. E. Hodd in the chair.

Mr. T. E. Freshwater showed one of Lumière's stereoscopic transparencies in natural colours. They are made by coating the glass plate with a mixture of gelatine and bromide of silver emulsion, sensitising such film with bichromate, printing under one of the three-colour negatives, and developing and staining the film with a dye of the colour which the first negative requires. The film is then coated with a suitable varnish or other preparation to isolate the first image, when the operations of coating with gelatine, &c., as above described, are again gone through, this time printing under a negative representing one other of the primary-colour sensations. In like manner the image so obtained is varnished, and the third negative printed. The effect of this all is that the



three primary-colour sensations are represented on a triple-coated plate or slide, which, by transmitted light, gives in the stereoscope a very faithful idea of the original, provided that care has been taken to accurately register the three negatives in printing.

The Chairman exhibited what he thought must be the champion of meta dark slides, perfectly workable and constructed for plates, with a vulcanite slide, and weighing only some two or three ounces. Vulcanite, unlike xylonite, was not liable to shrinkage, curling, and the like, and was less liable to go wrong.

#### PACKING OF P.O.P.

The CHAIRMAN said he wished to ascertain the opinions of the members upon an occurrence which had recently come under his notice. In October last a consignment of printing-out paper was dispatched to a man in East Africa (Mombassa), reaching him in November. It was packed up in a number of zinc cases, each holding some three or four packets of cut paper, and soldered up, just as similar consignments had been packed for years past. Some of these were opened in January, but the paper was in such a state that the remaining packages were returned in the following month as unsatisfactory. He found that the paper had assumed a rich, evenly distributed mahogany colour, and, on referring the matter to the makers of the paper, he was informed that the depreciation was entirely due to the method of packing adopted, and that the fumes generated by the heating of the acid flux were particularly responsible. He now brought forward an unopened case of the paper, opened it, and examined the paper. This was found to be of a light mahogany colour, but also spotted and marked in a manner which it would be difficult to attribute to the action of fumes. The Chairman could hardly believe it possible, however, that the small quantity of fumes generated would be sufficient to affect the paper in this manner, and penetrating the many wrappings enclosing the paper.

Mr. FRESHWATER thought it would be better to solder metal cases with a resin flux instead of acid, and that the fumes of the latter would render useless sensitive plates, he knew from experience. The effect was fog, patchiness, and other troubles.

Mr. A. HADDON thought that, in any event, it was impossible to say that certain defects he pointed out in the paper were due to soldering. He found that the action was not only in the gelatine, but in the paper itself. To decide the matter once and for all, the best one could do would be to reproduce the conditions, and see what followed. He also recommended that paper of several different batches, not one, be sent out next time, as a means of ascertaining whether all batches alike were affected. It seemed quite possible that the acid fumes would, in the presence of free silver, turn the same to chloride, and, so far from having a disturbing effect, exercise a preserving influence. He did not think that sufficient hydrogen would be set free by the small quantity of acid used to penetrate the wrappings, and one would naturally look to the edges of the paper for the strongest evidence of the action.

The general opinion was that something more than the hydrogen and acid fumes was concerned in such a complete destruction of the paper.

The HON. SECRETARY stated that the Recorder had found it necessary to resign his position. The Committee were therefore asking for qualified volunteers amongst the members to step forward, and it was hoped that this notification might reach such persons and serve to fill the vacancy with as little delay as possible.

#### PHOTOGRAPHIC CLUB.

MARCH 22.—Mr. F. A. Bridge in the chair.

Mr. E. J. WALL, F.R.P.S., gave a chat on various methods of colour photography now in vogue. Commencing with an exhibition of transparencies made by means of Ives's process, he explained the principles underlying the same. The first step is the taking of three negatives, each through a different coloured screen, the result of which is that we have three negative images in monochrome representing the different gradations and colours in the original. Positives of these images are projected, each through its particular colour screen, and blended upon the sheet, the mixture approximating more or less correctly, according to the illuminant and perfection of the manipulation previously brought to bear upon the subject, to the colours of the original design. Baskets of flowers and fruit, and paintings were shown by means of the apparatus, and an interesting analysis followed, showing the peculiar effect of stopping one or more of the lights from the triple projecting lantern. Mr. Wall went minutely into the question of screen-making. Dry screens or tanks containing fluids may be employed. He preferred to make his own, using thin white patent plate glass and cementing two together with Canada balsam. For the red screen, saffronine and chrysoidine; for the violet, ethyl-violet. For the green screen, naphthol green and picric acid. He had been at one time much bothered by marks in his screens, putting them down to drying marks, but he had since found that they were due to microbes, which found time to propagate, seeing that the films of gelatine forming the screens took twelve to eighteen hours to dry. As an antiseptic he found xylol the best. Touching upon the opinions expressed in many high places that different plates were not to be used in three-colour work, he disagreed entirely. With the screens mentioned he used an Imperial process plate, Lumière's yellow and green sensitive plate, and Lumière's series C. Mr. Wall next went into the questions involved, and the essential differences between three-colour work by projection and by printing. Joly's process was then discussed. Much the same as Ives's process in principle, it differs in having a single negative upon which are recorded the three primary colours. It is effected by the use of a screen combining the three colour screens in one, viz., a screen ruled finely and repeatedly in the three colours. The negative is consequently in lines, and the positive, mounted accurately against a screen similar to the taking screen, will, on projection, give the original in natural colours. The peculiar effect of incorrect mounting of the positives and viewing screens was shown at length, and a number of questions were asked and replied to by the lecturer.

#### FORTHCOMING EXHIBITIONS.

1899.

- April 1-May 13 ..... National Trades and Industrial Exhibition, Bingley Hall, Birmingham. Manager, Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.  
 „ 3, 4 ..... Beverley. T. J. Morley, Toll Gavel, Beverley.  
 „ 12, 13 ..... Plymouth Photographic Society. Hon. Secretary, W. H. Harris, 91, Cobourg-street, Plymouth.

#### Patent News.

THE following applications for Patents were made between March 13 and March 18, 1899:—

- ELECTRIC LIGHT.—No. 5514. "Improved Electric-light Apparatus for Taking Photographic Portraits." G. W. MORGAN.  
 PACKING BOXES.—No. 5528. "Processes and Boxes for Packing Sensitised Material." Complete specification. M. J. STEFFENS.  
 PHOTO-PRINTING.—No. 5561. "Improved Means Applicable for Use in the Production of Photo-prints." L. SHAW and J. HALDEN.  
 SHUTTERS.—No. 5623. "Improvements in Camera Shutters used in Taking Photographs." R. MARTIN.  
 BRACKET STAND.—No. 5792. "An Improved Bracket Stand for Photographic Cameras." E. M. M. SMITH.  
 CAMERAS.—No. 5836. "Improvements in or relating to Photographic Cameras." F. J. A. BERINGER.

#### Correspondence.

\* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\*\* We do not undertake responsibility for the opinions expressed by our correspondents.

#### THE FUTURE OF PHOTOGRAPHIC ASSISTANTS.

To the Editors.

GENTLEMEN,—I am indeed very glad to see you have devoted a half page in this week's JOURNAL to a photographic assistant's future.

In my opinion, as in yours, the outlook is very gloom indeed, unless a Union is established, which is done in almost every other kind of business.

Of course, I quite agree with you, there are a good many assistants who really are not capable, but then there are others who (not from their point of view) are first-class men, and yet cannot obtain berths.

I should very much like to know what employers call first-class men on the whole, as what some call Al workers others do not; also if one has to thoroughly understand every branch of photography before he is a first-class man? Then, it is obvious that they are not young men, although some are quicker at learning than others.

In many cases specimens do not do justice to the man, and one cannot always obtain specimens of one's own work, and I think, if employers will have specimens, it is a great temptation for some to substitute others' work for their own, thereby deceiving the employer.

As you mention, some do not possess the qualifications which they set forth, but I fancy sometimes employers give their verdict before the assistant is given a chance; and, again, I have found from experience that, if one is backward in putting forth his ability, he is judged accordingly.

I only wish you, or some one else, would find your way clear to found a Union. I should do my utmost to show its advantages and increase its members. Then it might be coupled with an employment agency for photographic assistants alone.

I may add before I conclude that I have made up my mind not to forward what remaining specimens I have, as I have lately lost two sets, and I think it most abominable of those who detain them, showing clearly their true character. I only wish all assistants would abstain from sending their specimens, as I think only a trial is fair.

Trusting this will not cover too much space, and thanking you exceedingly for your kindness,—I am, yours, &c., F. S.

To the Editors.

GENTLEMEN,—Re your article in this week's JOURNAL on the above subject, a year or so back I was a retoucher in the employ of a firm of photographers who do a large trade, and whilst so employed came into touch with many of their assistants, so I think my remarks, which are from practical experience, will be of some interest to the many assistants who have been complaining to you of the dearth of employment. To let a little light on the system which this firm works, to fill up vacancies for operators and retouchers on their staff, it was the



rule (and I am told that the rule is still in force) to engage a few smart lads, teach them retouching, and, after a few months' training, to pack them into the first vacancy at very small wages (14s. or 15s. per week); and it so happens perhaps (it often has) that the operator at the branch to which this raw recruit is sent is discharged or leaves. In the meantime this lad has learnt to take a negative, and to save money he is given the vacant post, and thus becomes a full-blown operator. I have also known lads after printing proofs for a few months leave and try for a birth as a "first-class printer." But the real point is, after serving this firm for a time, these assistants fancy they are, shall I say? photographic experts, leave to obtain more money, and so help to fill the ranks of the unemployed "first-class operators and retouchers," and of course another lad is drafted into the "expert's" place, and so the game goes on. After this, can any one wonder at the photographic labour market being overstocked with "first-class assistants?" You, Gentlemen, have indeed hit the nail on the head in the closing remarks of your leader, i.e., "We are sorry to say employers who have second and third-rate studios, and in some instances doing a fair trade, have no more actual knowledge of photography than the assistants they employ." This is only too true.

With regard to salary, it might also interest you, Gentlemen, and your readers, to know the average salary paid to operators and retouchers on the staff of this firm under notice: Operators, 25s. to 30s., in some cases 35s. per week, with "com.," after deducting a large amount for working expenses. Duties of operator (thirty to forty sittings a day), retouch, develop, and, in short, to make himself generally useful. In case of boy operators the salary is smaller. Retouchers, boys, 14s. to 15s.; retouchers, 11. to 25s. up to 28s. They are expected to retouch thirty negatives per day, including heads. For this magnificent salary they have to work eleven hours per day, open on all Bank holidays, including Good Friday. No summer holidays; in fact, no break from one year's end to another. Who would not be a "first-class assistant" under the above conditions?

It would be interesting to have the opinions of your readers on the salaries, &c., given above. Trusting you will find space for this letter, and thanking you for your very able leader, — I am, yours, &c.,

London, March 25, 1899.

G. H. D.

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

G. S. Ellis, 12, Albert-street, Mansfield, Notts.—Three cabinet photographs (busts) of Rev. C. H. Goodman, Tikonko, West Africa.

Rev. C. Steele, Leavenhath Vicarage, Colchester.—Photograph of young pig with one fore part, but two complete hind parts. The pig stands on six legs, and on the back, at the junction of the two hind parts, a single shank grows out, but this shank has two perfect feet.

W. W.—Dorking is the last address we can trace.

G. E. B. (Swindon).—Impossible now to trace the source.

W. H. W. (Philadelphia).—The complete report is obtainable from the Society of Arts, John-street, Adelphi, London, W.C., for one shilling and postage.

M. A. MEYER-BURKLY.—1. Better address Messrs. Newton & Co., 3, Fleet-street, London, E.C. 2. About forty of the leading English photographers are sending about 100 very fine photographs to the Exhibition. By all means visit it.

APPRENTICESHIP.—EMPLOYER. Unless the indentures are duly stamped, you have no hold on the apprentice. He is, *de facto*, a weekly servant, and can leave at any time by giving a week's notice. It is too late now to have the indentures stamped.

ASSISTANT OPERATOR.—There are practically no good books on the subject. Bigelow's *Album of Lighting and Posing* might be obtained second-hand. This would suit you. The Chicago Photo-Beacon Company, Chicago, publish a valuable little book on *Lighting*, by Inglis, price one dollar, postage extra.

COPYRIGHT.—G. F. READWIN (Norwich) says: "I have two negatives, taken for a tradesman in this town, who requires the copyright of same. Will you kindly give me particulars?"—In reply: If the photographs have been paid for, the copyright is your client's; if not, the copyright is yours, and you must make an assignment. We do not answer questions through the post.

ETHER SATURATOR.—S. BIGGS. A good ether saturator is perfectly safe, in careful hands, by those who understand the apparatus and the dangerous character of ether and can safeguard against it. As you seem to have had no experience with the lime light in any form whatever, we should not advise you to purchase a second-hand ether saturator, to begin with at least.

REPRODUCTIONS.—S. SEELEY.—The reproductions by the firm named are, we believe, by a collodion process—not gelatine, but the process by which they are done has not been published. Indeed, we are told it is kept as a profound trade secret, also, that there is little or no hand work on the negatives. We cannot enlighten you further in the matter beyond saying the prints issued are by the carbon process.

FORMULA WANTED.—W. W. says: "Could you give me a formula for making gelatino-chloride emulsion for printing out—one that does not require washing preferred—or an albumen-chloride emulsion for the same purpose? If not, can you give us a house that supplies the same?"—A formula for gelatino-chloride emulsion printing-out paper, is given on page 1040 of the ALMANAC. We know of no albumen-emulsion paper for the purpose. Mr. S. H. Fry, 12, South-villas, Camden-square, N.W., might supply the gelatine emulsion.

STUDIO BUILDING.—R. T. OWEN says: "Should be greatly obliged if you could answer me the following questions:—1. What is the best angle or pitch for a studio roof? 2. Should studio face exactly north? 3. Is there any book or plan to be obtained on studio construction?"—In reply: 1. There is no best, because ideas vary very considerably on the subject; one prefers one angle, and one another. A good slope to the roof is, however, desirable to throw off water and snow. 2. A north aspect is easier to work than any other, but equally as good results may be obtained in any other. 3. Mr. Bolas has written a book on the subject, which may be obtained from Marion & Co., Soho-square.

SPOTS ON NEGATIVES.—J. JARVIS says: "I have a lot of negatives recently taken. I have taken one print only from each, and find them covered with innumerable yellow spots, as though damp paper had been used. Ready-sensitized paper quite dry was used. There is no metallic reduction in the film, which is the case with damp paper. The negatives were unvarnished."—We should suggest treating the negatives with a tolerably weak solution of cyanide of potassium in one part of water to two of alcohol. If the stains are on the surface of the film, this will probably remove them. If, however, they are in the film, we fear there is no remedy. But, as we have not seen the negatives, we can give no very positive opinion.

OPERATOR'S AGREEMENT.—B. W. G. The agreement would, doubtless, be binding if you signed it, but we should recommend you to hesitate before doing so. It seems all on one side, and that not on yours. How far the clause binding you not to enter the service of another photographer, or practise photography on your own account, within so wide a radius, would hold good in a court of law is very doubtful. Unquestionable agreements are void, and the proposed agreement would, we suspect, be looked upon as an "undue restriction of trade," which is against the law. Any how, we should not advise you to sign any agreement unless you morally as well as legally intend to abide by it. As we have said before, it is a very one-sided one, particularly for the small salary to be paid.

DETENTION OF SPECIMENS.—EVIDENTLY ONE OF THE MANY says: "Some time ago I sent to you specimens of my work, together with full particulars of my ability and experience, asking your opinion of same. Your reply was to the effect that I could easily command a salary of 21. 2s. per week. Since then I have sent in several applications in reply to advertisements in the JOURNAL, but all to no avail. A month ago I sent the same specimens as I had forwarded to you to —, asking somewhat less salary. To this day I have not heard from him, although I have written for the return of my specimens, postage being enclosed in the first instance. This week I have sent in two more applications, and have had to excuse myself for not sending specimens. Can it be possible that any one should take a month to decide upon an applicant? If this be the case, I am afraid his business aptitude is not to be envied. Do you know the house at all, as I do not wish to think he would detain property other than his own?"—In reply: We do not know the man. A threat of legal proceedings should be made at once. An employer who detains specimens renders himself liable to an action for damages.

PHOTOGRAPHING TROTTERING HORSES.—A. N. BOYLE says: "I have a commission to photograph, whilst trotting, a tandem equipage, and am doubtful whether I can obtain sufficient exposure with the lenses I possess. The fastest rapid rectilinear lens I have is at quarter-plate T. T. & H. D. lens, working at f-8. I have also a Voigtlander portrait lens (cabinet) which gives approximately an aperture of f-9; but, as this lens is of a form about twenty years old, I doubt whether I should get sufficiently good definition with it, its depth of focus being very slight. Would a Cooke No. III 5-inch f-6.5 lens be rapid enough for such a subject travelling at right angles to the camera, or would a Ross 6-inch Symmetric Anastigmat f-5.6 be better? I could not afford a Zeiss or Goerz lens. Any hints as to exposure and development would be very acceptable. I wish to take the subject on a quarter-plate to enlarge to 10 x 8, using for exposure a T.P. focal plane shutter. Time of day between 11 a.m. and 1 p.m. and in sunlight if possible."—The quickest lens you have is undoubtedly the Voigtlander, and the fact that it was made twenty years ago need not militate against its definition. Of course, the larger the aperture, the less "depth of focus" it has; but the Voigtlander, being a "cabinet" lens, is of longer focus than any of the others, and therefore may be expected to cover the plate better with a large aperture. If stopped down to the same aperture as either of the others, it would have the same depth of focus. Either of the brands of plates named are very rapid. Better use with them the developers recommended by the makers for rapid exposures. You ought to experience no difficulty in getting a good result.

\* Several answers to correspondents and other matters are unavoidably held over till next week.



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## EX CATHEDRÂ.

It was stated in our Foreign News and Notes last week, and had been previously announced, that the Chemische Fabrik, late E. Schering, in conjunction with a paper-manufacturer in Germany, had succeeded in producing a suitable paper for photographic purposes, when it has to be “surfaced” with the baryta coating, as for the gelatine printing-out papers or for collodio-chloride. Having accomplished that, they found themselves handicapped by the fact that the “ring” had bound those who coat the paper with the baryta not to coat any other papers made outside its body. However, it appears the Chemische Fabrik has proved itself equal to the occasion, and is now able to put upon the market a collodine paper of its own manufacture throughout. It is to be hoped that this firm will not stop at that, but will supply the baryta-coated paper for use to others. How much longer it may be again asked, will English paper-makers and surfacers of it allow the photographic paper-manufacture for the whole of the world to remain in the hands of one or two German houses?

In the old days of photography, when the photographic image was more in the paper than on its surface, as in the calotype and analogous process, and purity of material was the great essential, English-made papers were pre-eminent. With paper for albumenising, purity of the paper and more particularly its surface is the essential, but with modern emulsion photography—gelatine and collodion—the baryta or other coating is the chief point for consideration, so long as the paper itself is tolerably free from impurities and is sufficiently hard and strong to withstand the washings, &c., the prints have to undergo. One can quite understand that large firms, with a file of orders in their own special lines—and the paper trade is very brisk just now—will not go out of their way to experiment with photographic paper-making. But there are many smaller factories, we should imagine, who would find it worth while to take up the matter, particularly seeing that, if the experimental paper did not answer for photography, it would be saleable for other purposes. There are many papers now in the market that would, doubtless, answer if they were suitably coated with the baryta. If so, then it simply resolves itself into applying the coating. Here, then, is a chance for English paper-surfacers, or “enamellers,” and a fortune awaits them from English consumers alone.

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ACCORDING to *Science*, a new method of photographing in natural colours has been discovered by Professor R. W. Wood, of the University of Wisconsin. The colours are said to be obtained by diffraction; and, though at present the production of the first finished picture is somewhat tedious, duplicates can be printed as easily as ordinary photographs are made. The pictures are on glass, and are not only colourless but almost invisible when viewed in ordinary lights, but, when placed in a viewing apparatus, consisting of a convex lens on a light frame, show the colours of nature with great brilliancy. The principle is that the picture and the lens form spectra which overlap, and the eye placed in the overlapping portion sees the different portions of the picture in colour depending on the distance between the grating lines at that place. Professor Wood says the finished picture is a transparent film of gelatine with very fine lines on it, about 2000 to the inch on the average. The colours depend solely on the spacing between the lines, and are pure spectrum colours, or mixtures of such, the necessity of



coloured screens or pigments, used in all other processes except that of Lippmann, having been overcome. The pictures can be projected on a screen by employing a suitable lantern, or can be viewed individually with a very simple piece of apparatus consisting of a lens and perforated screen mounted on a frame. We agree with a remark of our contemporary, *Nature*, that it is difficult to form an opinion upon the method or results from the information so far available, and we hope that further details will soon be published.

\* \* \*

A NOVEL suit in connexion with radiography has been brought before the Civil Tribunal of the Seine, says the Paris correspondent of the *Standard*. A lady sued a radiograph specialist for 200*l.* as damages for serious burns in the course of an operation in which the Röntgen rays were brought into use. It was stated that the patient was suffering from some internal complaint, and it was decided that, as she was averse to an operation, radiographs of the affected parts should be obtained, the better to judge of the nature of the disease. Three were taken, one with forty minutes' exposure, the second with forty-five minutes', and the third with an exposure of an hour and a quarter, but with a negative result in all instances. After the second exposure, it is stated, the skin was wealed, as if it had been burnt, causing, in a few days, a painful wound and great suffering. For this the damages were claimed. It is tolerably well known that the continued action of the X rays on the cuticle of different individuals varies greatly. In the medical evidence called for the defence, one doctor said that the exposure of one hour could be endured by ninety-nine persons with impunity, while with the hundredth burning would ensue, even with a quarter of an hour's exposure, in the same way that some persons could absorb a gramme of morphia without ill effect, while others would be poisoned under similar conditions. In the end the Court reserved judgment, and it will be interesting to see what that will be.

\* \* \*

FROM Sunday last till October next the National Picture Galleries will be open to the public on Sunday afternoons. The numbers visiting them in previous years testify as to how the Sunday opening is appreciated generally. It affords photographic assistants who are engaged throughout the week the opportunity of visiting the galleries and studying the works of the greatest masters. We call special attention to this matter here, inasmuch as at the present time assistants generally are complaining loudly of dearth of employment and low salaries. At the conclusion of the article on this subject in our issue of the 24th ult., we made the remark "that the more proficient a man is in his work the better chance he has of getting employment, and the better chance he stands of retaining it." As we then pointed out, there is now little to learn in photography, so far as the mere exposure and development of dry plates is concerned. The chief thing, however, to learn is lighting, posing, and treatment of the sitter in the studio, and, in the case of landscape work, the selection of subject and the proper conditions of light at the time it is taken. It is in these matters that the skill of the present-day operators is gauged, and it is in this direction that first-class houses complain of the difficulty of getting really good operators, even at very liberal salaries. During week days *employés* have very little opportunity of visiting the picture galleries, but now they have, on the Sunday afternoons, but how many do so for the purpose of

improving their minds in what is really the most important part of their business? The National Gallery contains the best works of the old masters, the Portrait Gallery is devoted entirely to portraiture, and the Tate Gallery, on the Embankment, to the works of modern painters. No photographer visiting any of these exhibitions can well come away without profiting something in the most essential portion of his work, choice of subject, lighting, posing, &c.; but, as we have just said, how many avail themselves of this chance? We recommend these remarks to those who really wish to improve themselves in art matters and their condition in life.

\* \* \*

MESSEURS. CADETT & NEALL, of Ashted, announce that they are now placing measured orthochromatic light-filters on the market. These light-filters are adjusted for the Rapid Spectrum plates, and are designed to enable paintings, flowers, landscapes, and any coloured subjects to be rendered in accordance with their colour luminosities. It is pointed out that the light-filters are of no value with any other colour-sensitive plate than the Rapid Spectrum. Each light-filter is tested by Mr. Cadett before being sent out, the testing instrument being Captain Abney's colour sensitizer.

\* \* \*

LAST week we alluded to the fact of the arrest of three students with photographic apparatus, as illustrating that the spy scare had not yet subsided in France, and that it was not confined to the frontiers. Since then there have been other arrests of so-called suspicious individuals, out of which several of the French papers have made much sensational capital. All this tends to bring the spy scare to an acute stage, and necessarily also bring about additional vigilance and officiousness on the part of the police and other authorities. Hence this further warning to English photographic tourists in any part of France. We should specially advise every tourist with photographic apparatus in France just now to be provided with an English passport, which may be obtained at the Foreign Office without difficulty and at a nominal cost. An English passport will not, of course, keep its holder out of a difficulty, but it will be of great service in helping him out of it if he inadvertently gets into one. Passports are not now necessary in France, Germany, Belgium, or Holland, but it is well for photographic tourists in either country to be provided with one. Once obtained, it does for all time and all countries.

\* \* \*

THE Emperor Francis Joseph, it is stated, has conferred on Herr Leopold Horowitz, the famous Vienna portrait painter, the medal of Honour for Art and Science for his posthumous portrait of the late Princess Elizabeth. This exceedingly fine portrait is now in the Spring Exhibition at Vienna, where it is said to be the chief centre of attraction. The portrait was painted entirely from prints and photographs, and we believe the artist had fewer of these to work from than he would have done of any other Royal personage in Europe. The late Empress had a very decided aversion to sitting for her portrait—more so than the majority of Royal personages, who, as a rule, are rather pleased than otherwise for their portraits to be circulated amongst their subjects. Although so averse to her own portrait being taken, the late Empress took a great personal interest in photography and all pertaining to it; therefore it is a little surprising that there are so few photographs of her in circulation.



## FILM TROUBLES.

## II.

BEFORE leaving the subject of frilling, it will be well to point out, after again emphasising the danger to be apprehended on this score from films puckered or creased through crooked rewinding on the spools, that, when a number of spools are to be developed at once, it is always advisable to ascertain if they belong to the same batch. From the most noted makers batches liable to frill occur; hence, if a trial spool be all right, no trouble need be anticipated, while, if it frill, forewarned is forearmed, and it must be a very bad sample the frilling tendencies of which cannot be kept under once they are known to exist. It will, of course, be remembered that the evil usually occurs in washing after fixing.

From washing, the next step is drying. The makers recommend that films be soaked in a weak solution of glycerine before they are put to dry. For convenience and handiness in printing operations this is an incontestably valuable plan. Still, some old silver printers shudder at the very thought of any such treatment. "What!" they say, "soak a film in glycerine before printing? Why, it is hard enough to keep a film dry under ordinary conditions, to say nothing about making it damp on purpose." To a certain extent they are quite just in their strictures, as we well know from the many prints stained with silver that are brought before our editorial notice. But with care in seeing that the films really are dry before putting them in the printing frame, and that P.O.P. or collodion paper only is used for direct printing, disasters will be few; but to use film negatives at all, or printing more than a copy or two (and that is unwise), or to use them once only when glycerined, if albumenised paper is the medium chosen, is simply to court disaster. Silver stains sooner or later are almost inevitable. We have just alluded to the need for care being taken always to see that the films are dry before printing, and this is by no means a mere *façon de parler*; a glycerine film looks dry long before it really is so. There is no doubt the large majority of spool-users employ glycerine in the way we are discussing, but, where a determination to avoid it exists, the drying will be a difficulty. We have seen it best overcome by rolling the spool (film out, of course) tightly round a long wooden roller, securely pinning the corners by drawing pins. When dry and kept in a moderately cool place, rolled up, film outwards, little trouble will be experienced.

There is one point in regard to the setting off of silver on to the film from the printing paper that should be noted; all risk can be obviated by a preliminary varnishing of the gelatine surface with one or other of the many varnishes now to be had for the purpose, the celluloid varnishes being perhaps the best, though the smell of the amyl-acetate solvent is much objected to by many. It is out of question to attempt to pour the varnish on and off after the fashion of the wet-collodion expert, but with little skill a sufficiently even covering may be given with the use of a broad camel's-hair brush.

In connexion with the drying of negatives, a timely caution may be of use. When a print is wanted quickly from a newly made glass negative, it is a common enough plan to soak it in one or two changes of spirit, put in a current of air, or blow upon it with a pair of bellows, and have it dry in half an hour. This plan is entirely to be eschewed in the case of film negatives, as, if so treated, they curl and pucker to such an extent that it is impossible to get a print of any sort from them. If by any chance any of our readers should have essayed this

mode of drying, with its inevitable sequence, he may, however, still get a print by putting the film between two glass plates, and, placing it in a copying camera, get a developed print fairly sharp if he stop the lens down pretty freely. We have seen a first-rate print from a hopeless wreck of a film negative obtained this way.

We have one final caution to give with regard to film negatives. Those accustomed to the handling of glass negatives must not imagine that celluloid will bear the same treatment as glass, nor that thin shavings of that material (which is, indeed, an exact description of spool films) are equivalent to glass. They are practically as transparent as glass, but there their likeness ends. They will not break, but, *per contra*, the film has not the same tight hold as on glass, and the contractile nature of the gelatine twists and curls the celluloid under very slight provocation. Therefore, all film negatives should be kept in as cool a place as possible, and never allowed to lie loosely about, as, if such care be not taken, they may become unmanageable cellulosidal curls and contortions; while, if they are allowed to remain in the sun for any length of time, the film may actually become detached.

**Dr. Russell's Experiments on Hydrogen Peroxide.**

—Though the subject is one of such surpassing interest that it is too important to pass by in small paragraph, we may yet call attention to the most remarkable field of experiments opened out by his researches. All the hitherto occult causes of fogging put down to electrical excitations, sunlight, &c., are capable of explanation by the one simple cause, the production of peroxide of hydrogen, the action of which upon the film produces effects similar to those of light action. The objection that this chemical substance could not pass through solid bodies is entirely done away with by Dr Russell's further experiments in this direction. He showed that the peroxide was capable of passing through a variety of solid substances, and that many bodies could imbibe it, so to speak, and continue to give it off for a lengthened period, so as to act upon the prepared plate.

A VERY delicate reaction to indicate its presence, or otherwise has recently been described in the *Chemical News*, by Mr. Edgar S. Barralet, and may be of great use in connexion with work in Dr. Russell's direction. The delicacy of the new reaction is its great charm, and some idea of it may be formed when it is stated that it is only when the peroxide is present in very small quantities that it may be pronounced with certainty to exist in the tested liquid. When the latter is so dilute that no reaction could be discovered from potassic bichromate, or permanganate, or calcium hyperchlorite, or other oxidising agents which might be confused with peroxide, the latter, if present, is shown in a pronounced manner. The following is the simple process: Solution of potassium ferrocyanide is added to a solution of a ferrous salt to the production of a pale blue precipitate. Peroxide would oxidise this to the dark blue, "Prussian blue," and, when present to the extent only of 1 in 165,000 parts of water, is capable, if about fifteen drops only are taken, of intensifying the pale blue of over half an ounce of the pale blue precipitate. The latter should be either freshly prepared or kept in a bottle under a layer of petroleum.

**Persulphate of Ammonia.**—Those who employ persulphate of ammonia for reducing negatives, especially if the latter tend at all in the direction of delicacy, should adopt a precaution which may often save them at least some uncertainty. When a fresh solution of the persulphate is made with ordinary water, or even with rain water, it will generally, when first applied to a film (unless the latter has been very imperfectly washed and still contains much hypo), at once form a dense white flocculent precipitate, part of which is suspended in the solution, part loosely deposited on the surface of



the plate, and part again enters into combination with the image. This is due to the salts, chlorides, carbonates, and sulphates contained in the hard water, which, directly the persulphate begins to reduce the silver, attack the latter and throw it down. The portions suspended in the solution and deposited on the plate are not of much moment except in so far as the latter may, to a slight extent, change the appearance of the image temporarily, and so lead to an incorrect judgment of the progress of the reduction. But the third portion, which enters into combination with and bleaches the surface of the image, plays a more dangerous part. Not only does it perform a certain amount of reduction on its own part that is not evident until the "stop bath" of sulphite of soda is applied, but it covers the surface metallic image with a thin casing of chloride and what-not, and stops, or partly stops, the redeposition of silver on the surface that causes the selective action of this reducer, and prevents the annihilation of the fine details. Sulphite of soda, it must be borne in mind, is a fixing agent, second only to hypo in its power, and, besides instantly stopping the reducing action, this solution performs the equally useful part of freeing the reduced film from chloride and carbonate of silver. The actual reduction ensuing on this operation may not be great, but it may easily be sufficient to just spoil the gradations of a delicate negative. But the other effect is more serious, and entirely alters the character of the reducing action, robbing it of that peculiar selective power which renders the persulphates so valuable. To prevent the formation of chloride and carbonate of silver in any of these ways, it is only necessary to immerse an old and useless negative in the solution before use for its legitimate purpose, and to then filter out the precipitated silver.

#### **The Value of Sulphite of Soda as an Application to Negatives after Fixing.**

While on this subject, we may perhaps be allowed to express the opinion that the "stop bath" of sulphite of soda should invariably be used after persulphate of ammonia. We know it has been said that free and copious washing in plain water will serve the same end just as well, that is, will arrest further action of the reagent; but even with this we do not agree—though that is a comparatively small matter in our estimation. Granted it does, the function of sulphite still remains of eliminating or neutralising the somewhat prolonged action of a very dilute solution of silver upon the gelatine. Even after the treatment given above, the solution of persulphate in use soon becomes opalescent, milky, and gradually deposits a considerable quantity of white flocculent matter. It becomes, in fact, saturated with sulphate of silver, which, not being a very soluble salt, is soon thrown out of solution. Speaking from memory, we believe the solubility of the sulphate at ordinary temperatures is under two grains to the ounce of water, so, as we cannot expect handsome tabular crystals like the nitrate, we must accept the powdery flocculent substitute referred to; but, if the saturated solution be weak, it is still powerful for evil, as any one may soon learn by dropping a few drops of this opalescent mixture on a valuable engraving. If it acts with fair rapidity upon paper, it is very certain that its effect on gelatine will be not less marked, hence the integrity of a negative reduced with persulphate is a doubtful question in the absence of the use of sulphite or hypo, though the former seems in every way preferable. The first action is to convert the soluble sulphate into insoluble sulphite, which is afterwards removed by a mild form of fixation, the solution of sulphite of silver in sulphite of soda having, so far as we are able to ascertain, no action on gelatine or organic substances, and it is not sensitive to light.

#### **The Action of the Soluble Hyposulphites of Soda and Silver on Films and Paper.**

*Apropos* of the action of soluble silver salts on negative films, we may mention that we have often, when discoursing on hypo eliminators and the importance of removing all possible chance of such effects as we have found arising from the action of silver salts, had it pointed out to us that the double salt formed in the process of fixing, and known as argento-sodic hyposulphite, is itself a soluble silver salt, is formed in

the pores of the film itself, where it must necessarily act for some time, and is finally only "evicted" by means of plentiful washing, and that, according to our theory, this should be as bad as are other soluble salts of silver, if not worse, on account of its composition. Quite true so far as the first part of the argument is concerned, but utterly wrong as regards the finish. In order to work harm, the soluble salt or solution must have an affinity for organic matter, must, in fact, have a tendency to combine and form a silver compound. Nitrate of silver, for instance, or any of the simple silver salts, the haloids, or carbonate, or insoluble organic salts when dissolved in ammonia, in fact nearly all solutions containing silver in solution will form such combinations when applied to paper, linen, or similar substances, and, if they once make contact, it is practically, we may say absolutely, impossible to remove the effect by means of simple washing. Sooner or later, in the dark and protected from moisture, but much more rapidly under the action of light and damp, discolouration takes place, as only too many photographers of an earlier era are well aware; but the double hyposulphite of silver and soda has no such tendency. Coated on to paper, even in concentrated solution, it is insensitive to light, though exposure to the atmosphere oxidation, in fact, quickly turns it yellow. We have purposely separated the two double salts of hypo and silver for the special purpose, and find that, though both are easily oxidised and made to deposit sulphide of silver, a concentrated solution of the "sodic" salt, which alone should be present in a properly fixed print, will show not the slightest change beyond general yellowing after weeks of exposure to light. Further than that, if a sheet of albumen paper, dipped in this solution and dried, have one-half of it again dipped in four or five changes of pure water to remove the salt, it will bear free exposure to the open atmosphere without any change of colour for months.

#### **Another Photo-astronomical Achievement.**

Photography among the stars has scored another success. We read that Professor W. H. Pickering, of Mr. Lowell's observatory at Flagstaff, Arizona, has discovered, by photographic means, another satellite of Saturn. It is only a telescope of very large aperture, if any at all, that could render this new satellite visible. The photograph showing this most recent stellar *débutant* was presumably taken at Arequipa.

#### **THE BATTLE OF THE TONING BATHS.**

By the last batch of issues of THE BRITISH JOURNAL OF PHOTOGRAPHY that has come to hand at the remote place whence I write, I see that the battle of the toning baths for gelatino-chloride, gelatino-citro-chloride printing papers, known by various trade names, some of which names are execrable, rages as furiously as ever. It mostly refers to the old question of mixed toning and fixing *versus* separate.

What I have just read makes me wish to put before your readers a method of combined toning and fixing which reduces the producing of gelatino-chloride prints to the greatest simplicity possible. I have published the process before now, in fact when I first worked it out just about twelve years ago, at which time the paper referred to was very little used, there being, if I remember rightly, but one brand on the market. I could not then, however, say of it what I can now, namely, that it gives more permanent results than any single bath that I have ever used, or than any separate baths either. Of course I speak comparatively when I use the word "permanent," for no silver print can be called permanent in the absolute sense of the word.

When it is said that some single print on silver paper—albumenised for example—has kept for thirty years without showing any sign of falling off, no proof of permanency in any sense of the word is given; but when it is stated, as I can state of prints toned and fixed by my bath, that on various kinds of paper, between the time of twelve years ago and half a year or so since, many hundreds in number, not one has, to my knowledge, faded, and only a few have "gone yellow in the whites," at least a strong presumption of comparative permanency is made out.

Another reason for presuming permanency, in the case of the results of the bath that I advocate, is that the prints fade less under the influence of a bichloride of mercury solution than those toned by other baths, and this, I believe, simply for the reason that more gold is deposited. The



bath is not a cheap one. It takes more gold to tone a sheet of paper with it than with any other bath I know of; but it is many years since I stated, in these columns, the opinion that toning baths economical in gold were by no means to be encouraged, but, on the contrary, those that used the most gold, so long as that gold was all deposited on the image.

The general principles of the particular bath I refer to are as follows:—

1. A very strong solution of hypo, so as to make sure that the prints are thoroughly fixed before the toning is finished.
2. A comparatively strong solution of gold, otherwise the toning is intolerably slow.
3. The neutrality or slight alkalinity of the bath, to be maintained even if an acid paper is used.
4. The same solution never to be used twice.

My formula has been modified from time to time by way of improvement, and has also been more or less altered for different kinds of paper. I have not with me the notes of all these modifications, but give below instructions for the use of what may be considered a typical bath. The paper is to be printed a little deeper than for most toning baths.

The following is made up:—For each sheet of paper 22×17, or proportionately for other sizes, the following bath,—

Hypo.....	2 ounces.
Borax.....	80 grains.
Chloride of gold.....	2 „ *
Water, up to .....	8 ounces.

To this is added, say, thirty or forty grains of powdered chalk. This does not dissolve unless the bath tends to become acid. Otherwise it remains as an inert powder at the bottom of the dish. It might seem that such a powder would be likely to “dirty” the faces of the prints; but, as a matter of fact, it does not.

The bath should be used at as near 65° F. temperature as possible.

The prints are taken unwashed, as they have come from the printing frames, and are placed dry, face downwards, in the solution. The rest of the process is the usual one. The colour is judged of best by looking through the prints. As all sensitiveness is lost in a very short time, generally about a minute, daylight may be used; but I should fear to use it very strong lest the hypo-silver solution should be acted on by light on the surface of the paper. The time of toning should be about ten minutes.

I generally tone to a very deep brown. A purple can be got with some papers, but I have very seldom, in fact, I suppose, I should say never, been able to get a good actual black.

The quantity of solution for given area of paper is so small that there is, say, only half that originally mixed when a batch of prints has been toned, but this depends greatly on the thickness of the paper; of course, this is worth keeping for residues by those who work on a large enough scale to make gold residues a matter of consideration. A first washing water would certainly also contain some gold, but I have never gone into this refinement. Of course, a thorough washing is needed afterwards, and a hardening bath may be used if it is found necessary.

I ought to state that a couple of years or so ago I sent a sample of prints, toned by the process I have described, to one of the makers of printing-out papers, having, I believe, a very large sale. The firm answered to the effect that the tone was admirable, but that the whites were impure—were yellows, in fact, not whites. Well, I could not see the yellow on simply looking at the prints, nor could any of several people I referred to see it, though one of them was a professional painter.

We all could, however, see a slight yellow tinge by contrast when a sheet of pure white “double cream-laid note paper” was superposed over one half of the print. On, however, washing, fixing, washing again, and drying a piece of the very same brand of printing-out paper, there was no comparative yellowness to be seen as regards the prints; but *this paper itself* was slightly yellow in comparison with the pure white note paper. It is true that the printing-out paper was not brand new in either case. Brand new printing-out paper is not to be had in the Far East; but it had not been kept for nearly the limit of keeping time mentioned by the makers.

\* This quantity is variable. In the first place, the so-called chloride of gold of commerce is very variable as regards the quantity of gold contained. I assume here the use of the best make, containing very nearly fifty per cent. of metallic gold. Then, different papers need different quantities of gold, and still again it is evident that a delicate vignette needs very much less gold than a print with dark shadows, the image extending to the edge of the paper. The matter is very simple, however. If two grains involves very slow toning, the quantity is to be increased. Three grains is nearly always sufficient.

I may mention that the makers stated their inability to tone with my bath at all. The reason was simple, they had used just four times the quantity of water that I recommended! I have used a great deal of their paper since, and have not altered my concentrated bath.

As to yellowness again. I cannot consider a yellowness so slight as to be imperceptible except by comparison with an exceptionally white paper to be of any consequence at all. Indeed, I know no reason why yellowness should not be encouraged in many cases, except that the yellow shade so often seen on old silver prints is an unpleasant one.

A pure white paper is generally avoided in the case of etchings, photo-gravures, and in many other cases of art work. The large quantities of paper exported from this country (Japan) to Europe and America are none of them pure white. When Mr. Mortimer Menpes was in Japan a couple of years or so ago, he examined all samples of Japanese paper he could get hold of, and chose for water-colour work one with a decidedly yellow tinge.

I may say that, in the few cases in which prints toned by my bath have been turned out “yellow in the whites” or have become so, it has been because there has not been enough hypo in the solution, or that the prints have been allowed to stick together. I think there has not been a case of this yellowness when the manipulations have all actually been my own.

I have known no case of double toning except in attempts to get a pure black—attempts which, as already indicated, have been failures.

W. K. BURTON.

#### A NOVEL MODE OF GOLD REDUCTION.

We have often inveighed against the supineness of so many photographers in the matter of collecting hypo residues, and we have every reason to believe that it is still most rare to find this collection to be carried out. “Oh, it is such a nuisance to worry with pieces of zinc,” or, “Oh, we can’t do with the smell from the use of sulphide,” are the replies we continually hear. We should again point out that, from the hypo used for fixing gold-toned prints, the silver is frequently worth three or four shillings an ounce instead of the twenty-seven or eight pence obtainable for the pure silver itself. The cause of this difference is the amount of gold which is carried in to the fixing bath. The question arises, Could this gold itself be extracted without any trouble and leave the silver?

Some time ago the reply would have been in the negative, but recently an account has been published describing a method of gold-recovery from cyanide solutions which is largely used in Australia. The actual chemical operations involved are, so far, quite unknown, but in practice the recovery is a success, but costs one shilling and eightpence per ounce of gold. The liquid containing the gold is passed into tubs holding about half a hundredweight of charcoal. The gold then becomes deposited upon the charcoal, and, when a sufficient amount of liquid has been treated, the charcoal is burnt, and fused with borax to double the amount in weight of the ashes produced. At the mills where the process is in operation, as much as 10,000 pounds of charcoal are in operation at once. If, now, where the printers or their principals will not have the hypo treated for silver, surely there would be no difficulty whatever in letting the liquid run into tubs of charcoal, and periodically collecting the latter. It may be estimated that gold equal in value to the silver wasted would at any rate be collected if the plan were feasible with hypo as against cyanide.

#### KROMSKOP PORTRAITURE.

ABOUT a month or six weeks ago I equipped myself with the necessary apparatus for working the Ives process of photography in natural colours.

I was told by professionals (I myself am an amateur unknown to fame) that portraiture by this process was most unsatisfactory, owing to the sallowness of the complexion and want of sufficient colour in the cheeks, lips, &c.

But, portraiture being my hobby, I determined to try it, having an idea that the defects mentioned might be remedied by ordinary retouching with a lead pencil on the negative.

I tried, with results so satisfactory that the Photo-chromosome Syndicate’s officials were good enough to express themselves as being quite delighted with them. They are, at all events, good enough to justify me in thinking that there are very great possibilities in the process, for the little pictures have all the good qualities of photographs,



including that of likeness, which few paintings can approach, and, in addition, the delicacy of texture and of colouring of a good miniature.

The Ives process must be pretty well known by now; but, in case any of your readers are unacquainted with it, it is essential that three separate negatives are taken through screens of the three primary colours. (Apparatus is on the market for taking these in the simplest possible manner on one plate.) From these negatives three transparencies or positives on glass are printed, which, when mounted and placed in the instrument called a kromskop, are exactly superimposed, and each is illuminated by appropriately coloured light. If the relative exposure has been correct, the effect is an absolutely truthful representation of the natural colours of the objects photographed.

The three negatives are, of course, colourless, as also the transparencies made from them; but, for convenience sake, I shall refer to the negative made through the red screen as the red negative, to the transparency made from it as the red positive, and similarly for the green and blue.

I mentioned above that where this process has failed for portraiture hitherto has been in the sallowness of the complexion, &c., and it is without doubt true that, although you may get all the colours of the dress and surroundings absolutely true, the flesh tints will appear pale and colourless. Why this is so I am not prepared to say. Possibly artists have so accustomed us to flattered complexions that it has grown to be a habit with us to expect them.

The remedy, in the Ives process, lies in retouching.

Ordinary retouching can be carried out in the usual way on all three negatives equally. When that is done, retouching for the alteration of colour commences.

The principle is simplicity itself. Adding density to any portion of, say, the red negative makes that portion of the red positive lighter, and therefore, when put into the kromskop, it will let through more red light. In other words, increase of density of any portion of the red negative means an increase of red in the corresponding portion of the picture.

The sallowness of the complexion vanishes therefore when you put a bright spot of retouching on the cheeks and another on the lips. Similarly, the blue of the eyes (if they happen to be blue) can be increased by adding to their density on the blue negative.

If density is added equally to two negatives, the result is an increase of the combination of those two colours; for instance, add to the red and green, and you will get more yellow; add a good deal to the red and rather less to the green, and you get more orange, &c. Density added equally to all three negatives gives more white.

It is very difficult to judge exactly how much colour the retouching will give, but this is not a serious drawback, for it is a good plan to put rather too much on the negative, and take out the excess by retouching the positive.

All that has to be remembered is that retouching, say, the red negative adds to the red in the result; retouching the red positive subtracts from the red in the result.

It will generally be found that a portrait is more becoming if the whole of the picture is slightly redder than nature. This can be accomplished in many different ways, e.g., by giving a slightly longer proportionate exposure to the red when taking the portrait; by intensifying the red negative; by reducing the other two; or by intensifying or reducing the positives as necessary. But perhaps the simplest plan is, when making the transparencies, to print the blue and green for a few seconds longer than the red. It is obvious that errors in the original proportionate exposure can be corrected in the same way.

The one great and unavoidable difficulty is the very long exposure necessary, for the sitters must, of course, remain absolutely still while three negatives are made. Speaking roughly, it will be found that the exposure for the red will be forty to sixty times that which would be given with the same plate, light, and stop for a monochrome portrait, and the other colours will be in proportion. I have got very satisfactory negatives by electric arc light, using a Dallmeyer quarter-plate portrait lens at its full aperture,  $f/2.8$ , with exposures of thirty-five seconds for the red, twenty-five for the green, and ten for the blue, on a Cadett special rapid spectrum plate marked H. & D. 75.

I have no studio, but, under favourable conditions, by daylight, these exposures could be very much reduced; and, further, Messrs. Cadett & Neall make much more rapid plates than the one I have quoted. They have just supplied me with some marked H. & D. 111, and with a small number marked H. & D. 218, these latter being about three times the speed of H. & D. 75.

A further difficulty is that, owing to the very small size of the

pictures, the retouching is very delicate work. My kromskop is of the pattern known as the Junior, or non-stereoscopic, and the pictures are only about  $2\frac{1}{2} \times 2$  inches. But the Photo-chromoscope Syndicate have just made me specially a multiple back and colour screens for plates of  $9\frac{1}{2} \times 4\frac{1}{2}$ , or for three-quarter plates side by side, and they are building me a special kromskop, which will take this size, quarter-plate, either vertically or horizontally. I understand they contemplate later on making this size for the market.

In conclusion, I should like to point out that, as I have only been working this system for six weeks, and that fitfully, I make no pretence to be considered an authority on the subject, but I hope that my remarks may prompt more experienced photographers than myself to try it, and communicate their experience to your columns, whereby I shall be the gainer.

L. WALKER MUNRO (LIEUT.).

### FOCUSsing BY SCALE.

SINCE the article on focussing by scale appeared in our issue of the 3rd ult. we have received several inquiries as to how the scale is to be verified, as we recommended it always should be, in hand cameras of the magazine type. The obvious way to do it is to place a piece of finely ground glass in the position occupied by the plate and carefully examine the image upon it, at the corresponding different distances marked on the scale, with a magnifier. But that is not always possible with some cameras of this class. It may, however, be done by a "trial-and-error" method as follows. Set the pointer at the infinity mark and take a negative of some distant object, then rack the camera out a trifle, say the thirty-second of an inch or a little more, and expose another plate, and then a third with the pointer a similar distance within the scale mark. Then develop the plates. If the negative, with the index set to scale, is the sharpest of the three, it may be taken that the scale is accurately adjusted for infinity. But it must not be assumed that, because the scale is accurately marked for one distance, it is so for all. Hence other trials are necessary. Now place some object—say small printed matter, or better still a watch dial, at a measured distance corresponding with the shortest marked on the scale, which we will imagine is six feet, and expose three other plates, the one with the pointer adjusted to the six-foot mark, the others; the one with the index set a little within, and the other a little without it. If, again, the negative with the pointer at the mark is the sharpest, it will be clear that this scale is right for infinity, and also for the nearest distance. It is well, however, to verify the scale for a middle distance in the same way in order to make sure that the scale is accurate throughout. If the scale for infinity, the nearest and the midway distances are found to be correct, it may be assumed that it is for the other distances. In making these tests it is advisable to make them with a stop in the lens of the size next that of the full aperture.

This trial-and-error method of testing possesses some practical advantages over the ground-glass way, inasmuch as, if the chemical and visual foci of the lens are not coincident, which they are not in all of the compound lenses with which some cheap cameras are fitted, the sharpest focus point is arrived at. That is not the case with the ground-glass visual test. We have here assumed that glass plates are used; but, with cameras with rollable films, the want of sharpness in the negatives may sometimes be due, not to errors in the scale, but to a buckling of the film, or its not laying flat in the focal plane of the lens. Therefore in this instance the blame should not be laid on the scale, which may be rightly marked. Rollable films of celluloid that have long been stored in a warm place contract more at the edges than they do in the middle; hence, when in the camera, they do not lie flat, but bulge in the centre, and thus do not do the lens justice, though the scale be accurately arranged.

### LIVE, AND LET LIVE.

To limit an exhibition to some particular branch of Science or Art should not, of necessity, cause embarrassment to a selection committee. But it cannot be denied that opportunity for discernment and judgment arises where the scope of an exhibition is not a very wide one. Wide indeed is the field of Art, and many and diverse are the channels along which it works. While all pictures do not exhibit Art, Art exhibits all kinds of pictures, produced by all kinds of means. So that the selection committee of an Art exhibition would not be long in deciding upon the eligibility of a thing, however much that same committee might differ on the merits of that thing to be chosen.



The scope of a photographic exhibition, however, is not, of course, so wide. An exhibition of photographs is held to mean an exhibition of prints (whether viewed by reflected or transmitted light), produced by photographic methods. The selection committee of such an exhibition should therefore, strictly speaking, reject any print which did not fulfil the above condition. Governed as it is by the objects of the exhibition, the committee should, still speaking according to the literal meaning of things, reject any print which is not produced by photographic methods, that is to say, by the action of light, however æsthetic the result might be.

Now, year by year, criticism of the action of selection committees of photographic exhibitions waxes louder in sound and greater in quantity. More and more complaints are heard of pictures being hung in which some of the work is not performed by the action of light. First of all, we have the uncompromising hostility of those who taboo what is called "faking" by some, "control" by others. Then, in a less complaining tone, we have the challenge of the school whose spokesmen limit legitimate "faking" to the production of that which cannot be produced by what, for convenience, may be styled *ordinary* photographic methods. All this criticism is perfectly natural. It is the inevitable accompaniment of efforts which seek to make photography pictorial instead of merely topographical. It evidences the battle which has been for some time proceeding, with a somewhat spattering fire, between the Old School and the New. This battle is really a contest between a rigid regularity on the one side and mobility on the other, and, as usual, there is something to be said for both sides. It is certainly obvious that an exhibition containing a large amount of work which has not been produced by photographic methods is not exactly a regular photographic exhibition. Is it unreasonable, then, to maintain that in a photographic exhibition all the prints should have been produced by photographic methods alone? We cannot brush aside, as if it were merely *persiflage*, a certain remark which has been made, that where a print produced from a landscape negative, combined with a sky invented by the artist, is admitted as a photograph, it would be equally sensible and proper to allow hanging room to a print from a cloud negative combined with a landscape invented by the artist. On the other hand, to place a ring fence round the field of photography looks rather like a *manœuvre* to keep those who have the ability to extend that field within the narrower limits of those who have not. To drive workers within those limits, and to keep them there, would inevitably stop the production of what cannot be denied is something cleverer than topographical photography. It is unwise to prevent effort from working upwards.

Various, indeed, are the attempts to define and declare what is legitimate photography. Total non-interference with the operation of lens and chemicals is simple if unambitious. Between that and following one's own disposition to produce from a photographic basis the best that hand and brain can evolve, without showing any great particularity as to the methods employed, there is a great gulf fixed. The claim to create any effect which did not exist when the plate was exposed, so long as that effect is produced by light action, is an attempt to regularise the position of prints which contain more or less artificiality.

It is unfortunate, but true, that the most unfettered work above mentioned gives rise to some amount of misgiving to the reflective person who views its consummation on the walls of a photographic exhibition. Ought it to be there? We cannot save our conscience, as we may when we examine a clever example of "shading down," or a landscape produced by the neat combination of two negatives each taken miles away from the other, by comfortably saying, it is all done with light for a medium. What can we say about those skies which owe their invention to the brush?

It does not seem generally recognised what the growth of the lately revived process of producing a print from a photographic negative, now called the gum-bichromate process, actually means. We have in this practically new method of printing from a photographic basis a power more plastic to the touch, more responsive to the wishes of the worker than any of the generally used processes. It transforms the impersonal into the personal. It can change a photograph of glaring mid-day, full of microscopic detail, absolutely deficient in chiaroscuro, into a picture of the tender evening glow, containing broad masses of light and shade, where the valuable is enhanced and the worthless ignored. Compared to gelatino-chloride, it is as a simple melody on the violin is to the metallic precision and stridency of a piano organ grinding out, with variations, the "Ave Maria" from the "Cavalleria Rusticana." Brought into the world between forty and fifty years ago, it failed to please the more utilitarian and less sentimental photographic world that stood around its cradle. Thus it was stifled, but not quite killed, scotched, and not destroyed, to be revived when men and the times were more willing to nourish and encourage it. Is it to be considered the mere ephemeral fancy of a few restless novelty-hunting dilettantists? It can hardly be that. It seems, on the contrary, to be a substantial asset in the property of the earnest worker, a power to be used in all seriousness. It supplies to seekers after a vehicle for their best imaginings something more capable of answering their expectations than any process yet presented to them. Gum bichromate is not the plaything of an hour, but a growing force which will influence the photographic school of the future. There are many who have not the technical ability to draw all they see and all they feel,

and who find that the ordinary methods of photography, while clever enough in one respect, want capacity in the other. Gum bichromate assists such people as these, not only to record their sight, but to register their sentiments.

The influence of gum bichromate upon the method of completing the work commenced in the camera is, and will be, in the direction of supplementing that work by extra-photographic treatment. It will bring to a crisis the much-vexed question which has never been settled, which perhaps, on its merits, never will be settled, that is, the question as to what may, and what may not be, done by extra-photographic methods in producing a print whose genesis is in the camera, which will not deprive the consummation of the name of photograph. When one tries to draw hard-and-fast lines, one is brought face to face with bewildering inconsistencies and anomalies. Retouching a print is held to create a flaw in the title of that print, but retouching a negative does not prevent you from producing an incontestable photograph therefrom. While these two views can be held by the same person, it does not certainly seem easy to settle the matter on a sensible basis. Better far, it seems to me, to give up trying to settle the matter on its merits altogether.

It is not impossible to get the hanging committee of a photographic exhibition to accept a print in which the whole of the sky has been invented, by means of the removal here, and the non-removal there, of pigment from the surface of the paper with a brush. I should have no hesitation myself in submitting such a print for exhibition so long as it was not expressly forbidden by the rules and regulations of that particular exhibition. There is no secret as to the possibilities of gum-bichromate printing, and no concealment of the methods employed in its practice. If my print were accepted, it would imply, not that the committee were deceived, but that they took a broad view, and did not think they would be justified in relegating to obscurity, simply for academic, not to say pedantic, reasons, what was worthy of being hung among prints produced wholly by the action of light. It would be, indeed, lamentable were the few extremists to have their own way, and gum bichromate sent to Coventry, or, as the most vehement would have it, to Jericho; for this reason, that, whatever it may be from the point of view of photography, there is more art in a gum print than in a gelatino-chloride.

Looking at the matter dispassionately, the grumblers must be allowed to "possess a *locus standi* so long as the field of photography is *strictly* limited to what is *purely* photographic. I do not profess to have discovered how they can be persuaded into granting an indefeasible title to such prints as this article directly refers to. One would like to have the opinions of the most ripe experiences and the most matured judgments on the question. That question really is, whether gum bichromate is to be allowed to occupy its present position in photography or to be compelled to secede. Is it to be dubbed an unpleasant name, thrown out from photography and refused admittance to painting, a little more than the one and less than the other?

It seems to me that it should be boldly admitted that the old attempts to define and limit photography to something produced *wholly* by the action of light are quite unsuitable to the necessities of the times. The child has outgrown his garments, and wants a new suit. Photography, indeed, should be made to embrace everything the *genesis of which is in the camera*.

It might be argued in opposition to this suggestion that a photographic print, worked upon with paint almost out of recognition, would find a place in the ranks. Well, it would find its own level. A print which was plastered with paint would be taken for what it was worth, and we might go on our way undisturbed at its effect upon photography. The "survival of the fittest" would operate to eliminate what offended against taste and real art. It does not seem likely, for instance, that any enlargement of the bounds of photography would encourage the worst type of so-called "club portraits."

A confused medley of variously produced prints? There is no reason why a photographic exhibition should be that. It is quite true that the principle which directs the division of water colours from oil paintings at the Royal Academy does not apply here. Still, in effect, no one finds the separation of these two types of brushwork from one another inconvenient or objectionable. Why, then, should not all gum-bichromate prints be hung by themselves in one part of the exhibition room?

At any rate, it would be advisable to place the scope of what is, for convenience, called photography upon a larger footing, instead of narrowing it down to what the strict meaning of the word implies. It cannot be right that such gum-bichromate prints as we saw at the Salon, which are not the outcome of pure photography, and, in the abstract, are not *strictly* entitled to be admitted to an exhibition of pure photography, should be there simply on sufferance. It would not be right, nay, it would be madness, to discourage, or, worse, to cast forth any such fruit of invention, or product of imagination, merely as "anathema destined to destruction." Not by a perpetual running round and round do we progress, but by steadily marching onwards and outwards, fired with a spirit of true liberality, with the instinct of wise toleration, which has for its motto, "Live and Let Live."

HECTOR E. MURCHISON.



### ON THE REMOVAL OF SILVER STAINS FROM GELATINE NEGATIVES.

PERHAPS there is no more dreaded injury throughout the whole course of photographic procedure than that arising from the staining of valuable negatives by reason of having placed the same in contact with one or other of the silver printing papers during damp weather, or by the accidental or unseen attachment of a sheet of printing paper to a negative some portion of which is in a damp condition.

In such cases as where a spot of rain or water has accidentally fallen on the surface of a negative and printing paper has been placed in contact unknowingly, the mischief soon becomes apparent, and by soaking both the negative and the partially printed picture at once in a bath of clean cold water a very little coaxing will suffice to detach the adhering paper from the surface of the negative without injuring the same to any extent. There is, however, a far more insidious source of stains to which negatives are liable, and which arise even in the face of what many may term sufficient precautions being taken to guard against such injury. These stains do not put in an appearance during or for a considerable time after the negative has been in use for printing, and it is only when such negatives happen to be examined some time afterwards that the dreaded brown silver stains become visible. These silver stains have by many expert photographers been considered beyond the possibility of removal, or at least as capable of being removed without at the same time injuring the negative to such an extent as to practically ruin the same; and, judging from the repeated questions that appear in various of our photographic journals, it has come to be looked upon as an injury quite beyond the power of any one rectifying.

For several years I closely studied this matter and spent much time and pains in endeavouring to find a remedy for these stains. I need not trouble the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY with a detailed statement of the numerous experiments that I conducted from time to time; the main point lies, however, in the fact that such experiments have resulted in my succeeding in the attempt; and, as will be seen on perusal of the following lines, even in a surprisingly simple and easy manner.

When I first studied this matter I was forcibly impressed with the difference in appearance which those negatives presented that had been stained for a considerable length of time over those that had only recently contracted the stain. In the former case, such as where a negative has been stained and placed away for several months, this brown stain will in all probability advance to what I term a secondary stage of the trouble, that is the brown colour which first puts in an appearance will become not only more pronounced and get deeper set into the film, but the surface of the stain will assume a peculiar metallic or lustrous appearance quite absent in cases where the stain is of recent contracting.

Of the two kinds of stains the former proved during my experiments by far the more difficult to eradicate, and I soon found out that the treatment which sufficed to remove an ordinary silver stain, that is, in cases where the metallic or lustrous appearance was absent, was quite ineffectual to remove such stains when this additional evil was present, and after several attempts I saw clearly that this metallic appearance was only confined to the surface of the stain, and was in point of fact acting as a waterproof coating, resisting any reducing fluid or solution that was applied to the surface of such.

A little reasoning then induced me to try the effect of removing this metallic lustre by other than chemical means, and so I gave my attention to the application of some mechanical means whereby the thin coating could be removed by friction, and no sooner did I resort to this treatment than I at once became master of the situation and could remove the most pronounced stains with ease without injury to the negative.

Any one who has had experience of this trouble will readily understand that these stains put in an appearance more frequently when gelatine negatives have not been varnished, although a coating of varnish is not an absolute protection against such. Should such stains have to be treated in cases where negatives have been varnished, the first step is to remove the varnish by soaking the negative in strong methylated spirits until the varnish is quite removed. Such films will then be in a condition to be treated to the necessary manipulations which I am about to describe.

In the case of a negative which has contracted this injury the surfaces of which have a metallic appearance, the first step necessary before subjecting the film to the application of any reducing agent is to get rid of the metallic deposit by means of friction, and after several attempts I found I succeeded best by employing some extremely fine pumice powder. It will stand to reason that such powder must contain no lumps or particles that would be liable to cause injury to the surface of the negative or scratch the same to any extent. The sample of pumice powder which I have found most suitable is that used by process-block makers for polishing their zinc slabs, and called by some workers levigated silicate. This powder contains no lumps or coarse particles, and has proved in my hands invaluable for this purpose.

It stands to reason that, when it is applied to the surface of the negative at those parts where the stain is located, it should only be rubbed over the stains alone, and with a gentle touch working in a circular movement with the point of the finger. It will be seen that

only a slight friction is needed at this stage, for the aim is not to remove entirely the silver stain by its means, but merely to cause the metallic coating to disappear so as to permit of the action of the reducing solution which is afterwards to be applied.

The application of pumice powder in this work is, however, quite within the bounds of practicability, and any one can rub the surface of a stain without in any way injuring the negative.

When once it is seen that the metallic appearance has disappeared, the remaining treatment consists of the exercise of a little patience, no skill being required, for all that remains to accomplish is simply soaking the negative in the necessary solution until the stain has disappeared or at least so far reduced as to become of no practical detriment to the negative.

In cases where negatives have contracted these stains, and they are not of long standing, the application of rubbing is not required, and a few minutes' soaking or immersion in the reducing solution will cause their removal as if by magic.

On the other hand, there is a class of stains that may have been present in a negative for a long time, even years, and which, though being well stored, never appear with the metallic deposit on the surface, but have the stain deep down into the film, and negatives taken on thick film are more troublesome to deal with than thin ones, although as yet I have never met with a case beyond the possibility of yielding to the treatment I am describing. It is only a matter of time; stains of recent contracting may yield to the treatment in five or ten minutes' time, whilst those of long standing may require several hours before the stains will disappear.

In the course of my experiments in this matter I naturally reasoned in my own mind as to what these stains consisted of, and was driven to the conclusion that a stain which had not contracted a metallic lustre consisted more or less of chloride of silver, and so I proceeded, first of all, to produce a negative with the stains by placing in contact sensitive paper and a damp film. In three days I had a plentiful crop of the evil, and then I waited a few days longer, during which time I repeatedly watched the progress of the stains by means of a microscope, using a good quarter-inch objective.

The outcome of these experiments prompted me to try the power of our good old friend hypo as a reducing agent, and to my great satisfaction, after immersing the negative with the stains that I had purposely caused to appear, the stains disappeared, as by magic, in less than ten minutes.

Encouraged by the success of this experiment, I immediately looked out some negatives that had been stained for years, and also solicited several from my friends; in every instance the results were successful where no metallic coating of the stain was present. I then set myself to reason out the necessary treatment of negatives having this defect, and, by removing the same with friction as described, and eventually immersing the negatives in freshly mixed hypo, in the proportion of three parts of a saturated solution to one of water, I invariably succeeded in getting rid of the stains; but, as I have said, it takes a much longer time in the hypo to remove deep-seated stains than those of recent contracting. I feel sure that any readers of THE BRITISH JOURNAL OF PHOTOGRAPHY who carefully apply the treatment will find these dreaded visitors more easily got rid of than has hitherto been deemed possible; but it should be borne in mind that the sooner a negative is treated after it has contracted these stains the better, five or ten minutes in the hypo will then remove them.

A. T. NEWTON.

### ON THE MEANING OF THE PHRASE "EQUIVALENT" AS APPLIED TO LENSES.

IN 1840 the mathematician Gauss discovered that the position and magnification of the image formed when an object is situated on the common axis of any system of refracting surfaces, including lenses of any thickness, depend only on the positions of four fixed points on the axis. These points are the foci,  $F, F'$ , of beams parallel to the axis, incident on either end of the system of lenses, and  $H, H'$ , the two conjugate foci at which object and image are of the same dimensions, and both erect; in the case of any ordinary lens this object and image will be found to be formed by virtual pencils. The points,  $F, F'$ , are easily found by examining the position of a distant object; one of them, in fact, is the point on the ground glass of a camera at which a distant axial body is clearly focussed. The other points,  $H, H'$ , are inside the lens, but their distances from the foci can be found, not approximately, but absolutely, by a simple practical process, or it may be expressed mathematically in terms of the focal lengths of the various lenses and their distances apart.

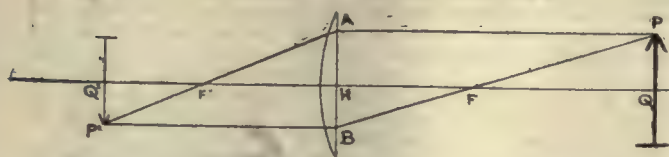
The ordinary formula for connecting the positions of conjugate foci becomes simplified if their distances from  $F, F'$  respectively are measured: it is, if  $HF$  which is the same as  $H'F'$  is called  $f$ , and these distances respectively are called  $x, x'$ , simply  $xx' = f^2$ .

Before proving this, and another simple formula for the magnification, I shall first examine the positions of the four points in the case of a simple lens, regarded as very thin; next I shall show how the posi-



tion and magnitude of an image are obtained when these points are given in the more general case; and, lastly, I shall examine what the phrase "equivalent lens" may be taken to mean.

Fig 1



In the case of a thin lens (fig. 1), the foci need no definition, and the principal planes (i.e., the planes through the points of unit magnification and perpendicular to the axis) coincide with the lens, for clearly an object close up to the lens appears just as it is. Thus the points H, H' merge into one H; and if AHB be the lens, PQ, P'Q' object and image, we may ascertain the position of P from that of P' by considering where any two rays from P intersect after refraction, for clearly this will be the point to which all the rays from P converge. The two particular rays usually chosen are that through H, the centre of the lens, which is not refracted at all, and that parallel to the axis. But, for the present purpose, it is better to select the ray PA, parallel to the axis, and PB, that ray PB that passes through F. Let  $FQ = x$ ,  $F'Q' = x'$ ,  $HF = HF' = f$ , then the magnification is the ratio of P'Q' to PQ.

$$\text{Now } \frac{P'Q'}{PQ} = \frac{BH}{FQ} = \frac{HF}{FQ} = \frac{f}{x}$$

$$\text{and also } = \frac{P'Q'}{AH} = \frac{F'Q'}{HF'} = \frac{x'}{f}$$

by the properties of the pairs of similar triangles FPQ, FHB, and F'AH, F'P'Q'.

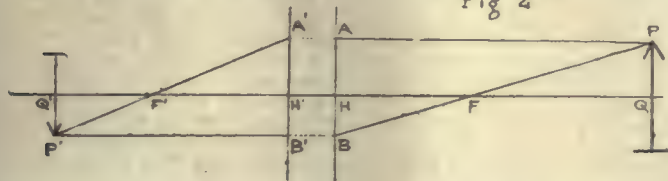
Hence we have

$$\text{Magnification} = \frac{f}{x} = \frac{x'}{f}$$

$$\text{and } xx' = f^2.$$

In any compound lens we can prove (but the mathematical work though elementary is long) that  $HF = HF'$ , and by analogy we shall call this length  $f$ . On referring to fig. 2, where the lenses are not inserted, it will be seen that the reasoning is identical in character. We know that, whatever the course of the rays between the planes through HH', a ray through A on the plane AH will emerge at A' on the plane A'H' where AA' is parallel to HH', for objects in the one principal plane have equal images in the other, by the definition above.

Fig 2



Also the particular ray from P, parallel to the axis, must, after refraction, pass through F'; hence PA emerges in the direction A'P'. What it does between A, A' depends on the internal constitution of the system of lenses, and not on H, H', F or F'. Again, the ray, PFB, must, after refraction, emerge in the direction of B'P'; hence P' is the focus conjugate to P. By the same reasoning as in the previous case we have—

$$\text{Magnification} = \frac{f}{x} = \frac{x'}{f},$$

$$\text{and } xx' = f^2.$$

It is clear that, if two lenses of the same focal length,  $f$ , one a single lens (fig. 1) and the other a combination (fig. 2) be taken, the images of equal objects (PQ), at equal distances ( $x$ ) from the front foci (F), will be of equal magnitudes (P'Q') in each case, but, on account of the interval, HH', in the second case, will be different distances (QQ') from the objects. Again since in any doublet HH' cannot coincide, no single lens can possibly be equivalent to a doublet in the sense of producing an image of any given object, identical in magnitude and position, with that produced by the doublet.

But it is easy to see where a single thin lens must be placed in order to produce the same image as the doublet for any particular position of the object, for, on joining PP' (fig. 2), its intersection with HH' will give the position of the necessary single lens, while its focus can be calculated from the conjugate foci, P, P'.

If we call HH',  $b$ , it can be shown, without much calculation, that the distance of this single thin lens from H' is  $\frac{bf}{f+b}$ , and its focal length

$f(1 + \frac{b}{x+x'+2f})$ . These results indicate very clearly that both the position and focus of the thin lens equivalent to a combination of lenses must vary with the position of the object. The extreme cases are when Q is very near or very far from F. Supposing the object to be moved from F outwards, the equivalent thin lens will be at H when Q is at F, i.e., when  $x=0$ , and move nearer and nearer H' as Q moves off to an infinite distance. Its focal length will be  $f$  when Q is either at F or at an indefinite distance, and departs from this value to the greatest extent when  $x$  is equal to  $f$ . In this case  $x'$  also =  $f$ , and the focal length is  $f + \frac{1}{2}b$ . It must be noted that in an ordinary doublet lens  $b$  is small and negative; so the equivalent thin lens has a minimum focal length in this case.

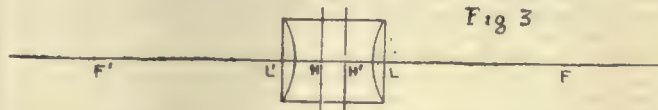
It will be observed that, when  $x=f=x'$ , the magnification is unity, as is well known, but the image is reversed, a very important distinction.

From the preceding results several important conclusions can be drawn and summarised thus:—

1. Two systems of lenses are strictly equivalent if for all positions of the object, and of the image formed by one, the other can be so placed as to give an image identical in position and magnitude.
2. For this to be the case it is necessary that the four cardinal points, F'H'HF, should be situated at exactly the same distances for the two systems of lenses.
3. Since these points only involve two quantities, namely, F'H', which is equal to HF, and H'H, and a doublet involves three quantities, namely, the focal lengths and separation between its elements, regarded as thin lenses, there must be some latitude in the choice of these three quantities.
4. Hence a symmetrical doublet, but only one, can be found exactly equivalent to a given system of lenses. It may be noted that this combination will be less separated than any equivalent doublet.
5. No thin lens is equivalent to a doublet in the strict sense; but, for any particular position and relative magnitude of object and image, a single lens can be found that can replace the doublet for this particular case only.
6. For distant objects (e.g., in landscape work) this thin lens is practically fixed in position and focal length, and may therefore be loosely called the equivalent thin lens. Its position is at H', and its focal length is  $f$ .
7. A single thick symmetrical lens equivalent to any combination can always be found.

For those who care for exact formulae, I have gathered a few here. Let there be a doublet consisting of two thin lenses, focal lengths,  $f_1, f_2$ ,

Fig 3



separated by an interval,  $a$ . Then, if LL' are these lenses (fig. 3), we shall find—

$$LF = \frac{f_1(f_2 - a)}{f_1 + f_2 - a}, \quad L'F' = \frac{f_2(f_1 - a)}{f_1 + f_2 - a},$$

$$LH = \frac{af_1}{f_1 + f_2 - a}, \quad L'H' = \frac{af_2}{f_1 + f_2 - a},$$

(whence H is to the left of H', and  $b$  must be reckoned negative, as remarked before, in fact,  $b = \frac{-a^2}{f_1 + f_2 - a}$ ),

$$\text{and } HF = HF' = \frac{f_1 f_2}{f_1 + f_2 - a} = f \text{ (say).}$$

If  $F_1, F_2, A$  are the corresponding quantities for any equivalent lens of the same kind, we have at once from the equality of  $f$  and  $b$  in each case:—

$$\frac{f_1 f_2}{f_1 + f_2 - a} = \frac{F_1 F_2}{F_1 + F_2 - A},$$

$$\frac{-a^2}{f_1 + f_2 - a} = \frac{-A^2}{F_1 + F_2 - A},$$

whence, in a simpler form,

$$\frac{f_1 f_2}{a^2} = \frac{F_1 F_2}{A^2},$$

$$\frac{f_1 + f_2 - a}{a^2} = \frac{F_1 + F_2 - A}{A^2}.$$

It is easier, however, to find HH'F'F' practically, and the result has the merit of being independent of any assumption as to the constituent lenses being thin. The formula could, of course, be corrected for this, but would be very lengthy. The practical method is as follows:—

Mount the combined lens under examination and find the focus for distant objects, first viewed from one end, then from the other; this



gives the positions of F and F'; next find the positions of any two conjugate foci, Q'Q'; then, measuring FQ (x) and F'Q' (x'), we have  $xx'$ ; but this is  $f^2$ , or  $FH^2$ , or  $F'H^2$ , so that the positions of all four cardinal points can be plotted on a diagram and kept for reference.

PROFESSOR J. E. A. STEGALL.

### VANISHING ENGLAND; AND A SUGGESTION.

IN a recent issue of THE BRITISH JOURNAL OF PHOTOGRAPHY attention was called to "vanishing London," and success heartily wished to the efforts of Sir Benjamin Stone and others in preserving photographic records of what, in the way of old streets, bridges, &c., must soon, in the effort at accommodating increasing traffic, become things of the past. With equal truth, and as of greater general interest, attention might be directed more broadly to vanishing England, and something of systematic effort made towards similarly forming photographic records of many interesting types of buildings gradually being evolved by the stress of bricker civilisation out of existence. There is hardly a corner in the British Isles that has not something distinctive and peculiar in such a direction. Such need not necessarily be artistic; possibly, indeed, in many cases it may prove matter for congratulation that they can be regarded as disappearing; still they are, from a variety of causes, interesting. The picture of a crofter's house, for instance, would prove a great aid in understanding his position and woes; one of an Irish shebeen of value in realising the difficulties of settling Irish questions by Anglo-Saxon methods; or, as introducing a desirable and pleasanter, if not essential, artistic touch, there is the "black and white" house of the north country, more particularly perhaps of Cheshire, and most so of that country's interesting heart, the city of Chester. The genuine "black and white" house will before long have gone; imitations there are continually being built, but, apart from evidently lacking the charm of age, they are but bastard productions, conditioned to a newer order of things not obtaining in the times of the original ancient builders. What of old inns again, churches, market halls, and a wealth of others too great for anything like individual mention and notice? There is something extremely pleasing and valuable in these old buildings, apart from all artistic consideration, in that they must be faithful reflections of the character and ideas of the builders and the times they lived in, and the associations, sometimes rising to the dignity of history, connected with them. Why a "black and white" exterior? Why overhanging stories, latticed windows, and diamond panes? Or, treating the combined units as forming streets and towns, why should the former be so irregular and twisted in their course, the latter so crushed-up in character? Was it a question of warding off and breaking up the force of cold winds, and keeping all within the necessary protection of the ancient wall, or what? Questions interesting in a remarkable degree to one looking beneath the immediate surface, but which will soon have to be studied without the actualities to refer to, as these are being rapidly cleared away. Ancient houses do not meet modern ideas of comfort and hygiene, inns become hotels, churches are "restored," and market halls are not only sadly in the way in main streets, but absurdly inadequate to the needs of present-day trading. Cobbled streets are too trying for modern traffic and modern nerves irritably intolerant of rattle and noise; corporate effort is ever persistently directed towards straightening out and broadening; overhanging stories shut off too much light, and picturesque courts and closes are swept off as insanitary. Here, surely, is the chance for photography as an ideal recording means.

Beyond typical buildings and their particular arrangements, many types of English workers are also quietly vanishing. The changes are so gradual that we are not conscious of them, and the individuals becoming extinct are such familiar ones that we hardly regard them as worth preserving. A little more time and progress, and our estimate of value and interest will rise, probably too late to gain characteristic pictures. Looking back a little, how glad would we not be to have pictures as reliable as photographs of the chairmen, linkboys, hackney coachmen, bagmen, beadles, town criers, watchmen, and so on, who figured in the social life of the early part of the century. Applying the conclusion to present-day types of workers, we should endeavour to gain fairest and fullest records of them. The whole of a town, for instance, will soon be lighted at the shifting of a switch in a central lighting station, and the familiar figure of the lamp-lighter moving briskly along, carrying his little lamp at the end of a long pole, leaving a cheerful trail of light in his wake, will have moved out of the workaday world altogether, taking the gas lamp with him. To us the picture of either, or both, would not at present be particularly attractive, but in a few years' time they will have become so, both as a reminder of past times and a something definite and tangible to measure progress by. In proof of which, let it be asked if we now would not be glad to have photographs of the old oil lamp and its lighter. But, if it be thought too early yet to start upon a record of such present-day worthies as lamp-lighters, cabmen, omnibus-drivers, farm labourers in smock frocks, kilied Highlanders, top-hatted Welshwomen, and a host of others more or less rapidly travelling onward on the vanishing track, there is plenty left. The many quaint observances and ceremonies, for instance, in various parts of the country—May-day processions, Jack-in-the-greens,

Guy Fawkes celebrations, hiring fairs, and so on—that, as liable to be snapped up at any moment, ought to be carefully recorded in photographs. To take one from the first-mentioned class, reference may be made to surely the brightest and most pleasing of them all, the observance of May Day at Knutsford in Cheshire. Here the old English custom is kept up to the full, and the procession escorting the May Queen to her crowning place at the Maypole on the heath, is charming in the extreme. On a sunny day, wending its way, headed by morrice dancers, through the quaint lower town, it is as true and lovely a splash of mediæval colour, a scrap of old English pageant, as can be well conceived of. It is well worth recording, in common with many others, for they cannot long stand the pressure of the keen utilitarian struggle of to-day, with its maximum of work and minimum of play.

Many of the foregoing have, of course, been photographed, mainly by amateurs, but the range of the finished work is local, and, like the local prophet, not as highly thought of as it should be in its own country. The illustrated paper and magazine, it is true, diffuse them more widely at times; but there is a world of difference between a photograph and the newspaper print reproduced from it. The financial side of a paper, too, must be held in first regard, and the consequent more paying appeal to the greatest number does not by any means make for artistic righteousness and interest on the higher planes.

As more to the latter purpose, the suggestion is offered that a society be formed, recruited as widely as possible, for the photographic preservation of what is slipping away. A vast number of amateur photographers, men of high intelligence, culture, and artistic tastes, must already have in their possession negatives of great value to this end, which they would be ready to lend for careful printing from. They would be as ready to become members of a society formed to gain similar prints of places, people, and events beyond the range of personal working. Could not this high array of photographic, and otherwise general, talent be formed into a united something in the way of society or association for the systematic taking and distribution of vanishing items of interest, such as those above referred to? The professional worker would be only too willingly welcomed if he cared to join in, for his presence would immensely strengthen matters. But, as he could not expect pay on the full professional scale for any work done, and his particular hobbies, like those of the rest of us, run probably in other directions than bread-and-cheese grooves, he could hardly be expected to find as much inducement to join as his amateur brother. Many artists, readers, and folk-lorists generally, outside the photographic ranks, would, doubtless, be also glad to have so many well-finished prints in return for a yearly subscription.

It would be premature, in such a crude first suggestion as this, to enter into any elaborate details of construction and administration, they could be readily drawn up at need upon a workable basis by a few experienced technical workers and business men. To pass the matter on a stage, however, it might be suggested that members pay a subscription into a central fund, to be spent, at the discretion of a small working committee, in selecting suitable existing negatives, arranging for the taking of particular objects determined upon, and the final printing and distribution of the finished results. The individual member would thus have a certain number of photographic pictures monthly, or three-monthly, in return for his subscription, graduated in number, if you will, according to the value of a subscription varying in amount. His own work would be paid for in money or kind, not, admittedly, to its full value, but the higher standards by which the pleasure of intelligent hobbies is measured are not money ones in the photographic, more than the general, world.

If so far successful, in this age of cheap production and specialised publications, a supplementing of pictures with descriptive letterpress, and articles bearing generally upon the subject, might in due course be entertained and ventured upon. In this way might easily be attained the general lifting and spread of knowledge of the particular subject, the glorification of the photographic means, and the preservation in many cases of objects of high value that, lacking a little aid, are oftentimes allowed to fall to ruin, or, lacking a little intelligent interest, unnecessarily "improved" away.

JOHN REES.

### PICTURESQUE BITS: WHERE TO FIND THEM.

I KNOW too much about exhibitions to put great faith in the value of them as standards held up to show the rank and file that here is true art, and, as for the medalled, to take it for granted that here is the ideal photography; but, however that may be, we see in exhibitions a reflex of what is being done, or attempted, in this art of ours all over the world. I have seen it stated somewhere that thousands of these high-art and poetic productions were made in the earlier years, and washed off the plates as unutterable and disgusting failures. That is true, no doubt, in a sense, for the bulk of the more advanced (in photographic years) of us were trained to consider the "perfectly sharp" as the ideal; sometimes we got atmosphere, and the result was then a marvel. I do not think, after all, that it was a bad school to be trained in, that of pure photography, chemical and literal. When, at length, a very few started on a newer tack, and produced and showed photographs distinctly diffused—I



need only instance those of Mr. Galloway, shown at the earlier of the Newcastle series of exhibitions—the effect produced had in it more of tolerance than admiration, and yet Mr. G.'s productions were undeniably good, and were pictures. Where the most of us made the mistake, and do still, was in taking too much on one plate, a print measuring 8×6 might have upon it the elements of half a dozen pictures, but the rule was detail and plenty of it, and the results usually were topographical.

It is not necessary here to trace the evolution of the more modern fuzzy production. I don't think Amidol junior was deliberately fooling when he took his new 30s. half-plate set into the fields in search of the picturesque; true, his lens was only a periscopic, and his plate was upside down; but, being a new hand, we cannot blame him for that. He was also unaware that a little daylight was oozing through the camera front (which accounted for the striking sunlight effect), but the result achieved exceeded all anticipations, was pronounced to be so perfect by the Amidol family, all of whom are addicted to poetry, and therefore of "those who see visions and dream dreams," the indefinitely weird mistiness, that marvellous effect of sunlight, proved beyond doubt the birth of the ideal photography. It is common history, of course, that our hero completely failed to reproduce quite the same effect in his after-wanderings, though the sunlight effect aforesaid long haunted him almost to lunacy. I think we must agree, all things considered, that there was no deliberate fooling, but the discovery of the fuzzy was a pure accident, and took some clever men several years of hard work to perfect.

If there is any special demand for the diffusive—and our exhibitions of recent years rather favour the idea that there is—I think readers will find, some of them that is, in this article a method of procedure which will yield, without undue exertion, something of the nature required.

After a few years of itinerant photography, a period, be it longer or shorter, in which the worker may have accumulated some hundreds of negatives, the picturesque may be in the bulk far from asserting itself, and to discover it we have to make search and selections; it will have to be sought for, and isolated from, its more commonplace surroundings—"Full many a flower is born to blush unseen," &c.

These lines of the immortal Gray rise naturally to our lips when we find, as we often may do, a gem of a picture hidden away in a mass of detail on some long-forgotten plate. When I invite the reader, therefore, to join in a search for the picturesque, it is not intended to go far afield, but to pick the "gems" out of the plates already exposed; the chances are that we have already in our plate boxes a very sufficient crop of "picturesque bits" which only needs harvesting—an operation which will pleasantly fill up many a long winter evening.

The idea has been to look through some boxes of negatives and select certain of them, or certain parts of them, for enlargement in the manner following:—

Many negatives are stored away and remain practically unused mainly because they are difficult printers, vaguely unsatisfactory in some point or other, not bad enough to quite discard, put away for further possible treatment perhaps. We must all have experiences of the kind, though by the way we need not confine ourselves to all the faulty or less perfect negatives. During one holiday season I exposed over a gross of films. Incidentally I may remark that with a roll-holder in proper working order, and with due care as regards light and exposure, there need not be five per cent. of failures; but roll-holders have not (as I can testify from painful and costly experience), always been faultless, and, of course, errors from other causes are always liable to creep in; however, the net results were not bad from that trip; amongst the remainder were some doubtful ones; you expose on a subject that takes the eye, and the result is not quite what you expect, it takes years of practical work with the hand camera to adequately comprehend its limitations, and one is being constantly tempted to expose where one's better and cooler judgment would pass the view by. Occasionally, as I have found, and as others may find, in aiming high you may be sure to hit something; thus it is that "some parts" of these doubtful films or plates may be, as the curate said of his "box" egg, *very good!* It is possible in this way to pick out many pleasing "bits," a tree, boat or sailing vessel, group or what not primarily only a part of what was aimed at; but now the "reason of the existence" of the plate. Lots of negatives may be failures in the bulk, but details may often be picked out which should save them from destruction; look through them and most likely we shall be able to find plenty of material to work upon. More particularly on account of its convenience, and under certain conditions, certainly the lantern will be the best medium for the enlarging operations; the subjects to be treated will be mostly on the small scale, the enlargement need not exceed twelve inches or so in height, and the subject can therefore be brought nicely within the circle of a four-inch condenser. The circular shape is in itself often available, while masks should be cut in a variety of shapes, fan, palette, and such other designs as may commend themselves.

Now, each operator may please himself as to mode of working; the plain bromide enlargement direct from the negative is, of course, the simplest method; here, however, we must suppose that a really good negative or "bit" is to be operated upon, and in such a case we may interpose a mask of any desired shape, and get our picture direct. This is not what I am designing at all; we want rather a method which shall call into use more of the personal element, and exercise all the skill and

artistic sense we may be capable of. There are advantages and possibilities in this direction, if we make larger negatives, which may be worked upon and improved, and from which prints can be produced in various ways and in a variety of colours (as in carbon), and which, moreover, may be designed to give any amount of diffusion, if that be a *sine-quâ-non*. Briefly put, I make enlarged paper negatives, which, after being worked up, improved, as far as possible, by retouching, are waxed and printed from. Paper negatives may be made as fine in detail and grain almost as dry plates; they are eminently suited for prints on smooth or rough bromide papers, carbon, or platinotype, or gum bichromate. Owing to the surface, they take before waxing a pencil mark easily, and cloud effects may be readily worked in by the exercise of some skill and patience, and scarcely one but can be improved to some extent.

Our lantern will require a little attention. Having been put away clean and empty, all we need do to it is to put in new wicks and fresh oil. The principal point about oil lanterns is *cleanliness*: fresh oil (of the best quality), with a small proportion of camphor added, and clean carefully trimmed wicks. For the purely enlarging work the main points are, to get rid of the flame spot or shadow, which may be done by coating one face of the condenser with fine matt varnish, or by inserting between the glasses forming that lens a disc of new and white mineral paper; and, secondly, to fit the front lens, which, in all the usual lanterns, will be achromatic, with one or two diaphragms or stops. The simplest way to do this is to cut a disc of black cardboard, make a central hole of three-quarters of an inch diameter, and place between the lenses; it may be held in place by a couple of folds of thin cardboard inserted one in front and one behind the disc; these folds of cardboard, if not too thick, will fold close up to the jacket or tube of lens. The definition of the picture will be improved by the use of the diaphragm, but, of course, the exposure must be increased *pro rata*.

The next thing is to provide a simple camera arrangement (having a focus screen and plate-holder at one end), into which to thrust the lens and project the enlarged image. A somewhat similar apparatus to that commonly used for making slides by reduction is most convenient, and is formed of framework with carriers at one end over which, during the operations, the focussing cloth is thrown. We get practically the same thing, and, what is of importance, a little more *weight*, by selecting a box or case about 2 feet long by 1½ broad and deep; fit in one end of this an aperture and flange to carry a 12×10 printing frame, or larger, and at the other end make a round hole, through which to put the lens. Now, if we remove the top and one side—that side, by the way, on which the operator will find it most convenient to work—we may insert a half-inch curtain rod at the vacant corners and throw a cloth over to cover the top and side, a neat arrangement is made which will serve all purposes. The printing frame is made to fit closely and is buttoned up; a focussing screen of finely ground glass should be made (using matt varnish) or bought, as enlargements intended for negatives should be finely focussed by transmitted as well as by reflected light. As the degree of enlargement may not greatly vary, the apparatus need not be over-bulky or inconvenient to handle; indeed, the whole of the arrangements need only occupy a small table. The use of a screened space is recommended, as every care should be used to secure images free from fog, more care, as a matter of fact, being necessary in the making of negatives than if we were doing plain bromide enlargements. In focussing also it is well to examine the image both by reflected light, as on a piece (12×10) of stiff white board put into the frame, as well as by looking at it through a square (12×10) of ground glass, also put into the frame for the purpose, in order to try to get as sharp a picture as possible; no doubt it will be pleasantly and sufficiently diffused by the time the operations are completed. In the event of a mask being used—and I find it always an advantage to have a clean, sharply defined edge—it should be inserted in the frame immediately in front of the sensitive surface. This completes, I think, the list of our mechanical requirements.

The manipulations being so much like the usual thing to which operators are accustomed, it will be necessary only to touch upon each detail in the order it is reached. We begin with the *transparency*. This, having marked out the "bit" to be enlarged, we make by contact, using an ordinary lantern plate. The exposure should be timed so that we get full detail and not too great density. We want a good enlarging colour, and *brown* is a good colour to aim at, as clean and perfect an image as possible, but fully soft. The picture will be, as a rule, printed out direct. In a few cases a vignette may be made of such subjects as lend themselves to such a method of work. We are guided mainly by what we wish the resulting print to be like, and try to make things easier for the printing stage. Any special gift we may possess in the way of selection of subject, balance, perspective, and form will be brought out in the process.

With regard to bromide papers, it is not a meaningless phrase to say that all are good, and, if for the present purpose I mention the products of the Elstree firm, it is because these remarks have been written after some full experience of their special adaptation, not only for negative making, but for the finished pictures.

With the special negative paper, a fully exposed negative image is got in from twenty to thirty seconds. The developer is strictly according to directions, viz., amidol; but it is well always to expose a trial strip of



paper, placed diagonally, to take in a fair sample of the lights and shades of the subject, and to develop this out fully and fix before proceeding to the actual enlargement. The operations are simple, but the following points are essential: plenty of room and light, a good supply of developer, water supply, dishes, and so on. The lantern has already been referred to. During development we may make use of a fair amount of canary yellow light, but naturally use all ordinary precautions to prevent undue exposure to stray and reflected rays of light, as from the lantern body.

The exposure will be correct if we can, within the limits of a few minutes, and without undue forcing, get full density; allow something for loss in the fixing bath, and also for the use of a final clearing bath; this is important, for the intensification of paper negatives or positives is not an operation to be taken on lightly. The developer is appended:—

Water .....	20 ounces,
Sulphite of soda .....	650 grains,
Bromide potass .....	10
Amidol .....	50

Mixed in the order named and used within a week. The amateur of limited surroundings, the "sentry-box amateur," may comfort himself with the assurance that the above solution is pre-eminently a safe one, that a trace of hypo, should any by chance get in, does not mean ruin to the print; but mind this, it must be only a trace. Neither is an acid bath necessary—the developed negative is plunged at once into the fixing bath. The procedure is as follows: Expose the paper dry; then, after exposure, remove to a dish of water to soften, and see that (handling only by one corner) the sensitive surface is free of air bells; now remove and drain for a few seconds, and place in the dish containing a sufficiency of developer; handle carefully, and turn over to avoid any collection of air bells; if correctly exposed, the image will begin to appear in a few seconds; when sufficiently developed, remove and place in the fixing bath (hypo, 4 ounces, water to 1 pint), moving about occasionally during ten minutes; the paper should be handled only by means of "clips" to avoid finger marks and stains. The image should not appear too quickly; on the other hand, "tardy development" will almost certainly prove fatal, because the negative is sure to be too hard and coarse for our purpose. The enlarged negative should, and will invariably, be better than the original—stronger perhaps, and yet soft enough to give capital prints; when dry, it will be ready for flattening out by placing between clean blotting-paper and under a weight, then retouching, making such improvements as we are able by means of a carbon pencil (special bromide retouching). It is surprising how skilful some amateurs become in work of this kind, putting in cloud and light effects in soft printing negatives.

Waxing the paper negative is not an absolute necessity, but it is better and a decided improvement. An easy way to do this is to provide a shallow tin tray, a little larger all round than the paper; place the paper negative (it must be quite dry) in this, and on the top of it a few pieces of clean paraffin wax. Now place the tray in front of a good clear fire, or in the oven, not too hot, and, when the wax is melted, the paper will be found very completely saturated, and may be lifted out and quickly drained before the fire. If now the waxed negative is placed between folds of white blotting-paper of the non-stuffy variety, and a hot iron passed over, the result will be very satisfactory. The negative is ready for printing from at once.

An easy way of flattening the negatives, whether for waxing or not, is to—after washing and drying—once more wet and squeegee face down to a vulcanite or ferrotype support.

I have referred to the Wellington negative paper so far because certain results have been achieved with it. The rolls of six-and-a-half-inch width are very suitable, negatives of  $6\frac{1}{2} \times 12$  and so on make a capital size and shape to work with; or, of course, one can use the cut pieces  $10 \times 8$  or  $12 \times 10$ . The remainder of the operations, if bromide prints are intended, are so similar to what has gone before, except, of course, the exposure by contact, that further reference to them is superfluous, while other printing processes, as carbon and gum bichromate, for which such negatives are specially adapted, are beyond the scope of this present article.

J. PIKE.

### SILHOUETTE PHOTOGRAPHS.

THERE is considerable value in a well-made portrait à la silhouette, say<sup>6</sup> an American contemporary, provided its profile limitations are applied to the preservation of a good type. Poise, proportion and individuality of features, characteristic carriage and striking habits in dress may be most effectively presented, and, before the days of Daguerre, silhouettes were very largely in demand and very highly prized.

As an artistic adaptation of the silhouette may be mentioned a recent portrait of a great musician, a combination showing the entire figure of the pianist in silhouette, while the piano at which he is seated, and a few lines indicating the character of the surroundings, are sketched in artistically, thus demonstrating a possibility in the use of silhouette drawing that is decidedly attractive.

The production of silhouette pictures is as old as mythology. The first silhouette was the charcoal outline of his shadow on the fire-lit wall,

made by a Greek maiden when her lover left for the wars. The name silhouette is said to have been originally a term of contempt, signifying penuriousness, and applied to shadow pictures as the "poor relation" of art and photography. Some of the old silhouette workers were wonderfully clever, and their work far from a reproach.

The scissors are, however, now superseded by the camera, and even intricate silhouettes may be produced without a great deal of difficulty.

There are worse things than a case full of silhouettes with which to attract the attention of patrons. The silhouette, devoid of accessory, makes a very direct and forceful appeal, and a good silhouette is often an unmistakable and characteristic likeness.

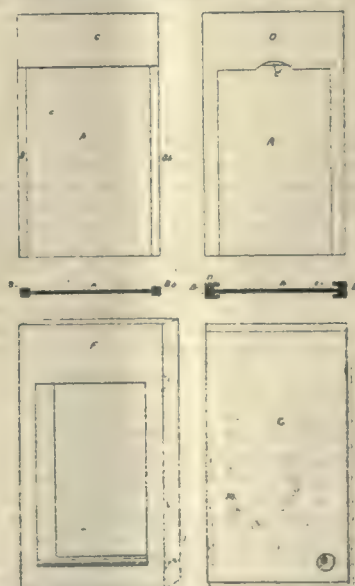
For taking silhouette pictures an ordinary room is, perhaps, preferable to a studio, in that all the light may come from behind the sitter. Choose, if possible, a north light. In front of the window hang a thin white cloth, to soften the light. This should be hung some little distance from the window frame, so that no trace of shadow may fall upon it. It must be free from creases—fastened to rods top and bottom—to give an absolute flat light. In front of this screen place the sitter. All the light is thus arranged behind the object, supposing a room with a single window to have been chosen. There will be no difficulty as to how the picture will look, for the image on the ground glass will be a sharp and distinct silhouette. A thickly coated and very slow plate should be used, with development for absolute density, and clear glass, and the negative should afterwards be intensified. The best developer is pyro soda, with a fair amount of sulphite. If needful, retouching is easily done with a fine brush dipped in opaque pigment.

For printing, a matt surface paper is desirable. The silhouettes can, if preferred, be cut out and pasted on to a card, in exact imitation of the old style, or they may be printed on a sheet of paper giving ample margin. Generally, they look best unmounted, or mounted on a card, to give stiffness without a margin of card being shown.

Children are often very well rendered by silhouette, and a child may easily be taken full length. For this a table should be placed before the window, at such a height that the top cuts the light. On this the child may be posed in profile standing or sitting. With a little thought and experimenting, many delightful poses may be evolved. The camera, in the case of a full-length, should be placed with the lens at exactly the same height as the top of the table. If the lens were higher, the feet would, of course, be lost in the black mass of the table and the effect would be destroyed. Before printing, a strip of paper may be pasted across the table, reducing the ground to a narrow strip.

### BETHELL'S DARK SLIDE.

ACCORDING to Mr. Bethell's description of his invention, the plate-holder for a double dark slide is made by fixing on each side of a piece of cardboard, or other suitable material, A, narrow slips of cardboard, B, B b, parallel to each other, about the same thickness as an ordinary photographic dry plate, leaving sufficient space between B and B b, on each side of A, to accommodate the dry plates.



At right angles and across one end of B, B b a piece of cardboard, C, of the same substance as B, B b, is fixed on each side of A.

"Over B, B b, and C, I place a piece of cardboard or other suitable material, D, out of which a slightly smaller aperture has been cut than the space formed by B, B b, and C when in position. A thumb-hole is



provided in D, to facilitate the removal of the plate; this arrangement, when the several parts are suitably secured, forms a rabbet or groove, E and E', on each side of A, into which the dry plate may slide and be held firmly. The top of the plate-holder is covered with a suitable fabric to exclude the light when the plate-holder is in the sheath, F.

The sheath, F, consists of a case made preferably of cardboard, covered with a suitable material, with an aperture cut from each of its sides to correspond with the aperture in the plate-holder. The bottom of the sheath is closed, preferably with a piece of wood the full width of the



plate-holder and the required depth, with a rabbet on each side, leaving a space in the centre sufficient to engage the two dry plates and cardboard, A, of the plate-holder; this arrangement provides for the shutter, G, to go below the bottom edge of the aperture of the sheath and effectually excludes light when the shutter is closed.

The shutters, G, fit between the two outer surfaces of the plate-holder and the inside of the sheath, so that, when the plate-holder, with a shutter on each side, is inserted in a sheath, two consecutive exposures may be made by first drawing up the required shutter, then replacing it, withdrawing the whole of the dark slide, turning it round, and repeating the operation.

The shutters, G, may be made of either metal or cardboard, or a combination of metal and cardboard or other suitable material. They may be of one rectangular piece of material, or, if cardboard is used, it may be creased at H in such a manner and position that, when drawn up at the time of making the exposure, the upper portion of G may be turned down at right angles with the lower portion, G, G'.

The upper and lower portion of shutters, G and G', may be suitably covered with metal, leaving the creasing in the cardboard uncovered, allowing the shutter to be turned down as described above.

The shutters, G, may also consist of a piece of cardboard creased at H, with additional pieces of cardboard or metal suitably attached to the upper and lower portion, the upper portion being so attached that, when the shutter is drawn up and turned down at right angles with the lower portion, the portion, J, may project over the top portion of the dark slide, and, if depressed when at right angles, may form a protection against light entering and spoiling the plate during a prolonged exposure."

#### HAAS' METHOD OF GRAINING PHOTOGRAPHIC SCREENS.

HERETOFORE, says Herr Haas, grained glass photographic screens have been made either by engraving in regular lines or by etching the plates, previously dusted over with asphalt powder, with the vapour of hydrofluoric acid.

Screens thus etched present an irregular grain, which, for most photographic purposes, is preferable to that of the ruled screens; but it has only been possible hitherto to produce etched plates of a very limited size, say  $7\frac{1}{2} \times 7\frac{1}{2}$  cm., and it was not possible to obtain such sharpness of etching as to render the screens fully equal to the ruled or geometrically grained screens.

Now, according to the present process, screens may be made of any size desired and with all requisite sharpness. This result is obtained by a special method of dusting, whereby a uniform distribution of the

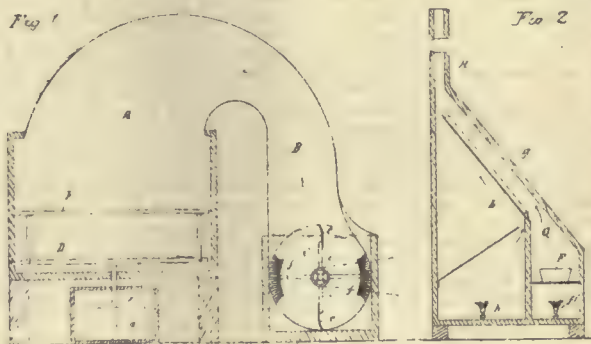
asphalt dust is effected over the whole surface of the plate, and by special expedients in the etching operation.

The dusting operation is effected in such a manner that only the finest particles of dust are allowed to settle upon the glass plate. Within a closed chamber a powder, composed of a mixture of asphalt and "dragon's blood," is agitated and thrown up into the condition of a whirling cloud of dust which ascends through a vertical passage connected at top with the upper part of a dusting-on chamber, so that only the very lightest particles pass into this second chamber, wherein the glass plate to be grained is supported beneath a fine-meshed sieve upon a rotating table. The plate having been so dusted on, the dust is caused to adhere by being melted on in the usual manner.

The drawbacks of the etching operation as hitherto practised are considerably counteracted by uniformly heating the plate whilst the latter is exposed to the vapours of hydrofluoric acid, which will thus be prevented from condensing upon the plate, the arrangement for heating the plate being such that the vapours only pass over, and not under, the plate. The result is to produce a comparatively weak and accurately distributed action of the hydrofluoric acid upon the uncovered portions of the glass plate, violent impact of the vapours upon the plate being entirely obviated, whilst condensation of liquid acid upon the plate, and the consequent eating away of the glass under the dust particles, is prevented by the heating of the plates, and by the admixture with the asphalt of "dragon's blood" or of a similar resin.

The process is carried out in practice in the following manner:—

Referring to fig. 1, A is the dusting-on chamber, which communicates by means of the vertical channel, B, with the dust-stirring-up chamber, C. Within the chamber, A, the glass plate is supported on a rotary table, D, mounted on a vertical axle, E, adapted to be rotated by means of clock-work, F, a sieve, G, above the plate being mounted on, and rotating as one with table, D. The mixture of finely powdered asphalt and "dragon's blood" is introduced into the stirring-up chamber, C, wherein leather pallets, E, and brushes, F, carried by revolving arms, G, mounted on a horizontal shaft driven exteriorly by a belt, stir the dust up into a whirling cloud and project it upwards, so that only the very finest particles pass up through the channel, B, into the chamber, A, where they pass through the sieve, G, and settle upon the plate carried on the table, D.



The plate, after being thus treated, is heated in any suitable manner so as to produce adhesion of the dust by melting it on the plate, and the back of the plate is coated with a suitable varnish to protect it from the action of the hydrofluoric acid. The plate thus prepared is placed in the apparatus shown in section in fig. 2, wherein F is the vessel from which gaseous hydrofluoric acid is generated by the action of the flame, F', and rises through an inclined passage, G, at the upper part of which the glass plate, Z, to be etched is placed, the plate being arranged in any suitable manner (for example, it may be simply laid upon its back) on the lower side of the channel, G, so that the hydrofluoric acid gas must pass between its upper face and the wall, G, of the passage on its way to the uptake, H.

Below the support on which the glass plate, Z, is laid there is a second chamber, heated by a flame, H, from which the gases are caused to impinge upon the back or under side of the plate support, so as to heat the plate, Z, sufficiently to prevent condensation of the hydrofluoric acid vapours upon it.

#### A STRUT FOR PHOTOGRAPHIC FRAMES.

MESSRS. WALLS & BOYNETT carry out their idea in the following manner: The strut or support works on a pivot, thereby allowing the frame, easel, and the like to be placed in any position without detaching the said strut or support.

Fig. 1 shows the strut or support, which revolves on the pivot as shown by letter A.



Fig. 2 is a sectional part, showing the pivot passing through the disc, as shown by letter a. That part which revolves on pivot a is shown by letter b, the disk being a fixture.

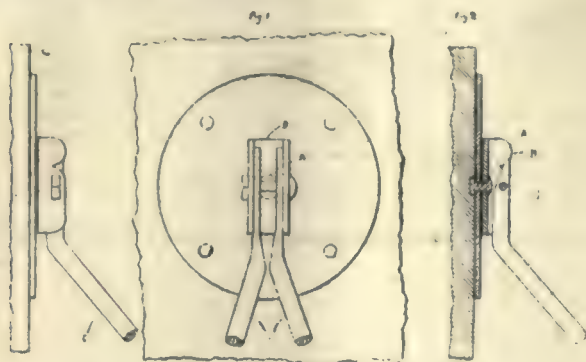


Fig. 3 shows a side view of the strut or support when it is attached to the photographic frame.

## News and Notes.

**PHOTOGRAPHIC CLUB.**—April 12. Trade Night. New Apparatus, Novelties, &c.

**BRADFORD PHOTOGRAPHIC SOCIETY.**—The Annual Dinner took place on Monday, March 27, when about forty members and friends assembled. The President (Mr. Percy Lund) occupied the chair, and among the visitors were Mr. Godfrey Bingley (President of the Leeds Photographic Society) and Mr. Thomas Heaps (President of the Keighley Photographic Society). The most interesting toasts were those of the Bradford Photographic Society and the Yorkshire Photographic Union, the former being proposed by Mr. Godfrey Bingley, and responded to by Mr. Percy Lund, while the latter had as proposer Mr. George Thistlethwaite, and responder Mr. E. Clough. After the toasts there was a varied programme of music and recitations, to which the following ladies and gentlemen contributed: Miss Lily Ellison and Miss E. Ellis, Messrs. Alex. Keighley, Frank Robinson, Kershaw, and C. W. Maw. Two important presentations were made. Mr. John Snowden, who had recently retired from the Secretaryship of the Society, having occupied that position since its inception five years ago, received a handsome case of cutlery from the members as an appreciation of his services. In making the presentation, the President remarked that Mr. Snowden had earned the good feeling of his fellow-members, and had worked hard for the success of the Society in the early days, when its affairs did not run quite so smoothly as at the present time. Mr. E. Clough (Secretary of the Yorkshire Photographic Exhibition) was the recipient of an elegant épergne from the Committee of that Organization, in acknowledgment of his arduous labours in connexion with the recent successful Exhibition. Mr. Alex. Keighley (Chairman of the Exhibition Committee) made the presentation.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
10.....	Bradford Photo. Society .....	An Easy Method of Microscopic Photography. J. Leadbeater.
10.....	Camera Club .....	The Pyrenees. Herbert Spender, M.A.
10.....	Putney.....	Trimming and Mounting Photographs. Rowland C. Whiting.
10.....	Richmond .....	Lantern-slide Competition.
10.....	Southport .....	Platino-type Printing. George Cross.
11.....	Hackney .....	Still-life Photography. J. Carpenter.
41.....	Royal Photographic Society .....	The Correct Exposures to be given to Photographs of the Corona. E. W. Maunder.
12.....	Brentford .....	Declaration of Result of Exhibition and Arrangement of Summer Programme.
12.....	Croydon Camera Club .....	Lighting and Exposure. Francis T. Beeson, F.R.P.S.
12.....	Leeds Camera Club.....	Lantern and Slides. J. W. Garbutt.
12.....	Photographic Club .....	New Apparatus, Novelties, &c.
13.....	Camera Club.....	My Adventures with the Pigmies and Cannibals in Central Africa. Alfred Lloyd.
13.....	London and Provincial .....	Modern Hand Cameras.
13.....	Oldham .....	Exhibition of Members' Transparencies.
13.....	Woolwich Photo. Society .....	Portraiture. Harold Baker.
14.....	Croydon Microscopical .....	Conversational Meeting.
14.....	Leigh .....	Competition: Frauded Exhibition Picture.
14.....	West London.....	Bicycle and Camera. L. Selby.

### ROYAL PHOTOGRAPHIC SOCIETY.

MARCH 23,—Technical Meeting.—Mr. T. Bolar, F.I.C., F.C.S., in the chair.

#### OZOTYPE WITH CARBON TISSUE.

Mr. THOMAS MANLY read a paper upon the subject of his new printing process, "Ozotype with Carbon Tissue," a method of photographic pigment printing without actinometer, transfer, or safe-edge, details of which were published in the last issue of THE BRITISH JOURNAL OF PHOTOGRAPHY (p. 198). The action of light upon chromic acid being thus expressed,  $\text{Cr}_2\text{O}_3 + \text{light} = \text{Cr}_2\text{O}_3 + \text{O}_2$ , he expressed the belief that in the ordinary carbon process the nascent or newly liberated oxygen combined with and changed the nature of the gelatine, but in ozotype it was made to do work in another way. Paper was coated with a solution of a bichromate salt and a manganous salt, and by the action of light the eliminated oxygen entered and decomposed the molecule of the manganous salt, producing an image in the sesquioxide or manganic oxide, the active oxygen being thus locked up for future use, while at the same time the image was visible and insoluble, so that the unchanged salts could be readily removed by washing. Only the acid light-sensitive compounds of chromium could be used, for decomposition immediately followed the addition of the neutral chromates to a manganous salt. The image at this stage was light brown in colour, and the next question for consideration was how to get the manganic oxide constituting the image to take up the pigmented gelatine of carbon tissue. For this purpose the phenol-derived photographic developers were useful, and small quantities of such substances added to about one-half per cent. solution of acetic acid made a bath in which the carbon tissue could be immersed, and which rendered it possible to produce a picture possessing all the half-tones and details of the negative. For well-printed proofs from good negatives the following formula was recommended:—

Water .....	1000 c. c.
Glacial acetic acid.....	2 to 5 "
Hydroquinone.....	$\frac{1}{2}$ gramme to 2 grammes.

A variety of effects could be obtained by modifying the quantities of the ingredients, the addition of acetic acid in very small quantities producing contrast, and increase of hydroquinone giving soft effects. The method of procedure was as follows: Print until the details in the high lights are visible, the sensitive paper being of about the same rapidity as platinotype paper; wash out the unchanged salts and dry; immerse the carbon tissue (unsensitized) for one minute in the acetic solution, the temperature of which should not be less than 65° and not higher than 75° F.; then place the print in the same solution, bring it into contact with the gelatine surface of the carbon tissue, remove them together, squeeze, and dry. When dry, the print and the adherent tissue are placed in cold water for not more than half an hour, and it is then ready for development in water at a temperature of about 102° F., thus dissolving those portions of the pigmented gelatine which have not been rendered insoluble by the action of the oxide constituting the original image. Mr. Manly demonstrated the various stages of the process with much success, and exhibited a large number of prints illustrating the results obtained with different tissues and the appearance of the unpigmented image.

Mr. BURTON said he had made some experiments with the process, and, although some further investigation was desirable, the results he obtained were of a satisfactory nature.

The Rev. F. C. LAMBERT said he had that day successfully developed some prints sent to him by Mr. Manly in July last. He asked whether phenol developers other than hydroquinone had been tried.

Mr. MANLY replied that pyro-catechin answered very well, but pyrogallol caused a stain; metol was good, but he did not recommend the amido developers. Convenient proportions for the sensitizing solutions were two parts of manganous nitrate or sulphate to one part of bichromate of potassium.

Mr. PAUL MARTIN alluded to the greasy appearance of the shadows in most carbon prints, due, to a great extent, to the excessive thickness of the tissue, and he asked whether a tissue less strong in gelatine would work equally well for ozotype printing?

Mr. MANLY said it would answer very well.

Colonel WATERHOUSE remarked that in hot climates, where carbon tissue rapidly became insoluble, Mr. Manly's process would probably be found very useful.

#### COMING EVENTS.

April 11, Ordinary Meeting. "The Correct Exposures to be given to Photographs of the Corona," by Mr. E. W. Maunder. April 18, Photo-mechanical Meeting. Exhibition of Apparatus.

### PHOTOGRAPHIC CLUB.

MARCH 29.—Mr. Frank Haes in the chair.

Mr. A. Mackie passed round a bottle of pyro solution made up in 1888, and tested in 1893 and rebottled. It was quite colourless, and at the last test worked very well.

Mr. F. A. Bridge showed a print in which he had striven to give the effect of a narrow lane lighted up by a great fire. The print was made without faking and subsequently stained, and the results certainly presented the appearance it was intended to give.

Mr. Clark showed some illustrations of what might be done by means of the half-tone process in advertising. He also showed a piece of a new alloy for photo-lithographing. The image transferred to it was as sharp as it would be upon a copper plate, and the alloy had all the advantage of a lithographer's stone as far as absorbed property was concerned, while for storage purposes it stood far ahead. Aluminium played the principal part in the alloy. The plate was printed from the negative with bichromate and albumen, and developed with a coating of printing ink and washing in water.



Mr. H. VIVIAN HYDE, F.R.P.S., gave his promised display of slides of

#### LOWESTOFT AND NEIGHBOURHOOD,

accompanied by a running commentary or chat upon the features of interest as they appeared. There was a pleasing variety of subjects, from the fishing smacks and quays, the markets, and harbour scenes, back through quiet lanes and meadows to the country of the Broad behind. The groups of fisherfolk in the first, and the picturesque yachts and wharries on the endless expanse of the rush-fringed Broad were charming examples of their kind, and the whole exhibition elicited the highly commendable remark that they reminded one very forcibly of the Club lantern-slide displays of olden times.

A hearty vote of thanks was passed to Mr. Hyde for his exhibition.

#### Newcastle-on-Tyne and Northern Counties Photographic Society.—

##### BINOULAR PHOTOGRAPHY.

At the last meeting of the Society Mr. J. HEDLEY ROBINSON, assisted by the Rev. Mr. OGDEN, demonstrated this subject in a very novel manner. All the diagrams illustrating the transposition of the prints before mounting were shown on the screen by means of a triple lantern, by which method Mr. Robinson was able to superimpose one diagram upon another, and thus explain the proper mounting of the prints. The lecturer also exhibited a very ingenious trimming board of his own invention, which so simplified the cutting of the prints as to render this part of the operation almost automatic. A small cutting board has a strip of brass fixed along its bottom edge in such a way as to allow the print to be slipped underneath, the print is adjusted so that the cutting edge of the brass bisects the same object in the foreground of both prints, two screws then clamp it down, the trimming shape is then adjusted on the left-hand print so as to include the exact picture desired, which is then trimmed with the exception of the foreground. The shape is then placed on the right-hand print, so as to include a little less on the left-hand side than was shown on the corresponding side of the other print. The right-hand print is now trimmed, and the knife finally run along the brass strip.

#### FORTHCOMING EXHIBITIONS.

1899.

April 7-May 13 ..... National Trades and Industrial Exhibition, Bingley Hall, Birmingham. Manager, Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.

„ 12, 13 ..... Plymouth Photographic Society. Hon. Secretary, W. H. Harris, 91, Cobourg-street, Plymouth.

## Correspondence.

\*.\* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\*.\* We do not undertake responsibility for the opinions expressed by our correspondents.

#### AN EASTER EGG—VULCANISED CAOUTCHOUC.

To the Editors.

GENTLEMEN,—Has any one found the following dodge before?

In hand-camera work the necessity of suddenly seizing a moment for the exposure, while still maintaining the steadiness of the camera, makes it extremely difficult to avoid a jerk.

Well, pop the ball of your pneumatic release between your teeth, and you will find the difficulty surmounted, especially when (as in a crowd) you have to hold the camera above your head or against your forehead. It is a fact that the jaw can be moved with less reaction ("rick") in adjoining parts than any part of the body except the eye, and we are in the constant habit from birth of moving the jaw without imparting the slightest motion to the rest of the cranial bones. True, this is a method of exposure of oneself to the derisive delight of the urchins ecstatic with their discovery of the newest and latest sort of donkey, but that does not influence the plate.—I am, yours, &c.,

HYPOCAMERITE.

#### THE FUTURE OF PHOTOGRAPHIC ASSISTANTS.

To the Editors.

GENTLEMEN,—May I call the attention of "F. S." and other photographic assistants to an article in the 1899 BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, p. 787, by Mr. Arthur Field, where a full description is

given of a trade union open to receive any photographic assistant. There is thus no need for "F. S." to wait one moment before setting to work to bring about the reforms he desires. I had thought these facts were known to every photographer, but apparently there are some so little interested in their professional position as to be ignorant of events of the most vital importance. Assume the same lack of interest in the operations of the dark room and the printing room, and we have a possible explanation of the surplus of incompetent assistants. My own experience is that the assistant who keeps himself well informed and up to date is not usually amongst the unemployed. No trade union is a cure for apathy, and can only be really effective when some eighty per cent. of the trade are enrolled. Given such a pitch of organization and all the moral qualities it implies, and we may then use it as a weapon of defence against the attacks of modern capitalism. The whole secret of the matter is thus to replace apathy and indifference by a lively and common interest through organization, and I trust that "F. S." will throw all his energies into this work.

The union above referred to deals with all the matters which press hardly on the photographic assistant; it gives legal advice, takes legal action on behalf of members, and last year 60% was recovered from employers by such action. No operator need be afraid of losing caste by becoming a member, for it is thoroughly "respectable." Secretaries and members even go so far as to appear at times in that black, shiny headgear, in the form of a cylinder, popularly known as the "top hat."—I am, yours, &c.,

JOHN A. RANDALL.

To the Editors.

GENTLEMEN,—Feeling the importance of the subject *re* assistants and their grievances, I beg leave to intrude again on your valuable space. I venture to think the real cause of the troubles to lie in the fact, that a photographer cannot tell what he is getting until he has engaged his assistant. "Specimens and photograph of self," which we so often see in THE BRITISH JOURNAL OF PHOTOGRAPHY, is inserted for the purpose of getting some idea of what the prospective assistant will be.

A week's trial, as suggested by one correspondent, would be almost impossible in a great many cases, but how much better if there were some means of knowing just what an assistant was capable of. This, however, cannot be arranged unless an influential move be made for the purpose. The granting of certificates by local institutes would be awkward in many places; and it occurs to me that there should be an institution probably where work could be sent in for examination, and where not only an opinion is passed upon the work, but a certificate granted. Now, just as the chemist qualifies for his certificate or diploma, so I think a practical examination should be open to the photographic assistant.

Suppose a department in such an institute to keep a supply of negatives which could be sent on to a "printer," let us say, who wishes to pass in carbon (single and double transfer), platinotype, P.O.P. (gelatine), albumen, collodio-chloride, or bromide contact work, which he must print and finish and return; then, if his work merits such distinction, let the institute book him as a "first-class printer." He would also hold the society's certificate as such. The same with retouching. These specimen prints could be kept by the society, and photographers coming to London (as many do) could easily see such prints if they cared to. Here, however, is a difficulty in dealing with posing and lighting. Such operators would have to come up to pass. When an assistant had not the means of making enlargements, he would have the advantage of doing so at such a place, and it would be a very simple matter to judge of a novice at the game.

A man under such circumstances, I fancy, would not have to stand long waiting for an engagement, and neither need there be any need for a good house to get hold of an unqualified man. Trusting to see something done before long to make things more equitable than at present,—I am, yours, &c.,

F. G. WILLIATT.

101A, Fulham Palace-road, Hammersmith, W.

## Answers to Correspondents.

\*.\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\*.\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\*.\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

#### PHOTOGRAPHS REGISTERED:—

W. G. Honey, 102, Patrick-street, Cork.—Two photographs of eight St. Bernard puppies.

A. JOHNSTON.—We believe the camera named fulfils all your requirements.



**CARBON PRINTING.**—C. BIGWOOD. You cannot have a better manual than the one you have. The sensitising of the tissue is, in practice, not the troublesome operation you seem to imagine; but, as a beginner, we should advise you to purchase it, at least at first, ready-sensitised. It is supplied in that state by Messrs. Elliot & Son, and by the Autotype Company. By so doing you will ensure having it in the proper condition for work.

**STUDIO.**—Z. W. If the Surveyor to the District Council has condemned the plans for the studio, we should advise you to get them modified to suit his requirements, for you may fairly assume that, as they are, the Council will not pass them. Your reading of the Building Act may be correct, and the law may be on your side, but, if you work in opposition to the Council, it will cost you a deal of trouble and expense, even if you succeed. It will also entail a considerable loss of time in getting the studio into use.

**PROPOSED AGREEMENT.**—NEMO. The draft copy of the agreement sent is similar in terms to several we have had sent us recently. It is all on one side, and that on the side of the employer. You say that you and your work have been well known in the town for several years, and, if you sign this one year's agreement, at the end of it you will not be able to practise photography in the town, nor even in the county, for three years afterwards. You should seriously consider whether it is worth your while to make so great a sacrifice on a year's agreement.

**STUDIO BUILDING.**—R. J. SCOTT says: "I am having a studio built from north-west to south-east, and should feel obliged if you would tell me which is likely to be the best end to place sitters? I ask your kind advice, as I want to be prepared to build dark room at the most convenient corner."—In reply: It is not stated whether the studio is to be lighted from both sides or one only. If the latter, it had better be arranged so as to place the sitters at either end. The dark room can then be placed on the dark side, midway between the two ends, that is, supposing the studio will be wide enough to contain it.

**CHLORIDE OF GOLD SOLUTION.**—J. WILLIS says: "I made up a stock solution of chloride of gold—one tube in two ounces of water—for sulphocyanide toning. After it had stood a day, there was a reddish metallic deposit at the bottom of the bottle. When some of the solution was added, in the proper proportion, to the sulphocyanide solution, I could get no toning action at all, even after two hours. I have made a second solution of gold, but with similar result. Why?"—Evidently the solution was made in a dirty vessel, or the water used was impure, and thus the gold became precipitated.

**THE NATIONAL GALLERY PICTURES.**—S. R. G.—We think you are misinformed. Amateurs are not allowed to photograph the pictures in the National Gallery, neither is there a photographic studio there in which the work could be done. Those professionals who have obtained permission to copy them have had to do the work in the different rooms in which the pictures are. A foreign firm, many years ago, had permission to put up a temporary studio outside the building in which to copy some of the works, but such a thing has not been allowed since, and possibly never will be again, so great was the indignation expressed at the time.

**GREEN PRINTING.**—T. AGER says: "Will you advise me how to proceed under the following circumstances: I want to produce some bright green prints, but cannot succeed after numberless trials, as they are all badly stained. 1. Can these prints be produced without this yellow tint in the high lights? 2. Can this yellow tint be removed by after-treatment? I presume it consists of chromate or lead. I find a very weak bath of sulphuric or hydrochloric acid 1 minim per ounce will remove the yellow, but very unequally, and a prolonged time or a stronger bath quickly converts it into an ordinary blue print. The specimen I enclose was produced as follows: Matt P.O.P. printed deeply and washed for half an hour under a spray producer; fixed for half an hour in strong hypo (twenty-five per cent. solution); washed for four hours; bleached by ferricyanide of lead; washed for half an hour; immersed in bath of neutral chromate of potassium; washed for half an hour; developed in bath of perchloride of iron; soaked in several changes of weak acetic acid; washed for half an hour."—Possibly some reader who has had experience with this method of producing green prints will give our correspondent the desired information.

**MOUNTING PRINTS WITHOUT COCKLING.**—R. B. HUGHES says: "I wish to put some prints in an album without cockling. An answer of yours to a correspondent some time ago scared me into giving up rubber solution, and I cannot manage mountaint given on p. 1061 of the ALMANAC. It 'jellifies' too quickly (my fault, no doubt). I obtained some white shellac from Chapman, Manchester, but it was wholly insoluble in boiling spirit. Can you kindly tell me, in your Answers to Correspondents, whether your remark about the resinising of rubber solution applies to its condition before use so as to prevent adherence, or to a change taking place afterwards, causing the print to loosen after having once apparently stuck firmly? Shortly, if the rubber causes firm adherence once, will it remain so for I have prints mounted since a long time without showing any signs of coming off; but one does not like the idea of a possible peeling off of prints in the future in an album intended for presentation."—In place of the No. 1 gelatine, try the No. 2 Autotype of the same makers, using three ounces instead of four, as given in the formula. If the shellac will not dissolve in alcohol, it shows that it is not a good sample, probably through long keeping. Indiarubber is a very uncertain mountaint; at times the prints will remain firmly adherent for years, at others they will come off in a few months. The reason for this difference is not easily accounted for.

**STUDIO BUILDING.**—A. V. says: "I shall feel obliged if you will kindly give me your advice on the following: I have the offer of proposed studio 25 feet in length, and, before accepting, would like to know if 25 feet would be considered sufficient, or ought it to be longer in order to carry on the best work? Are there any of the leading studios no longer than 25 feet? I should prefer a studio not less than 30 feet, but in this case it is impossible. Width is ample from 15 to 18 feet; it is in the length I am doubtful."—Twenty-five feet is a rather inconvenient length for professional work. Still there are many studios no longer, in which excellent work is produced. We should not advise you to discard the offer if the situation is good.

**FORMULA FOR RETOUCHING MEDIUM WANTED.**—NEMO says: "Will you kindly favour me with the following: A good formula for a reliable retouching medium, also a formula for toning with sodium formate. My experiments up to the present with the latter have been very varied—good, bad, and indifferent. Also will the bath keep, or does it have to be made up fresh?"—The formula for a good and reliable retouching medium is given on p. 1063 of the ALMANAC. The formula for toning with the formate of soda has been given in the last volume of the JOURNAL, and is that you are probably using. As you say you sometimes get good results, it shows that the formula is all right, and that, when you get bad and indifferent, it shows that the manipulations are at fault. Note the conditions when you get good results and follow them, then you will always get good results. The bath is better used freshly made.

**BUSINESS DISPUTE.**—A. says: "Last year I bought the business of — at this place, upon the strength of the returns for the previous two years. During the time I have had it the returns have not been equal to half that. Soon after I had entered into possession, the operator to the previous owner, whose services I did not require, opened a place close by, and, I think, has done me some injury, and thus reduced (to an extent) the returns. I had to pay for the business by four instalments, the last of which will shortly be due. Should I not be justified in repudiating this, as the returns have been less than half those represented to me?"—No; we should say not, unless you can prove that the represented takings were false, and that you were fraudulently deceived. In the case of legal proceedings, your predecessor would probably plead that your work was not so good as his, or the sitters did not like you so well and transferred their patronage to his former operator, &c. When a photographer sells his business, he cannot guarantee that his customers will remain with his successor. If the returns represented to you were honest, you have nothing to complain of.

**IODIDE OF SILVER.**—A. E. H. says: "I understand that, when silver iodide is formed in the presence of an excess of the halogen salt, it is insensitive to light. Can you inform me whether this property can be used in a wet-plate process as follows: Prepare an emulsion of iodide of silver, say, 20 grains of nitrate of silver and 20 grains of potassium iodide to the ounce of collodion. When plates are set, immerse in a ten per cent. solution of potassium iodide to ensure the thorough conversion, and then wash well. When required for use, sensitise with a twenty to thirty grain solution of silver nitrate, and expose wet. If this is practicable, cannot the emulsion be prepared by dissolving the two salts directly in equal quantity of good commercial collodion, and mixing them gradually with constant agitation? I have not overlooked the 'Daylight Process' dealt with by you a few years back, but my suggestion slightly differs from those."—We have made no experiments ourselves in this direction, and we can see no advantage in doing so. It would simply mean introducing more operations, and elements of uncertainty in the wet-collodion process without any corresponding advantage.

**COPYRIGHT.**—JOSÉ ANGO says: "I shall be pleased to obtain your opinion with regard to the following: Some time ago I sold some views taken by myself of this island to a Moravian parson, who forwarded same to a firm in Germany. They have printed thousands of copies on post cards, and are sold in this island by a merchant without my sanction, and thereby cause me to lose a great sale for my views. Could I claim damages against either the firm or the parson, as I think it extremely hard lines, as my profession cost me a good deal of money, and I never bargained for such mean tricks to be played? I may mention that I have no copyright, as I have written several times to Mr. Henry Gower, the Secretary of the British Photographic Copyright Union, and have not up to the present time received any reply. Is it necessary for me to obtain a copyright, and, if so, how can I obtain one out here?"—We are not conversant with the law as regards copyright in Antigua; but as you say you have no copyright in the photographs, you can of course obtain no recompense either from the parson or the merchant. If you wish to copyright any photographs here, send us three copies and ls. 7d., and we will make them copyright for you.

\* \* Many answers to correspondents are unavoidably held over.

DRS. LANG and Melzing, of Vienna, have succeeded in taking photographs of the mucous membrane of the stomach in the living subject. A stomach tube some sixty centimetres long, and with a diameter of eleven millimetres, is provided with an electric light at its lower end, and at the upper end is a camera. The stomach is first emptied of its contents, and, after being washed, is distended with air. Then fifty pictures or more can be taken in rapid succession in from ten to fifteen minutes. The apparatus can be turned on its axis, so that all parts of the mucous membrane can be photographed. The photographs are naturally very minute.



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## EX CATHEDRA.

ELSEWHERE in the JOURNAL this week we reprint from the April number of the *Philosophical Magazine* a paper by Professor R. W. Wood, of Wisconsin University, entitled "An Application of the Diffraction Grating to Colour Photography." From this interesting paper it appears that Professor Wood has succeeded in obtaining natural-colour photographs by superposing reproductions of diffraction gratings on glass positives made from negatives obtained by the three-colour method. The finished result is viewed as a transparency through a lens. Professor Wood's method, so far as we know, is quite novel, and, given the possession of the necessary diffraction grating, appears exceedingly easy to put to the practical test. His paper, which is a very important contribution to the study of the problem of colour photography, is well worth careful consideration.

\* \* \*

THE inevitable result of a rise in price of the foreign-made papers for photographic purposes has at last commenced to

manifest itself. We understand that an English house has taken up the manufacture of paper for baryta coating, and that before long it will be in use by at least one of the firms who turn out gelatino-chloride papers, &c., in this country. The quality of the new English-made paper is said to be of the highest.

\* \* \*

IN a small portion of our issue of March 31, the word light-filters in Messrs. Cadett & Neall's advertisement was inadvertently printed throughout as light-fitters. As the "copy" from the JOURNAL was directed to be taken for use in our contemporaries, the word light-fitters was thus unfortunately reproduced that week. This explanation of the origin of the misprint is therefore due to Messrs. Cadett & Neall and their extensive clientèle.

\* \* \*

FREQUENT allusion has recently been made in these columns to the case in which a Shettleston hawker brought an action for damages against the local camera club for taking and exhibiting, without his authority, an instantaneous photograph of him whilst he was driving in a public thoroughfare. The case came before the Sheriff-substitute a few days ago, and the action was dismissed with costs. In a note the Sheriff-substitute observed, "In the view which I take it is unnecessary to determine whether the Shettleston Camera Club is properly convened to this action by calling certain of its alleged office-bearers. I am disposed to think in a small limited club that all the members should have been cited. It was further said by defender's agent that the office-bearers called were not *de facto* the present office-bearers of the Club, and, if this be the true state of matters, there can, I think, be no doubt that the action is not properly directed. However, it is better that the action should not be dismissed upon a technicality if it can be decided on the merits. Pursuer prefers a claim of damages for 150*l.*, on the ground that, without his authority, a snap-shot photograph of pursuer was taken when he was driving in a street in Shettleston, and has since been exhibited in a cinematograph exhibition. There is no allegation that the pursuer has been caricatured in any way, and, without some authority to hold a claim of damages competent in a case of the kind, I am not prepared to entertain what is a novel claim of damages. I express, in the mean time, no opinion on the question of



whether petitioner might not be entitled to obtain interdict against a photograph, obtained without his knowledge or consent, being made use of in a public exhibition. That is not the question which has to be decided in the action as laid."

\* \* \*

THE decision in the case is a common-sense one. It amounts to this: That you are legally entitled to take photographs of people in public thoroughfares and to privately exhibit them. We imagine that the same immunity would apply in the case of a public exhibition, although the Sheriff-substitute, with native caution, declined to commit himself to an opinion on the point. Still it is obvious that where the elements of ridicule or contempt are absent, and the person photographed is not libelled or damaged by the public exhibition of his photograph not improperly obtained, no ground of objection could reasonably lie. We take it that in the event of a person finding himself obliged to proceed in the courts in consequence of the exhibition of a photograph which he considered damaging to his character or reputation, an action for libel would be the course to take. The result of such an action would be decidedly interesting, as so far, we believe, the point has not cropped up in the courts.

\* \* \*

THE Committee of the Camera Club have for some time had under consideration a scheme for taking larger premises, but in the last number of the *Journal* it is stated that further consideration of the scheme is deferred, and the Club will be carried on in its present quarters as hitherto. The *Journal* also makes the following announcements:—The Annual General Meeting of the Camera Club Company, Limited, will be held at the Club House, at 5.30 p.m., on Monday, April 17. The Members' Exhibition will open on Monday, May 1; pictures for exhibition should be sent in on or before Thursday, April 27. The Ladies' Evening has been fixed for Tuesday, May 2, and it is hoped that Mr. Stroh will give a demonstration of his phonograph. The Annual Dinner will take place at the Club House on Thursday, May 4.

\* \* \*

THE Directors of the National Gallery last week issued their report for the year 1898. The report states that the Gallery in Trafalgar-square was visited by 422,913 persons on the free days during the year, showing a daily average attendance on such days (209 in number) of 2023. In addition to the above number, 30,635 persons visited the Gallery on the thirty-one Sunday afternoons on which it was opened during 1898, showing a daily average attendance of 988. The National Gallery of British Art, at Millbank, has been visited by 190,994 persons on the free days during the year, showing a daily average attendance on such days (209 in number) of 913. In addition to the above number, 41,853 persons visited the Gallery on the thirty-one Sunday afternoons on which it was opened during 1898, showing a daily average attendance of 1350.

\* \* \*

WE are informed that at the Tribunal of Commerce, Paris, on January 17 last, the Eastman Kodak Société Anonyme Française brought an action for damages against the defendants, Dr. Krügener and M. A. Schmand, for having

issued certain circulars, stating that the manufactures of the defendants surpassed the Kodak apparatus, and in other ways making unfavourable comparisons. The defendants were declared guilty of unfair competition, and were prohibited from printing or distributing in the future circulars mentioning or in any way alluding to the name Kodak or that of the Eastman Company, under the penalty of 50 francs for each infraction found. The seizure and destruction of all incriminated circulars was ordered, the defendants were required to pay a sum of 1500 francs as damages, and to publish at their own cost, to the extent of 350 francs, the judgment in Parisian and provincial newspapers.

\* \* \*

FROM Messrs. Tennant & Ward, publishers, of 289, Fourth-avenue, U.S.A., we have received the first number of the *Photo Miniature*, a monthly magazine of photographic information. The scope of the magazine is restricted to the treatment in each number of some single, but important, branch of photography, and for the first issue the subject of "Modern Lenses" has been chosen. The article occupies thirty-six pages, and gives a great deal of information which may serve as a useful introduction to the study of a larger and more complete account of the properties of modern photographic objectives. The *Photo Miniature* is neatly printed and produced, and we wish it success. It is obtainable from Messrs. Dawbarn & Ward, Farringdon-avenue, London, E.C., at the price of 6d. per copy.

\* \* \*

WE are pleased to learn that the Government of the United States are alive to the value of photography as a recorder of events of national or historical interest. It is announced that the American War Department has undertaken the compilation of a photographic history of the war with Spain. It has addressed a circular letter to all the officers in the service, asking them to contribute such prints, films, or negatives, as they may have in their possession, promising to return such loans in good condition. It furthermore asks all officers to report the names of the persons known to have carried cameras in the region of active operations, so that their aid may be sought in compiling the volume. It is the desire of the department to produce in a single volume every obtainable feature and photograph bearing on the subject. Readers of the newspapers are aware that in the exciting campaign, both naval and military, the camera played an important part, and the proposed photographic history of the war should be both complete and interesting.

#### MORE COLOUR FALLACIES.

Two months ago we devoted an article \* to the examination of a theory of colour photography which implied that, "under proper conditions" (not specified), "perhaps under all conditions," the colours of an object might impress themselves on an ordinary photographic plate, and be transmitted in turn by the negative to a sensitive positive printing surface on glass or paper. We pointed out that this theory, which was due to Mr. Romyn Hitchcock, who brought it before the

\* THE BRITISH JOURNAL OF PHOTOGRAPHY, Vol. XLVI., No. 2025, pp. 114-115.



American Association for the Advancement of Science last year, was not deserving of serious consideration in the present state of our knowledge of the phenomena of light and colour and the influences they exert on sensitive compounds. In short, the idea appealed to us, as it must appeal to every one having the least acquaintance with the philosophy of the subject, as sheer empiricism of an entirely speculative nature.

It is not a little remarkable that both here and in America the most absurd notions on the subject of colour photography emanate, not from persons who, in right of absolute ignorance of even the most ordinary photographic processes, have some claim on our compassion when they air their amusing views on the manner in which the reproduction of colour may strike them as possible of achievement, but from people who might be supposed, in virtue of their scientific position or assumed knowledge, to at least have the ability to refrain from publishing absurdly erroneous ideas on a matter which supplies considerable facilities for going wrong. In the last-mentioned class of persons we are driven to include a self-styled lecturer on physics and chemistry, Zerban by name, who is a very recent writer on the subject of colour photography.

Mr. Zerban's contribution is printed in the *Photo American* for March, and the Editor of that interesting publication evidently thinks so highly of what a lecturer on physics and chemistry has to say about colour photography that he heads it with the words "Prize Article," thus doubly avowing responsibility for Mr. Zerban's utterances. The latter possesses in some respects the elements of novelty and originality, but, we are obliged to say, at the sacrifice of accuracy. It is apparently Mr. Zerban's aim to demonstrate a close acquaintance with the theory of his subject. Now, in that aim he is conspicuously unsuccessful, for, though in the course of his preliminary observations he informs us that he has "swamped" (*sic*) "some of his most illustrious fellow-chemists" in the matter of knowledge, we fail to see how he sustains his position by the mysterious and unilluminating deliverance that "we know too little of the silver salts constituting" (*sic*) "photography." Even so; but why does Mr. Zerban allow the context of this Delphic utterance to leave us in doubt as to whether he personally knows anything at all about the silver salts, the properties of which have surely not suffered from the lack of attempted elucidation on the part of the most distinguished investigators of the time?

We said there were original ideas in Mr. Zerban's paper. Witness this description of the Lippmann process:—

"Lippmann placed a highly polished mirror or a trough filled with mercury back of his film, which is transparent and has the sensitive chemical *in* and not *on* it, as is the case of kodaks and cameras (*sic*). In this way the film is attacked by both direct and reflected light. This film fits into a holder in the camera, just as others. In front of the camera a red glass screen is placed, the shutter opened, and the film exposed to the object. This screen allows only red and yellow light to pass through it, so that only those parts of the object are photographed which contain these colours. Next the red screen is removed and another is substituted. This second screen passes all colours except blue. After this second exposure, the same film is again exposed without any screen intervening, so as to get the blue impression. Then it is removed to the dark room and developed. When finished and dried, the picture can be seen in its natural colours by looking through the film with the mirror back of it. Angels and ministers of grace, defend us!—Eds.] The mystery seems solved, but there are countless difficulties yet to be overcome. Pictures can be taken in this way, but the arrangement is tedious and requires skilful handling by an expert. Only the three primary

colours are taken into account, as the others are mere compounds that form themselves. Under the red screen, exposure of from one half to two hours is necessary, yellow a few minutes, and the last a second or two. Red light is slowest (that is why dark-room lanterns are provided with ruby glass), yellow faster, and blue quickest. This explains the difference of exposure. I have reversed this operation, but it was not successful. So much for this method."

Yes, so much for this method! According to Mr. Zerban, it is a hopeless jumble of the interference and three-colour systems of photographing colour, the mere description of which is calculated to set Professor Gabriel Lippmann's teeth on edge, if even he does not gnash them at such stupendous ignorance. In the name of the prophet, Fudge, Mr. Zerban, "demonstrator of physics and chemistry"!!

Then we come to three-colour photography. Thus Zerban:

"This is similar to Lippmann's, and was invented by Ducos du Hauron in 1878. Here coloured monochromatic glass screens are interposed, but one plate for each screen, so that three different exposures with as many orthochromatic plates are necessary. For printing, one piece of sensitised paper is used in successive prints, somewhat similar to lithography. This method, too, is complicated, although it gives good results, for great care must be taken not to shift the position of the camera during exposure, or have the plates fit inaccurately on the paper. Mr. Ives, of Philadelphia, has improved this method somewhat, but it is still deficient."

Three-colour photography "similar to Lippmann's!" And "printing on sensitive paper" for "successive prints." Ye gods and little fishes! what next? And next?

We are painfully surprised that such rubbish as this should find its way into the columns of a photographic paper, and be singled out for the distinction of a prize. A feeling of charity towards a *confrère*, whose photographic writings we have more than once perused with pleasure and profit, impels us to hope that the article in question escaped his minute notice as he passed it on to his printers. But, for the self-constituted authority on colour photography, who styles himself a demonstrator of physics and chemistry, we can find no excuse. The ignorance he so severely suffers from can only succumb to the most drastic treatment available, namely, a study of the alphabet of current colour-photography theories. When he has got through that simple lesson we do not envy him his reflections.

So often do we find it our duty to pass unfavourable criticisms upon the ridiculous ideas about colour photography that are published in the press that at times we possibly run the risk of wearying the reader. But in this case we feel no apology is due or needed. The vehicle for the arrant rubbish to which we have called attention is a photographic paper—not a mere general newspaper of whose stock in trade ignorance of scientific subjects is cheerfully allowed to form a part—but a photographic paper, which should guard its readers against quackery. And again, if we have allowed Mr. Zerban to tell our readers, in his amusing way, what the Lippmann and Ives systems of colour photography are not, the negative knowledge so obtained may not improbably be of an informative character to many who like himself have no clear ideas on the subject. Such knowledge may thus ultimately pave the way towards a tolerable understanding of what those beautiful processes really and truly are, so that, after all, it is to be hoped that Mr. Zerban will not have written his prize masterpiece in vain, and that our action in directing public attention to it will not be without advantage.



## OZOTYPE AND MARIOTYPE.

It will be remembered that, in the last Exhibition of the Royal Photographic Society, some half a dozen pictures were shown by Mr. Thomas Manly as examples of "ozotype printing in pigments." No particulars of the process by which they were produced were given beyond what appeared in the catalogue, which was, "Carbon printing without actinometer, transfer, or safe-edge, and in which the pigmented gelatine does not come in contact with a chromic salt." There was some little speculation at the time as to what the process was, and the opinions we heard generally expressed by several was that it was probably somewhat akin to the Mariotype process of a quarter of a century ago. Mr. Manly has protected his method by a patent, the specification of which and the claims it contains was published in our issue of the 31st. ult.

At the last Technical meeting of the Royal Photographic Society Mr. Manly read a paper on, and gave a demonstration of, the working of "ozotype," a brief report of which we gave last week.

From the specification and the report it will be seen that ozotype is somewhat closely analogous to Mariotype, inasmuch as it is based upon the property that an exposed film of bichromated gelatine has of communicating the light's action to another film of gelatine that has not been exposed to it at all. In order that our readers may the better understand the two processes and the difference between them, we briefly describe them, taking the older of the two methods first.

Mariotype was first brought before English photographers by M. A. Marion, in a paper read before the London Photographic Society (now the Royal) on May 13, 1873, which will be found in full on page 242 of our volume for that year. It had, however, shortly before been brought before the French Photographic Society. There are two methods of M. Marion, "Mariotype by contact," and "Mariotype by pressure," though both are based upon the same principle. It is the former that we shall describe now, inasmuch as it is that to which ozotype is the most closely allied in practice.

The ordinary single-transfer paper, as used in carbon printing, is sensitised, instead of the tissue, on a six per cent. solution of bichromate of potash, to which a little sulphuric acid has been added, and dried. It is then exposed under the negative. The printing can be watched in the same way as in silver printing, the image being a visible one of a brown colour on a pale yellow ground. When printed, the paper, with a piece of ordinary unsensitised carbon tissue, of any desired colour, are immersed in a two per cent. solution of bichromate of potash, and then squeezed together in the usual method of working the carbon process. The mounted tissue is then placed, while in the moist condition, under slight pressure for eight or ten hours. Under these conditions the continuation of the light's action goes on, by transmission, to the unexposed tissue. At the end of the eight or ten hours the print is put into the warm water, and developed just as if it were an ordinary single-transfer picture. When dried, the work is complete and we then have a non-reversed picture without transfer. No actinometer is required for timing the printing, and no safe-edge is necessary. Such is Mariotype by contact.

The manipulations in ozotype are these: Single-transfer paper is sensitised in a solution of bichromate of potash, to which sulphate of manganese has been added, and dried. It is

then printed under the negative, the image, as in Mariotype, being a visible one. It is next washed, to get rid of the unacted-upon salts, and again dried. Then a piece of ordinary unsensitised carbon tissue, together with the print, are immersed in a bath, consisting of water, 1000 parts; glacial acetic acid, 2 to 5 parts; and hydroquinone,  $\frac{1}{2}$  to 2 parts, and the two squeezed in contact and once more dried. Afterwards the print is soaked for half an hour or so in cold water. It is then developed in warm water, as in the ordinary method of carbon printing, and, when dry, the print is completed.

In Mariotype, sulphuric acid is added to the bichromate sensitising solution; in ozotype, sulphate of manganese. For mounting the tissue on the print in the former process a plain, dilute solution of bichromate of potash is used, in the latter a dilute acid solution of hydroquinone is employed. Except for the washing out of the unacted-upon salts in the latter process and the two dryings, the manipulations are precisely similar, though it will be seen that Mariotype by contact is the simpler of the two. The separate and distinct operations involved in the ozotype process are just about the same as those pertaining to the ordinary double-transfer carbon process, and the time, from beginning to end, in which a print can be completed by either of these processes is much about the same in the end.

There is no question that the ozotype process is an exceedingly interesting one, like Mariotype, and no doubt many experimentalists are trying it, for we understand that, though patented, Mr. Manly throws no obstacle in the way of those who wish to experiment with it.

Whether this process will ultimately supersede the usual method of commercial carbon printing, of course, remains to be seen, but much will naturally depend upon the quality of the results it is capable of yielding; the operations, as we have said, in ozotype are about the same as in the usual double-transfer carbon process, and more than those in the single-transfer or the Mariotype processes.

It may well be asked why the Mariotype processes have so long remained in abeyance and are almost forgotten. Such, however, has been the case with other processes that have been resuscitated and brought into practice. Pouncy's gum-bichromate process is a case in point. At the time M. Marion made his process public comparatively little interest was taken in carbon printing, either by amateurs or professionals, except by a few large firms, and it was then hampered by patent rights; therefore it attracted but little attention at that period and passed almost into oblivion.

Space will not allow us here to enter into the second process of M. Marion, "Mariotype by pressure," though it is quite as interesting as the one we have so briefly described.

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**Municipal Installation of Acetylene.**—It is increasingly evident that, as we have before pointed out, Continental authorities do not evince the dread of this fell agent that fire insurance companies show in this country, for we read that an installation of this gas under municipal auspices has just been laid down at Schonsee in Prussia. This is the first installation laid down by authority, but it is being followed by one in Oliva, near Dantzig. We await with interest the accounts of the practical working of acetylene on a large scale, and, with some curiosity, the possible effect these public virtual recognitions of its safety will have upon the British fire offices.



**Photography and Eclipses.**—In view of the solar eclipse next year, for which active preparations are already in progress, an important discussion of photographic methods took place at the fifth ordinary meeting of the British Astronomical Association on the 29th ult. It is evident that the actual results obtained at the eclipse were far from being as satisfactory as would have been liked. Mr. Maunder read a paper on "The proper Exposure to be given for Photographs of the Corona," and in it he commented upon the extraordinary variations in the exposures given when taking the corona. He divides the photographs to be made into four classes, according to the region in which it is desired to obtain to perfection in the negatives, and with rapid plates, assuming the telescopes to act at  $f$ -15, he gives from  $\frac{1}{80}$  to  $\frac{1}{2}$  or even  $\frac{1}{4}$  second as the exposure time, one second almost marking the limit of really useful exposure, though if the long rays alone are wished for a 100 seconds may be given, the inner portion then being naturally "burnt up." Now, it is perfectly evident to any practical photographer that no amount of the "skilful development" referred to will enable the astronomer, on one and the same plate, to obtain really useful negatives of the whole area of an illuminated object the intensity of light radiated from which varies at different positions from one to eight thousand. Two ways can be devised for overcoming the difficulty. First, the coronal rays must be divided into zonal regions and the exposure selected for each particular region, the more brightly illuminated parts to be absolutely cut off with an opaque screen. Second, a glass interceptor might be devised and placed in front of the plate, and so stained or obscured in a graduated manner as to reduce the various intensities to a common value.

It may be further pointed out that no practical photographer, desiring to take faintly luminous objects such as the outer portions of the corona, would for one moment, if he could avoid it, include on the same plate and in immediate proximity to the faint illumination, another object intensely brilliantly lighted; a combination of halation and atmospheric light convection, if we may coin the expression, would tend to destroy the greater part of the possible clearness and crispness of representation looked for in a good negative.

MR. THWAITES gave his experience, which does not seem to accord with usual photographic practice. Using ordinary plates, he yet found it desirable to develop on the spot, as the plates quickly deteriorated. Again, he quoted Lord Crawford's experience given at a meeting of the Royal Astronomical Society; he took 600 negatives in countries ranging through the south of India, the Malay Peninsula, Singapore, and the coast of Borneo, and of those developed at home ninety per cent. were failures. It surely is not possible that the plates were not sealed in air-tight receptacles, yet, if such precaution were taken, it is difficult to understand the failures. Films are usually considered more liable than plates to be influenced by external causes, yet we may say we lately developed some films comprising exposures in the Mediterranean, Suez Canal, and India, all the films having travelled through this hot area, which gave perfect negatives. The films were enclosed in tin cases, the lids being sealed simply with strips of the well-known indiarubber plaster.

**Saturn's Ninth Satellite.**—This astral body, which we recently described as having been discovered entirely through photographic agency, was found on a negative taken at the Harvard Observatory at Arequipa, the telescope used being the twenty-four-inch one lately presented by Miss Catherine Bruce. The instrument, as we know, is a specially rapid one for its class, working at  $f$ -6. The four plates taken had an exposure of only two hours. None but a most powerful instrument could have picked up an object of such slight magnitude as this satellite must be. The discovery is an undoubted triumph for photography.

**Uranium Radiation.**—In a note presented to the last meeting of the French Academy of Sciences, M. Henri Becquerel describes some of his latest experiments on this subject, showing

the virtually perpetual nature of the radiations. He states that, as estimated by their action upon photographically sensitive media, the radiations given off by uranium appear to persist indefinitely in their original intensity. In May 1896, he enclosed a portion of this substance in a leaden box, thus shutting it off from any source of radiation known to science at the present time, yet the uranium appeared to exert just the same action as it did when first experimented with, before being enclosed. In two early experiments he made he appeared to discover a polarisation of the rays, but this he now entirely fails to reproduce. He notes that bodies such as glass, exposed to these rays, give off a secondary radiation similar in nature to that described by M. Sagnac as happening with X-rays.

## AN APPLICATION OF THE DIFFRACTION-GRATING TO COLOUR PHOTOGRAPHY.

[Reprinted from the *Philosophical Magazine*.]

If a diffraction-grating of moderate dispersion and a lens be placed in the path of a beam of light coming from a linear source, and the eye be placed in any one of the spectra formed to the right and left of the central image, the entire surface of the grating will appear illuminated with light of a colour depending on the part of the spectrum in which the eye is placed. If one part of the grating has a different spacing from the rest, the spectrum formed by this part will be displaced relatively to the first, and, if the eye be placed in the overlapping part of the two spectra, the corresponding portions of the grating will appear illuminated in different colours. This principle I made use of in the development of a new method for producing photographs in natural colour. I have eliminated the use of pigments and coloured screens entirely in the finished picture, the photograph being nothing more nor less than a diffraction-grating of variable spacing, the width between the lines in the different parts of the picture being such as to cause them to appear illuminated in their proper colours when viewed in the manner described.

We will take at the start three diffraction-gratings of such spacing that the deviation of the red of the first is the same as that of the green of the second and the blue of the third (the red, green, and blue in question being of the tints of the primary colours of the Young-Helmholtz theory of colour vision). If these three gratings be mounted side by side in front of a lens, their spectra will overlap, and an eye placed in the proper position will see the first grating red, the second green, and the third blue. If the first and second be made to overlap, this portion will send both red and green light to the eye, and will in consequence appear yellow. If all three be made to overlap in any place, this place will send red, green, and blue light to the eye, and will appear white.

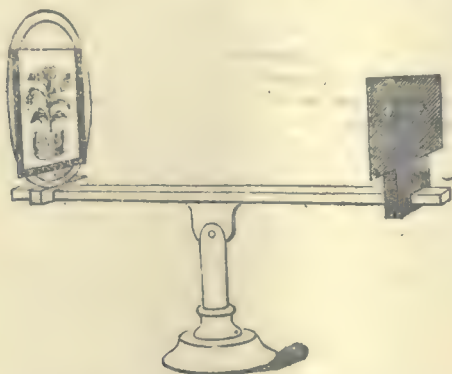
The method that I first employed to produce photographs showing natural colours on this principle is the following: Three negatives were taken through red, green, and blue screens in the usual manner; from these positives were made on ordinary lantern slides (albumen slides are necessary for reasons which I will speak of presently). The positives, when dry, were flowed with bichromated gelatine, and dried in subdued light. The three diffraction-gratings of proper spacing, ruled or photographed on glass, were placed over these positives, and exposed to the sun or electric light for thirty seconds. On washing these plates in warm water, diffraction-gratings of great brilliancy were formed directly on the surface of the film. Albumen plates must be used, since the warm water softens and dissolves a gelatine film. Three sheets of thin glass, sensitised with the bichromated gelatine, were placed under the three positives, and prints taken from them. The portions of each plate on which the light had acted bore the impression of the corresponding diffraction-grating, strongly or feebly impressed, according to the density of the different parts of the positives. These three plates, when superimposed and placed in front of a lens, and illuminated by a narrow source of light, appear as a correctly coloured picture when viewed with the eye placed in the proper position. Perfect registration of the different parts of the picture could not be obtained in this way, for obvious reasons. I worked for a while with the thin glass from which covers for microscopical



slides are made. This gave much better results, but was too fragile for practical purposes. It then occurred to me that, if I could get the entire grating system on a single film, not only would the difficulty about perfect registration vanish, but the pictures could be reproduced by simple contact printing on chrom-gelatine plates as easily as blue prints are made. I was surprised to find that successive exposures of the same plate under the positives, perfect registration being secured by marks on the plates, produced the desired result. On washing this plate in warm water and drying, it becomes the finished coloured photograph. Where the reds occur in the original, the spacing of the first grating is present; where the yellows occur, the spacing of both the first and second are to be found superimposed; where the blues occur are the lines of the third grating; while in the white parts of the picture all three spacings are present. It seems almost incredible that, by exposing the plate in succession under two gratings, the spacings of both should be impressed (superimposed) in such a manner as to give the colours of each in equal intensity; but such is the fact. Thus far I have had at my disposal but two gratings of only approximately the right spacing, one giving the red, the other the green; with these I have photographed stained-glass windows, birds, and butterflies, and other still-life objects, the finished pictures showing reds, yellows, and greens in a most beautiful manner. By making a separate plate from the blue positive, using the same spacing as with the green, and setting this plate behind the other at an angle, I have obtained the blues and whites, the grating space being diminished by foreshortening, though, of course, perfect registration of the different portions of the picture could not be obtained.

One of the great advantages of this method is the facility with which duplicates can be made. If we place the finished picture in a printing frame over a glass plate coated with bichromated gelatine, and expose it to sunlight, on washing the plate in warm water we obtain, by a single printing process, a second colour photograph, equal to the first in every respect, and also positive. From this second copy we can print others, all being positive.

The apparatus for viewing the pictures consists of a cheap double-convex lens mounted on a little frame, as shown in fig. 1, with a



perforated screen for bringing the eye into the right position. I find that, by using a lens of proper focus, it is possible to so adjust the apparatus that the picture can be seen in its natural colours with both eyes simultaneously, since corresponding overlapping spectra are formed on each side of the central direct image. A gas flame turned edgewise, or the filament of an incandescent light, make a convenient source of light. The colours are of great brilliancy and purity, almost too brilliant in fact, though dark reds and ochres are reproduced with considerable fidelity. The pictures can be projected by employing a powerful arc light, placing a rather wide slit in the overlapping spectra and mounting the projecting lens beyond this. The pictures that I have obtained thus far measure 2.5 inches by 2.5 inches, and have been thrown up about 3 feet square. The fact that only a small percentage of the light is utilised makes great amplification difficult. Certain experiments that I have made lead me to believe that the process can be greatly simplified.

I have exposed an ordinary photographic plate in a camera under

a diffraction-grating placed in front of, and in contact with, the film. On development, we obtain a negative, the dark portions of which are broken up into fine lines, corresponding to the lines of the grating; and, on viewing this in the apparatus just described, the blue components of the picture are seen, though not so brilliant as with the transparent gelatine plate, owing to the coarseness of the grain.

I believe that, by the use of a suitable photographic plate, to be exposed in succession in the camera under red, green, and blue screens, on the surfaces of which suitable diffraction gratings have been photographed, it will be possible to obtain the colour photograph directly. The screens can be swung into position in succession by a suitable mechanical arrangement operated outside of the camera. The plate, on development, will be a negative, in the ordinary sense of the term, though, when seen in the viewing apparatus, it will appear as a coloured positive, since, on the transparent portions which correspond to black in the original, no grating lines have been impressed; consequently these portions will appear dark. The dark portions, however, where the lines are impressed, will light up in their appropriate colours. From this plate as many copies as are desired can be made by contact printing on bichromated gelatine.

Of course, it is a question whether superimposed gratings can be impressed on a plate in this manner. Judging from the experiments I have made, I imagine that the gratings on the colour screens would have to be made with the opaque portions broad in proportion to the transparent.

I have overcome the difficulty of obtaining large diffraction-gratings by building up photographic copies in the following manner. The original grating ruled on glass was mounted against a rectangular aperture in a vertical screen, the lines of the grating being horizontal. Immediately below this was placed a long piece of heavy plate glass, supported on a slab of slate to avoid possible flexure. A strip of glass, a little wider than the grating, sensitised with bichromated gelatine, was placed in contact with the lines of the grating, and held in position by a brass spring. The lower edge of the strip rested upon the glass plate, so that it could be advanced parallel to the lines of the grating, and successive impressions taken by means of light coming through the rectangular aperture. In this way I secured a long narrow grating, and by mounting this against a vertical rectangular aperture, and advancing a second sensitised plate across it in precisely the same manner, I obtained a square grating of twenty-five times the area of the original. It was in this manner that I prepared the grating used to print the impressions on the three positives. So well did they perform, that it seemed as if it might be possible in this way to build up satisfactory gratings of large size for spectroscopic work. Starting with a one-inch grating of 2000 lines, I have built up a grating eight inches square, which, when placed over the object-glass of a telescope, showed the dark bands in the spectrum of Sirius with great distinctness. No especial precautions, other than the use of the flat glass plate, were taken to ensure absolute parallelism of the lines, and I have not had time to thoroughly test the grating. The spectra, however, are of extraordinary brilliancy, and, on the whole, the field seems promising. This matter will, however, be deferred to a subsequent paper.

PROFESSOR R. W. WOOD.

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#### AMMONIUM PERSULPHATE—ITS PROPERTIES AND USES.

The general interest which has been aroused by the introduction of this salt is excuse, if one be required, for this translation of Herr Pizzighelli's abstract of a lengthy paper by Professor Namias, who is well known for his numerous writings on photographic matters.

Namias's researches have led him to the following conclusions:—

1. Ammonium persulphate has been recommended for some years, under the name of anthion, as a hypo-eliminators, and to shorten the process of washing,\* its action being the conversion of the thiosulphate into tetrathionate. It was, however, not much used, as, like most other

\* This statement is not quite correct, anthion being the potassium persulphate. — Trans.



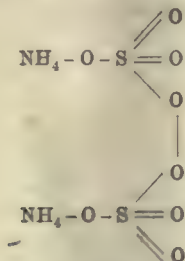
eliminators, it also attacked the image. The best hypo-eliminator is still running water, the only exception possible being hydrogen peroxide, which has been repeatedly recommended when it is absolutely necessary to shorten the duration of washing.

2. The applicability of this salt for the reduction of negatives, first discovered by Lumière and Seyewitz,\* cannot be too highly esteemed, as it reduces the high lights, and hardly attacks the half-tones and shadows. There had not been known hitherto any reducer which would thus give harmonious results from harsh negatives; the only process, which, however, was more troublesome, was the chlorising or bromising of the image with cupric chloride or acid bichromate and bromide, and partial development.

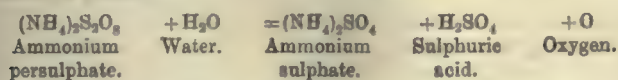
3. According to Namias, the method suggested by the discoverers is the best, namely, the immersion of the negative in a five per cent. solution of ammonium persulphate, when, after five to ten minutes' action, a more or less lowering of the contrasts was obtained, as the solution acted first upon the high lights and afterwards on the half-tones and shadows. A subsequent washing completes the operation. If, however, it is desirable to stop an after-reduction during washing, it is advisable to immerse the negative in a ten per cent. solution of sodium sulphite, which converts the persulphate into sulphate, which does not act on the silver.

4. Namias cannot agree with Lumière and Seyewitz's theory of the action; but, before entering upon this, he comments on the salt and its properties.

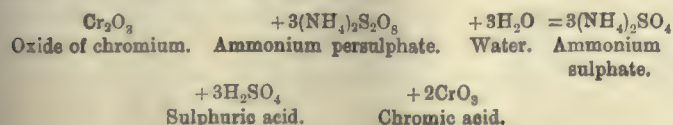
Ammonium persulphate is obtained by neutralising persulphuric acid, which is obtained by the action of an electric current on normal sulphuric acid, or by direct electrolysis of a saturated solution of ammonium sulphate. It forms a white crystalline powder, readily soluble in water (one part of the salt, two parts water). When dissolved it fizzes, perhaps the result of the evolution of oxygen. Its chemical formula is generally stated as  $\text{NH}_4\text{SO}_4$ ; to be accurate, it should be written  $(\text{NH}_4)_2\text{S}_2\text{O}_8$  or—



Persulphuric acid and the persulphates have an energetic oxidising power, and, in the presence of a substance which can combine with oxygen, they decompose water and are converted into sulphuric acid or a sulphate, combining with the hydrogen, and set free the oxygen. Their oxidising action is not, therefore, direct, but indirect, and may be expressed as follows:—

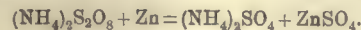


Ferrous salts are converted into ferric, sodium thiosulphate into tetrathionate, chromous into chromic acid or chromates. This last action, discovered by Namias, may be of some importance for many photographic processes, and is as follows:—

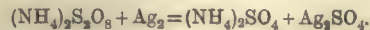


That is to say, one molecule of chromous salt requires three molecules of persulphate in order to be converted into chromic. This can be easily verified by mixing a ten per cent. solution of chrome alum with plenty of persulphate, when, after some hours, the solution becomes completely yellow, and the chromic acid formed can be converted, by addition of ammonia, into chromate or bichromate; a slight addition of sulphuric acid hastens the reaction. This could be used in chemical analysis for the estimation of chromium.

5. Ammonium persulphate possesses, beyond its oxidising action, also another very interesting property, that of dissolving certain metals, such as zinc, aluminium, and iron, &c. This peculiar property of a neutral salt, which at first sight appears wonderful, can be explained, in that, by substitution of an atom of a metal in the molecule of the persulphate, a sulphate is formed. With zinc, for instance, the following equation expresses the reaction:—

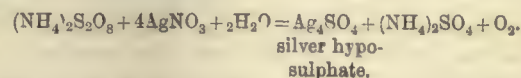


With silver:—



6. Another peculiar property of this salt, which was discovered by Lumière and Seyewitz, is its power of reducing silver salts. They held that the grey substance which is formed when a solution of ammonium persulphate is allowed to act on a solution of silver nitrate was metallic silver, and tried to explain by this the fact why the persulphate acted from within and not from the outside of the photographic film.

Namias tried and found that, whilst there was a reducing action, it never reached the stage of forming metallic silver, but only a dark grey compound, which ought to be considered as more or less a basic subsulphate of silver. The formation of this compound is accompanied by the evolution of oxygen, and therefore one may assume that the equation is



it is not impossible that a more basic subsulphate compound forms, but never metallic silver.

The greyish-black precipitate dissolves completely and quickly in hyposulphite, and also sulphite of soda, without residue, which obviously could not be the case were it metallic silver. When boiled in water, sulphur is precipitated, and it is converted into a lower basic subsulphate, which, however, is still soluble in hypo. This last fact completely excludes the hypothesis, which also on other grounds is not feasible, that a mixture of metallic silver and silver persulphate is formed, in consequence of which, and by the action of the persulphate, the metallic silver dissolves in hypo.

If a very small quantity of silver nitrate is added to a solution of ammonium persulphate, there is no precipitate, but, by continued addition, a point arrives when precipitation commences. This proves, therefore, that a strong excess of the persulphate stops the reaction. The reaction is in any case incomplete, but takes place, however, the more quickly and the more completely the greater the excess of silver nitrate.

Namias tried to analyse the precipitate, so as to estimate the amount of sulphuric acid and silver that it contained, but, by washing it with water on the filter for a long time, silver sulphate was dissolved, so that finally there was another compound to that at the beginning. It may be assumed that the composition of the compound alters when the conditions under which its precipitation takes place are changed; according to circumstances, a compound more or less rich in silver may be obtained.

7. Whatever may be the composition of the compound, one thing is certain, and that is that the explanation of the action of the persulphate, which was based by Lumière and Seyewitz on the formation of metallic silver, falls to the ground. They held that in the interior of the image-bearing film a soluble silver salt was formed by the action of the persulphate on the silver, which salt diffused in the solution, whilst on the surface the silver salt that was formed was again reduced to metallic silver by the excess of the persulphate; the tendency to this latter reaction necessarily limits the former.

Namias now remarks that the existence of a large excess of persulphate must only result in the solution of chloride, which can only form in small quantities on the surface of the film, since, as has been shown elsewhere, the persulphate in strong excess has no continued action on a small quantity of silver salt.

We must thus assume that either the persulphate penetrates only in very small quantities into the film, or, having penetrated, could reduce it.

This would explain in any case why no great excess of the persulphate could be on the surface of the film. Assuming this, the author believes that one of the causes why the persulphate has such a small action on the surface of the film may possibly be that subsulphate of silver is deposited on the silver particles on the surface, and they are thus protected from further action. In the interior of the film, on the other hand, where the excess of persulphate necessary for the decomposition of the

\* The solvent action of this salt on the silver image was first pointed out by R. E. Liesegang.—Trans.



silver sulphate first formed is not present, the reaction may easily take place.

In the interior of the film there always remains a small quantity of the silver salt, which should be eliminated by the use of a bath of sodium sulphite. The bath makes, as already mentioned, the persulphate, which is left behind, and which would continue to act harmless.

(To be continued.)

### THE APPLICATION OF THE DIFFRACTION-GRATING TO PHOTOCHROMY.\*

A PAPER by Mr. R. W. Wood, in the *Philosophical Magazine* for April 1899,† reminded me of a principle which might possibly be made use of in direct photochromy. The application of this principle occurred to me many months ago—certainly before June 1898.‡ Mr. Wood's method, as described in his paper, is "indirect," or "composite." The use of the gratings is only subsidiary, i.e. for illuminating purposes, and the original use of three-coloured screens is necessary.

The obligation to use colour screens in order to separate the primary colours, so that each may be treated separately, makes a process a composite one.§ In a direct process coloured light itself exerts an action upon the sensitive medium, which is different from that exerted by light of another colour. The earliest satisfactory experiments on photochromy (those of Seebeck, followed up by Herschel, Hunt, Bequerel, Poitevin, and others) probably relied to a great extent for their effect on interference phenomena|| of the same nature as those at which Lord Rayleigh arrived theoretically, and Lippmann experimentally.

The fundamental point upon which any process of direct photochromy must depend is the substitution of position of substance in the film for colour; each colour must be capable of producing such a modification in the film as may be preserved by after-processes, such as development (i.e. changes in the mode of deposit, that is, the position of particles). In Lippmann's process the only physical property that distinguishes rays of different colours—wave-length—was taken advantage of, and by this well-known method layers were formed in the film which corresponded to the wave-length of the light impressing the film at that point. Thus we see that position of the silver particles is substituted for the impressing colour in Lippmann's method.

Provided that there is no means of producing permanent photochromes by the direct chemical action of light, which of course cannot be said to be impossible, though it is highly improbable, it is necessary to take advantage of the wave-length of light for a direct process. If no direct pigmentary process is used, the photograph must remain monochromatic in the sense of not exerting any selective absorption on the rays of light, and hence the resultant colours, if they depend on wave-length, must be produced by position, corresponding to wave-length, of the particles forming the photographic image.

We have seen that Lippmann's process is one method of effecting this, a *réseau à profondeur* is formed of silver layers in the transparent film. From these considerations it occurred to me to inquire whether there could be any other "method of position" depending on similar, the only possible, considerations.

It is well known that, when monochromatic light passes through a narrow slit in an opaque screen, it is diffracted, and, if the diffracted light is received on a white screen or viewed through a small telescope,¶ a band of light of that colour is seen, and right and left of it a series of similar bands, gradually diminishing in brightness and separated by dark bands.

The breadth and closeness of these bands are functions of the wave-length; the bands are narrower and nearer together the shorter the wave-length.

\* I have used the term "photochromy" as being more general in meaning than "heliochromy."

† "An Application of the Diffraction-grating to Colour Photography."—*Phil. Mag.* [5], xlvii. 366-373, 1 fig.

‡ I believe the use of a diffraction-grating occurred to me after some correspondence with Dr. Joly, of Dublin, on a certain modification of his method. The modification depended on the use of a coarse grating, but did not depend upon diffraction. The connexion was a slight one, depending on the word "grating." The behaviour of coloured light when passed through a slit immediately suggested itself, and the connexion between the bands and the notion that I had previously formed of the foundation of direct photochromy—the substitution of position of the deposit for colour—then appeared (see below).

§ I do not by any means intend to say that the use of a coloured screen, *per se*, makes the process a composite one, even when the screen or screens are necessary for viewing the object in colour, but that a process is composite when it depends on a theory of colour vision. This point will be dealt with subsequently.

¶ This, apparently, was the view of Zenker (*Lehrb. de Photochromie*, 1868), and the independent view of Lord Rayleigh (*Phil. Mag.* 1887).

¶ If the aperture is very small, the diffraction figure may be viewed by the eye alone.

If the screen is replaced by a photographic plate, there will be, on development, bands of deposit whose breadth and closeness depend on the light used—in other words, position of the particles in the film takes the place of the original colour.

Now, if a coloured image is formed by a lens on a plate and a grating interposed a short distance in front of the plate, the image will be split up into minute bands corresponding to the wave-length at any point. In fact, new gratings whose "rulings" correspond to the colours at the various points of the picture would apparently be formed. In this case the picture, placed in front of a biconvex lens illuminated by a narrow source of light, and viewed in the proper position, would appear in natural colours.

The process will shortly, I hope, be under experimental trial.

In this paper the view of direct photochromy taken is different from that of Captain Abney. Captain Abney would only call a photochrome "direct" if its colour was due to pigments, that is, if it depended on absorption. This removes from the category of "direct" processes those based on interference or diffraction, but would, apparently, include such a process as that of Graby.\*

A more fundamental classification of processes is into those which depend on the preliminary and artificial separation of the impressing colours, such as the different applications of Clerk-Maxwell's idea, and those which do not, i.e., those which do not depend upon any particular theory of colour vision. The former composite process is certainly indirect; the latter is direct in the sense of all colours being treated by one process on one plate. Graby's pigment process is then more indirect than Lippmann's. Furthermore, that colours produced by absorption have any more objective reality than those produced by interference, is, physically speaking, a delusion. It is easy to see how this mistaken notion arose, but that it should form the basis, as it does for some people, of a classification of photochromic methods is absurd. The further consideration, however, of the fundamental principles of photochromy and their bearing on the classification of different processes is left for another communication.

PHILIP E. BERTRAND JOURDAIN.

### A CHEAP SUBSTITUTE FOR PLATINOTYPE.

THE following abstract of a paper by Herr Vollenbruch, which appears in the *Deutsche Photographen Zeitung* may be useful to those who wish to experiment with a cheaper paper, which according to the author is specially suitable for subjects with deep blacks, as it will give vigorous prints full of detail even from flat negatives.

The raw paper, which should be pure, is first immersed for two minutes in the following bath, which should be warmed:—

Distilled water.....	1000 parts.
Ordinary gelatine .....	5 "
Citric acid.....	3 "
Chrome alum solution (1 : 20) .....	50 "
† Aluminium solution.....	7 "

After immersion the paper should be hung up to dry.

The sensitising solutions are:—

No. 1.	
Distilled water .....	100 parts.
Gelatine .....	0.5 "
Salicylic acid .....	0.05 "

No. 2.	
Distilled water .....	100 parts.
Green ammonio-citrate of iron.....	20 "

No. 3.	
Distilled water .....	80 parts.
Silver nitrate.....	10 "

No. 4.	
Distilled water .....	100 parts.
Uranium nitrate.....	20 "

According to the proportions of these solutions the results differ, more silver gives soft prints and more iron hard prints. Reduction of uranium gives browner, and increase gives more blue-black tones. The following proportions gives the best results with a normal portrait

\* Briefly described in the *Photogram* for February 1897.

† This solution is made by dissolving 3 parts of aluminium in a mixture of pure nitric acid 18 parts, water 18 parts, and when dissolved sufficient water should be added to make 140 parts in all.



negative, and the tone of the picture is a greyish-black, which cannot be distinguished from platinotype :—

No. 1 .....	2 parts.
" 2 .....	2 "
" 3 .....	4 "
" 4 .....	4 "

The solutions must be mixed in the above order, or else the mixture will be cloudy. The solution should be poured on to the paper and then distributed with a pad of cotton-wool or round brush, and the marks evened out with a softener. The paper must be quickly and evenly dried, and will then keep for four days if protected from light and damp, but it is better to use it fresh.

The paper must be prepared and manipulated in yellow light. The paper should be exposed till the half-tones are faintly visible, and then immersed in the following developer :—

Distilled water.....	700 parts.
Ferrous sulphate.....	30 "
Acetic acid .....	10 "

When sufficiently developed, the print should be placed in a clearing bath of one per cent. solution of nitric acid for three minutes, and then immersed in the following fixing bath :—

Water .....	1000 parts.
Hypo .....	180 "
Sodium sulphite .....	25 "
Sulphuric acid ..	3 "

The hypo and the sulphite should be first dissolved, and then the sulphuric acid slowly added, with constant stirring. As the prints lose considerably in printing, they must be considerably over-developed.

For those who prefer to work with a real instead of an imitation platinotype, the following notes for the preparation of such papers may be useful. The raw paper is, as is well known and has been frequently described, given a preliminary sizing with arrowroot or gelatine. Such paper can be obtained commercially. If it is desired to make this oneself, which is not worth while unless a large quantity is used, the following formulae should be used :—

#### I.—GELATINE SIZING.

Take of a good, soft gelatine 42 parts, and allow to soak in 6000 parts of soft water, then heat to 60° C., and stir well till the gelatine is dissolved, and then allow to cool. Dissolve also in 2000 parts of water, alum (potash), 28 parts; oxalic acid, 4 parts; and finally add 1000 parts of ninety-six per cent. alcohol. Mix the two solutions and pour into a big dish while still warm. In this solution the sheets of paper should be immersed and allowed to remain for three minutes, and then hung up to dry. When thoroughly dry, the sheet should be again immersed for three minutes and then hung up from the opposite end to the last time.

#### II.—ARROWROOT SIZING.

Rub up 15 parts of arrowroot in 100 parts of water, and then pour it into 500 parts of boiling water, and add the part of previously swollen gelatine. The solution should be allowed to cool, and the sheet tacked on to a board, and then coated evenly with the mixture, and then hung up to dry. When dry, the operation should be repeated, and the paper hung up to dry from the opposite end, as suggested above.

#### THE SENSITISING SOLUTIONS.

##### (a) Iron Solution.

Dissolve 20 parts of ferric oxalate in 80 parts of distilled water; when dissolved, filter and add 0.8 parts of lead oxalate; shake till dissolved, and add 2 parts of oxalic acid.

##### (b) Platinum Solution.

Dissolve 10 parts of chloro-platinite of potash by the aid of heat in 60 parts of distilled water.

##### (c) Chrome Solution.

Bichromate of potash.....	1 part.
Distilled water.....	50 parts.

For blue-black tones for a normal negative take

Solution a .....	6 c. c.
Solution b .....	4 c. c.

For flat negatives, add from one to ten per cent. of solution c. If brown pictures are required, add to the above quantity 6 to 8 drops of a five per cent. solution of mercuric chloride.

The solution is now spread on a sheet of paper, and evened out by a badger's-hair softener, and quickly dried. The dry paper must be kept in a calcium tube. The further treatment of the paper is well known.

#### WIDE-ANGLE PHOTOGRAPHY IN ASTRONOMY.

To the pages of our contemporary, *Knowledge*, for April, Mr. E. Walter Maunder, F.R.A.S., contributes a very interesting article on the above subject. He points out that one of the first results of the great scheme of an international photographic survey of the entire sky was a rather curious one. There was a sensible diminution in astronomical activity, at any rate in England, apart from the more or less routine work carried on by the great public observatories. This would seem to have resulted from a vague, unspoken, yet powerful impression that the great photographic revolution which was in progress had rendered the older methods of observation more or less obsolete, and in particular had doomed the amateur astronomer to uselessness and extinction.

In all probability, no one man ever formulated this impression into a categorical statement, but for a time it certainly had its effect. Nor was it without some plausibility, for it was a new thing to see an astronomical enterprise set on foot of so gigantic a nature that no single observatory, however fully equipped and richly endowed, could hope to deal with it. Nothing less than the association of something like a score of the largest observatories in the world could cope with it.

The discouragement did not last long, and there were some who never felt it. Dr. Isaac Roberts, for instance, was very quick to realise that the international scheme had by no means annexed the whole of the photographic universe, and he promptly carved out a territory for himself, which he has developed with a thoroughness and a success which requires no setting forth to the readers of *Knowledge*, who have had the privilege of studying so many of his wonderful revelations of world systems in the making.

Here, then, are two great photographic surveys with entirely different objects, carried out by very dissimilar instruments, but both carried out so effectively as to render any thought of competition quite out of the question, save to extend Dr. Roberts's cluster and nebular studies to the Southern Pole.

Do these two great schemes cover the whole of possible photographic research? It might almost appear that with some astronomers there had been a feeling that this was indeed the case. If so, others have not been wanting who have been most active in opening out new lines of work.

Among the pioneers of new photographic enterprise two names are pre-eminent, those of Professor Barnard and Professor Pickering. The impetus which the former has given to the use of the portrait lens in astronomical photography is well known, whilst the latter has been especially fertile in devising new departments of work and new forms of telescopes to carry them out. The present number of *Knowledge*, for instance, has an article from him on the use of photographic telescopes of extremely long focus. But we would now specially refer to the recognition by Professor Pickering of the necessity, not only for one great survey of the sky, carried out once, and once for all, but for surveys made in a short time and repeated at frequent intervals. Such surveys are useful for several purposes. The detection of new planets, of variable stars and Novæ, can only be satisfactorily carried out by schemes of which such frequent surveys form an integral part. Professor Pickering, therefore, early devised an ingenious method by which the same plate might be exposed to many different parts of the sky and record the stars in each region in so distinctive a manner that no confusion need take place between the different images from each.

There are two fields of work in which the necessity for embracing a large area of the sky upon a single plate is even greater than in that of the search for variables or Novæ, and yet in which the device of repeated exposures would be absolutely useless. These are the two departments of the study of general stellar distribution and of meteor observation.

The former subject was one in which Mrs. Maunder took a great interest. It was apparent to her that fields of five or ten degrees in breadth were insufficient for the purpose of dealing with some of the problems of sidereal architecture. Regions much wider must be brought together upon a single plate, and that, too, without serious distortion, if the work was to be carried out in the most effective manner. There did not seem to be any lens in the market meeting this requirement until Mr. Dallmeyer, whose work as a photographic optician is so well known, brought out his Stigmatic lens, covering an unusually wide field. Consequently she applied to Mr. Dallmeyer for one of his lenses, immediately upon their details being published, that is to say, early in 1897. It was with this lens—1½ inches aperture and 9 inches focal length—that the photographs were taken of the solar eclipse of January last year, which appeared in *Knowledge* for May 1898. The lens was, however, not procured for eclipse work, but for the charting of wide sky areas; its employment in eclipse work was incidental only, and a portrait lens would probably have been more effective, since a considerably higher ratio of aperture to focus might have been obtained.

Of the admirable illustration which accompanies the article, Mr. Maunder remarks: The plate may serve to illustrate two of the uses to which a lens of this kind might be put. The field shown is thirty-seven degrees in side, fifty degrees in diagonal, and includes one-thirtieth of the area of the entire sphere. The plate was chosen for reproduction quite at random, and is far from being the best available. Nevertheless, it cannot, I think, be in the least contested that it shows the largest field, by much the largest field, of stars defined throughout that has ever yet been published.



In finally summing up this new departure in stellar photography, Mr. Maunders remarks that it offers the following advantages. Considered merely as photographs of the heavens, a set of forty plates of the same angular field as the one here shown, but of larger scale, would provide a more complete map of the heavens than any we yet possess, in exceedingly small compass and at very little trouble or expense. The scrutiny of such a set of plates would give us the fullest possible development of that method of attack of the great sidereal problem which Herschel first attempted in his gauges. Indeed, a vast amount of information as to sidereal structure would result from the mere inspection of such plates. Their value in the work of discovery is most obvious. The systematic employment of wide field plates at a number of observatories would ensure the record of all asteroids, comets, and Novæ within the limits of magnitude recorded; whilst the ingenious methods which Prof. Pickering has devised will bring about nothing short of a revolution in the discovery of short-period variables and the observation of meteors. Much of this work, too, can be done with lenses of small size, and therefore little cost, and so lies quite within the powers of many owners of small observatories. For instance, two friends situated north and south of the equator respectively might easily, and at a trifling expense, bring out not only a complete chart of the heavens, embracing over a million stars, but might bring out a new edition every year.

#### ROCHDALE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

On Friday afternoon last the first public Exhibition of the Rochdale and District Photographic Society was opened in the large room at the Lyceum, Baillie-street, Rochdale. The exhibits numbered 392, and many of them were decidedly handsome—charming in choice of subject, clear in reproduction, copious in illustration of detail, and highly artistic in finish, mounting, and framing.

Apart from the work entered for competition, there were on view forty-eight photographic pictures lent by members and friends, and several of these were much admired by the Judges. Prominent among them was *On the Beach, Hoylake*, a lovely seascape enlargement by Mr. E. Wilman from a negative taken by Mr. H. Bamford, the Secretary of the Society. This view was labelled, "The Judges wish to express their pleasure in the good work of this exhibit," which is of course quite sufficient to show that it would have been a prize-winner if entered for competition. In this section there were also eight beautiful specimens of hand-camera work in cloud, wave, and landscape studies by Mr. J. F. Spencer. Half a dozen of these pictures, illustrating Blackpool by night, had apparently been taken from the celebrated North Pier in that popular resort. The charming effect of the electric light along the front, round the big wheel, and up the tall tower, and its glittering reflection on the dark, heavily rolling waves were excellently reproduced. Another exhibit which attracted much attention was *Reaping*, shown by Mrs. C. M. Royds, wife of Colonel C. M. Royds, M.P. This would probably be considered a perfect picture were it not for the fact that a long, gaunt, dark tree trunk, cut off at the lower branches in such a weird fashion as to suggest the outline of a galloos, obtrudes itself in the foreground. Mr. F. Greenwood showed a highly interesting collection of views of old local buildings and also four local geological photographs. These latter were taken by Mr. Greenwood for the British Association collection, in association with the geological survey of the British Isles. The loan collection comprised likewise a fine enlargement of a photograph of the scene in the Rochdale Town Hall square on Jubilee Day, 1897, by Mr. A. E. Crowther; some beautifully clear studies of still and animal life, by Mr. G. A. Close; and a finely finished half-dozen local views by Mr. W. Ingham.

#### THE JUDGES' AWARDS.

There were nine prizes offered by the Society, three in each of the three classes open to competitors, and, in awarding these, the Judges (Mr. Gray, of the Rochdale School of Art; Mr. R. M. Jones, and Mr. John Schofield) had considerable difficulty. After prolonged consideration, they placed the winners as follows:—

Landscape, River Scenery, or Seascape.—1, *Evening on the Conway*, Mr. E. Ashworth; 2, *The Old Bridge, Smallshaw*, "Spots" (Mr. Turner); 3, *At Rest*, Mr. E. Willman.

Architecture.—1, *Conway Castle—Inner Gateway*, Mr. J. A. Grindrod; 2, *Inner Gateway, Conway Castle*, Mr. E. Ashworth; 3, *Old Front, Belfield Hall*, Mr. J. A. Grindrod.

Any other Subject.—1, *Animal Studies*, Mr. G. A. Close; 2, Various, Mr. J. S. Johnson; 3, *Flower Studies*, Mr. J. S. Johnson.

In Class I. Mr. Ashworth's successful effort was a remarkably good attempt to illustrate a quickly passing phase of nature, in which sunshine makes a feeble attempt to penetrate a mass of storm clouds. "Spots" view of the old bridge at Smallshaw shows light and shade remarkably well, and its trees suggest more life than can be discovered in the ordinary photograph. *At Rest* is good in foreground, but lacking in distance and sky effects. This entry was closely pressed by Mr. William's *Woodland Solitude*, which was, however, considered the worse for the too prominent appearance of tree foliage at one corner. Two other series—each *Conway Castle*, by Mr. J. A. Grindrod—were spoilt by the sky being simply a plain white patch, absolutely destitute of suggestiveness. The first and second prize-takers in architecture were similar views, the first being superior in perspective and evenness of

shade. In Class III. Mr. Close won his award with a lifelike reproduction of the head of the famous "Harry R." Mr. Abel Fletcher's trotting wonder; Mr. Johnson won the second prize with a picture of juveniles bathing; and the third with an exquisite representation of tulips, narcissi, and daffodils.

On Friday night the Exhibition was formally opened by the Mayor (Councillor Ashworth). There was a fairly large attendance. Mr. Ashworth spoke of the Exhibition in eulogistic terms.

A vote of thanks to the Mayor was passed, on the proposition of Mr. H. Bamford (Secretary), seconded by Mr. Worrall.

During the evening about 200 photographs of American scenery, &c., were thrown upon the screen by means of a powerful oxyhydrogen lantern, managed by Mr. H. Bamford. The views were described by Mr. George Smith.

The Exhibition was reopened on Saturday, when there was a large attendance of the general public. In the evening there was another lantern exhibition, when the Society's prize slides, illustrating a photographic trip down the river Wye, were shown.

#### THE GRAPHIC PHOTOGRAPHIC COMPETITION.

We have been asked to announce that the previous photographic competitions organized by our contemporary, the *Graphic*, have met with such great success, and have attracted so much interest amongst amateur photographers, who sent in many thousand contributions, that the Directors have decided to hold a third competition. There will be thirty-four prizes: First prize, 20*l.*; second prize, 10*l.*; third prize, 5*l.*; fourth prize, 5*l.*; ten Kodak cameras worth 3*l.* 6*s.* each; and twenty Kodak cameras worth 1*l.* 1*s.* each.

The prize photographs will be published in the *Graphic*, together with any others which the Judges think worthy of special mention. The fee of one guinea will be paid for each photograph reproduced, with the exception of the prize photographs. At the last competition a large number of photographs were selected by the Judges for publication and special mention in addition to the prize photographs. The rules are:—

1. No competitor to send in more than six photographs, whether mounted or unmounted.
2. In every case a stamped addressed wrapper must be enclosed for the return of the photographs.
3. Acknowledgment will be made in the *Graphic*, week by week, of all photographs received.
4. Photographs will be received any time up to June 1, 1899.
5. The name and address of the sender, and the title of the subject, should be legibly written on the back of each photograph.
6. Photographs may represent either figures, land or seascapes, animals, architecture, &c.
7. Every endeavour will be made to return unused photographs, but the Manager will not hold himself responsible for loss or damage.
8. All communications to be addressed to the Manager of the *Graphic* Amateur Photographic Competition, 190, Strand, London, W.C.

#### ALPINE CLUB'S EXHIBITION.

UNTIL the 27th inst. an Exhibition of Alpine photographs will be on view at the Club-rooms, 23 Savile-row, W. It is well worth a visit even by those photographers who, like ourselves, sigh in vain for an annual holiday among the crags and peaks of Central Europe. If we remember aright, we have seen two previous exhibitions of work by members of the Alpine Club. Our impression is that photographs of the soot and white-wash kind were by no means inconspicuous on those occasions. Alpine scenery, we should imagine, lends itself peculiarly to the production of photographs having an excessive amount of contrast, especially in the hands of a beginner. But there is little, or nothing, of this sort of thing in the present Exhibition, which is mainly the work of those who may be looked upon as veterans in respect both of photography and Alpine travel.

Some of the photographs are really wonderful examples of the ability of the sensitive plate to record the infinite range and delicacy of gradation which the searching lens discerns in the Alpine snowfields. Of those whose work struck us as being distinguished by an almost flawless technique, we may mention the names of Mr. Clinton T. Dent (quite an old hand), Mrs. E. Main (her ice-crystal studies are strikingly beautiful), Mr. H. Speyer, Mr. Sydney Spencer, and Mr. Edward Whymper, the latter, of course, a past master. Captain Abney is a contributor, and there are some Spitzbergen views by Sir Martin Conway. The familiar names of Loppé and de Dechy are also attached to work.

Alpine photography is evidently a most comprehensive term, for in this Exhibition there are photographs taken in Canada, one at Beachy Head, India, the Caucasus, &c. Messrs. Harrington & Co., of Darjeeling, are responsible for a tele-photographic view of the Himalayas taken from a distance of ninety miles. If we mistake not, this is a record in long-distance photography. Dr. Tempest Anderson has an excellent enlarged view of Mount Vesuvius in eruption—scarcely an Alpine photograph, but, nevertheless, an extremely interesting one. The life that is lived in Alpine and polar regions is here and there shown; and, from whatever point of view the Exhibition is regarded, it must be conceded that it is full of fascination to the photographer as well as to the Alpine tourist.



## JUDGES FOR THE FORTHCOMING R.P.S. EXHIBITION.

THE nomination paper for Judges of the Royal Photographic Society's Exhibition, to be opened next September, has been issued. It is unfortunate that the plan of placing the paper at the back of the Society's *Journal* is still adhered to, for it thus escapes the notice of a very considerable number of members. In a measure this method of circulating an important document must be held responsible for what was nothing less than a fiasco in connexion with last year's Judges, only the exact number required being nominated by eight members so that the general body were not called upon to make a selection by vote.

There is a strong feeling in the Society that last year's apathy in regard to the election of the Judges should find no repetition next autumn. In order to prevent the possibility of its recurrence, several members have already decided to send in nomination papers bearing a list of names previously agreed upon. It is felt that, if the gentlemen whose names are given below accept nomination, and are successful on the ballot, the Exhibition will be judged by a set of men in whom the Society and exhibitors will have the greatest confidence. It may be pointed out that Mr. W. L. Wyllie is an old friend of the Society, and is highly esteemed by its members. The other eight gentlemen are, of course, members who are too well known to need particular reference beyond this: that in the Pictorial Section an assertive Salon element that has found its way there before is not now to be seen.

The suggested list for nomination is as follows:—

Pictorial Section.	Technical and Scientific Section.
Harold Baker.	Captain Abney.
Dr. P. H. Emerson.	T. Bolas.
Colonel Gale.	Chapman Jones.
J. B. B. Wellington.	
W. L. Wyllie, A.R.A.	

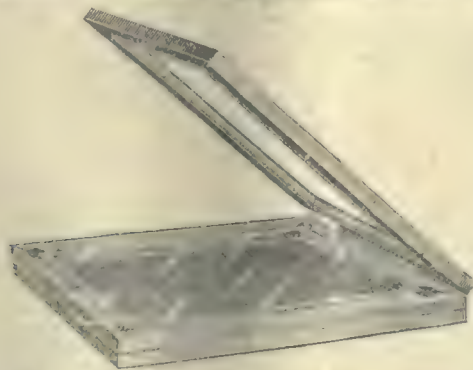
Members at a distance will be safely guided if they make the foregoing nominations. The nomination paper should be returned to the Secretary of the Society, 12, Hanover-square, by Thursday, April 20, at 12 (noon).

## Our Editorial Table.

## THE AVERY BACKING TRAY AND PAD.

G. Houghton & Sons, 89, High Holborn, W.C., and H. Lamplough, Limited, 167, Strand, W.C.

A CAPITAL device for facilitating the backing of plates has just been introduced by Mr. John H. Avery, the well-known photographer. It is in the form of a folding tray, and its advantages are thus succinctly described: A plate (no matter of what size) may be coated with the medium, without being once touched with the hands after having been placed in the tray, and, as the frame keeps the edges of the plate clean and free from backing, there is no risk of getting the backing on the hands. There is no possibility of the backing finding its way to the film side of the plate, no chance of dropping or breaking the plate, and therefore no nervousness in applying. It is also claimed to be indispensable for isochromatic plates, because it allows the plates to be backed with safety away from the light, and the plates may be left to dry in the frame, thus excluding any possibility of fogging. The manner



of its use will be understood from the instructions, which are to lift up the hinged frame, place the plate in the slot on the lower tray, let down the frame again, and, pressing the end fairly firmly with the left hand, apply the backing with the right hand in the ordinary manner. The Avery backing frame is a neat and useful piece of apparatus, which will be highly appreciated by those who desire to avoid messiness in the backing of their plates. In the matter of convenience, it will soon repay its cost.

A handy adjunct to the backing tray is the Avery backing pad, which is a washable, durable pad, made of the finest rubber sponge, and mounted on a polished wood handle. It yields a smooth, even layer all over the plate, and enables the backing to be spread thinly, thus ex-

pediting the drying process. The pad should be washed in cold water as soon as done with, and allowed to dry for future use. Frame and pad are well worth purchasing, for our use of them shows them to be exceedingly handy.

*Le Microscope et son application à la Photographie des infiniment Petits* is the title given to a practical treatise on photo-micrography by M. L. Mathet. The work is published by O. Mendel, of Rue d'Assas, Paris, and is, of course, in French. It occupies nearly 260 pages, and has many very fine collotype reproductions of photo-micrographs (not micrographs as they are termed in the book) made by the author. Although it tells us nothing new, the book is excellent and exhaustive.

*Picture-taking and Picture-making* is the title of an elegantly produced little volume which is being issued by Kodak, Limited, 43, Clerkenwell-road, E.C. In the course of about 120 pages, which are adorned by a number of excellent illustrations, the beginner is taken through the various operations of photography. A word of special acknowledgment is due to the Company for including working instructions for the platinum, carbon, bi-gum, and other processes in the volume, which others besides users of the Kodak specialities will find of real service as an introduction to the study of photography.

## CATALOGUES RECEIVED.

R. & H. Robbins, Exchange-street East, Liverpool.

MESSRS. ROBBINS' catalogue extends to about fifty pages, and contains mention of a selection of photographic apparatus and material such as amateurs are likely to require. The catalogue is well printed and got up.

Ross, Limited, 111, New Bond-street, and 31, Cocks-pur-street.

MESSRS. ROSS, LIMITED, are issuing a thirty-two page supplement to their 1899 catalogue, in which the firm's latest specialities in lenses, apparatus for optical projection, &c., are fully illustrated and described.

W. Broome, 6, Denman-road, Peckham, S.E.

MR. BROOME'S catalogue particularises various kinds of lenses (notably the casket form), cameras, shutters, &c. In favour of the quality of his lenses many testimonials are quoted.

MESSRS. R. & J. BECK, of 68, Cornhill, E.C., are issuing a neatly produced catalogue of the Frena hand camera, the uses and advantages of which popular instrument are fully described. Moreover, there are fourteen capital half-tone reproductions from Frena negatives, which show that the capabilities of the camera are of the highest. The Frena catalogue is sent free to applicants, and it should be in possession of all devotees of film photography.

## News and Notes.

PHOTOGRAPHIC CLUB.—April 19, Gloucester Cathedral. Slides by Mr. F. H. Evans.

ROYAL PHOTOGRAPHIC SOCIETY.—Photo mechanical Meeting, April 18, at 12, Hanover-square, at eight p.m. "Apparatus for Half-tone Process Work."

VISITORS and residents of Brighton will be glad to hear that a dark room, which will be available for amateurs and others, with accommodation for development of plates, films, &c., as well as changing, has been opened at the Sussex Drug Company's, Limited, well-known Central Depot, 135, Queen's-road, Brighton.

MR. J. HUBERT, F.R.P.S., the well known photographer, formerly of Mare-street, Hackney, has recently changed his address to 304, Regent-street, W. Mr. Hubert, who is the author of a book on *The Art of Retouching*, undertakes negative and positive retouching as well as portrait painting for the profession, in addition to the ordinary branches of portraiture, outdoor photography, miniature painting on ivory, and so forth. Many eminent personages have given Mr. Hubert testimonials for his work, to which we ourselves have before now favourably referred.

BEVERLEY PHOTOGRAPHIC EXHIBITION.—The following is the list of awards: Open Classes.—Landscape, Seascape, and River Scenery: 1, J. Page Cloft, Birmin'gham; 2, A. J. Jeffreys, Ohelmsford, and C. M. Wane, Edinburgh; 3, G. J. T. Walford, Peckham Rye, London. Architecture: 1, H. W. Bennett, F.R.P.S., London, W.C.; 2, withheld; 3, F. Dovaston, Oswestry. Portraiture and Figure Studies: 1, Charles Speight, Kettering; 2, John Stuart, Glasgow; 3, J. Chadlin, Taunton, Devon. Instantaneous Hand-camera Work: 1, W. Fisher Ward, Bawtry; 2, J. Kearney, jun., Liverpool; 3, W. E. Inston, Liverpool. Enlargements: 1, F. Woollons, Hull; 2, A. G. Peck, Hull; 3, C. M. Wane, Edinburgh. Lantern Slides: 1, A. E. Smith, Kingston-on-Thames; 2, J. Kearney, jun., Liverpool; 3, W. E. Cowan, Newcastle. Painting, Sketching, &c.: 1, W. R. Duffill, Beverley; 2, Miss Bainton, Beverley; 3, T. H. Flather, Scarborough. Members' Classes.—Landscape, Architecture, &c.: 1, Thomas Tanfield, Beverley; 2, Rev. W. E. Wigfall. Portraiture and Figure Studies: 1, T. B. Barton, Beverley; 2, J. C. Cook, Beverley; 3, Thos. Tanfield, Beverley. Excursion Work: 1, T. Tanfield, Beverley; 2, withheld; 3, G. Dawson, Beverley. Enlargements: 1, Rev. W. E. Wigfall, Beverley; 2, withheld; 3, T. Tanfield, Beverley. Lantern Slides: 1, withheld; 2, Rev. W. E. Wigfall; 3, T. Tanfield.



**A NEW GUN CAMERA.**—A new gun camera, probably the finest ever built, is being constructed in Chicago by William Gaertner for the Smithsonian Institution at Washington. The specifications required that the instrument should be capable of making a successful exposure in one six-hundredth of a second. It is hoped that this speed will be increased, so that a good negative may be obtained by an exposure of only a thousandth of a second. The principal purpose for which this camera was designed is to serve the photographing of aerodromes, with which Professor S. P. Langley, Secretary of the Smithsonian Institution, is conducting elaborate scientific experiments in an attempt at the solution of the problem of aerial flight. The instrument is provided with a delicate measuring apparatus, by which the precise angle at which the camera is tilted at the moment of exposure is known to the operator, and is also photographed on the plate. This device will enable scientists to determine, under given conditions, the exact location and elevation of the object photographed.—*Scientific American*.

**NOVELTIES FOR THE PARIS EXPOSITION.**—If the Management of the Paris Exposition fulfils its promise, no small number of technical marvels will be revealed to the public in 1900. First of all there will be Czapanik's much-heralded telestroscope, an instrument which, by the aid of selenium, is said to have solved the problem of electrical vision. The telestroscope will, however, find a rival in the telautograph, invented by Anton Pollak, a Hungarian engineer. The telautograph, it is claimed, provides a means of receiving messages sent from one station to another in exactly the same form in which they were transmitted. The idea in itself is old, but the inventor is said to have devised an apparatus which is entirely different from its predecessors. Pollak claims to have solved the problem by using selenium, a metal which is unique in possessing the property of conducting electricity with a resistance which varies with the intensity of the light that falls upon it. The varying illumination is produced by treating the written telegram in a peculiar manner, and the variations in resistance effected by the selenium are communicated to a conductor to produce an increase and decrease in the intensity of the current passing therethrough. According to Uhlard's *Wochenschrift*, the Vereinigte Elektrizitäts-Aktiengesellschaft, of Budapest, has applied to the Management of the Exposition for space in which to exhibit the apparatus. An imperfect model is said to be in tolerably successful operation, and to be able to transmit in one hour 144 telegrams, each four inches by two inches, upon which space any number of words or characters can be inscribed.

**RE THOMAS YORK MORTER**, photographer and photographic dealer, carrying on business as "T. & E. Morter," at 8, Queen-street, Colchester.—The public examination of the above-named debtor took place at the Colchester Bankruptcy Court on April 7, before the Registrar (Mr. Henry Goody). The statement of affairs filed by the debtor disclosed gross liabilities amounting to 427*l.* 4*s.* 2*d.*, of which 351*l.* 15*s.* 6*d.* was expected to rank for dividend, 342*l.* 15*s.* 6*d.* of the latter sum being due to sixty-three unsecured creditors. The assets were estimated at 131*l.* 18*s.* 7*d.*, leaving a deficiency of 337*l.* 16*s.* 11*d.* The unsecured creditors included Groom, Daniel, & Co., 30*l.* 18*s.* 9*d.*; D. W. Green, Colchester, 25*l.* 17*s.* 9*d.*; G. Houghton & Son, 18*l.* 7*s.* 5*d.*; Photographic Supply Company, 16*l.* 7*s.* 6*d.*; O. Sichel & Co., 79*l.* 19*s.* 9*d.*; and F. M. Wallis, Halstead, 24*l.* 4*s.* The Official Receiver's observations were to the effect that the debtor was for some time manager of a boot manufacturer in Colchester, but that in 1894, having a free capital of about 40*l.* in money, together with some furniture, he started business as a photographer, but traded under the style of "T. & E. Morter," those being the initials of two of his sons, to whom in time he hoped to transfer the business, but neither of them ever were partners in the concern, and neither of the two are yet of age. He states there is great competition in the photographic business, and that he has been obliged to do what work he has done at prices that were not remunerative. Practically the whole of the assets are said to be covered by a bill of sale, and a sum of 7*l.* 10*s.* accrued due of March 25 for rent. The trustee in bankruptcy will probably have a better title than the bill-of-sale holder to the more valuable part of the goods on the premises. The creditors fully secured hold a life policy for 50*l.*, which has been in force about seven years, and on which 10*l.* has been paid. The creditors returned as partly secured are the Bedfordshire Loan Company, 68*l.* 10*s.*, and the landlord for 7*l.* 10*s.*, and the security held is a bill of sale on photographic apparatus, studio, and furniture, which the debtor estimates to be worth 57*l.* With regard to the bill-of-sale holders, the debtor states he has received from them in all 67*l.* in two separate amounts, and that he has repaid 59*l.* on account of it, and now owes about 70*l.* The only book of accounts kept by the bankrupt is one which is a record of goods sold on credit, consequently the books do not show when the debtor first became aware of his insolvency, but he admits he has known it for several years, during which time he has contracted some small debts. The debtor attributed his deficiency to bad trade, heavy interest on borrowed money, legal expenses, and bad debts, but at present he has furnished no details. Mr. Ashor Prior appeared for the debtor. In reply to the Official Receiver, the bankrupt stated that his household furniture and photographic apparatus was entirely covered by a bill of sale held by the Bedfordshire Loan Company, being, in addition, subject to a distress for rent by the landlord, who had that morning put the billiffs in possession. Asked as to the circumstances under which he gave the bill of sale to the Bedfordshire Loan Company, the debtor said that at the outset he borrowed 33*l.* or 34*l.* from the Company on a note of hand, and signed for 50*l.* This transaction took place in 1896. In connexion with the note of hand, he repaid 15*l.*, and, as he was unable to meet the next instalment, the Company issued a writ, and the only course open to him was to give a bill of sale on his furniture and effects. The Official Receiver: Did you receive any further money then? Debtor: I received 33*l.*, I believe. There was 75*l.* handed to me in cheques, but I had to return all but 33*l.* The Registrar: This is the form, I suppose. Yes, it goes in one hand and out of the other. The Official Receiver: That was a bogus transaction, then, with the exception of the 33*l.* you received. Debtor replied in the affirmative, and, continuing, said he had had from the Bedford Loan Company about 67*l.* in all, and of that sum he had repaid 59*l.* Some time ago Mr. Isaacs, the manager of the Loan Company, had complained to him in reference to his irregular payments, and informed him that debtor then stood

in the same position as before, and still owed 75*l.* When employed by Mr. John Kavanagh as manager of the boot manufactory, he was in receipt of a salary of 3*l.* per week, and relinquished the position on account of the fact that he was uncertain as to when his appointment might terminate. He attributed his present position to bad trade, the heavy interest he had paid on the loan, and the fact that he had lost three months' trade in removing from one shop to another. Replying to Mr. H. W. Jones, a creditor, the debtor admitted that he had kept no account books or any statement of receipts and expenditure. Mr. Jones observed that debtor was entitled to sympathy, but, at the same time, was very much to be condemned for going to such people as these money-lenders. The bankrupt said he had repaid 59*l.*, and still owed 75*l.* Mr. Jones (with emphasis): "Sharks!" The examination was adjourned until May 16.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
15.....	Borough Polytechnic.....	Excursion: Loughton and High Beech. Leader, E. G. Hawgood.
17.....	Bradford Photo. Society.....	From <i>Canterbury</i> to <i>Canterbury</i> . Dr. Llewellyn Morgan
17.....	Camera Club.....	Demonstration Evening: Photographic and Mechanical.
17.....	Richmond.....	Print Competition.
18.....	Birmingham Photo. Society ..	Exhibition of Mezzotint Engravings produced from 1760 to 1800, by eminent Engravers, from works by leading Artists of the Period. Kindy lent by E. Haines, M.A.
18.....	Hackney.....	<i>Our Swiss Trip</i> . L. S. Wilks, F. E. Roope, J. J. Westcott, and W. Fenton-Jones.
18.....	Iale of Thanet.....	Lecture: <i>Practical Points in Exposure, Development, and Printing</i> .
18.....	Lewisham.....	Lenses. M. Stodart.
18.....	Royal Photographic Society ..	Photo-mechanical Meeting: Apparatus for Half tone Process Work.
19.....	Borough Polytechnic.....	Flower Photography. H. T. Malby, F.R.P.S.
19.....	Leeds Camera Club.....	Demonstration: Stereoscopic Transparencies. C. Grayson.
19.....	Photographic Club.....	Slides: Gloucester Cathedral. F. H. Evans.
19.....	Southsea.....	Faults and Blemishes and their Causes. Development. Mr. Fmiler.
19.....	Woodford.....	<i>The Colony of Lagos</i> . Hon. Thomas E. Rayner, Chief Justice.
20.....	Camera Club.....	Enlarging Evening.
20.....	Darwen.....	Lantern Night: <i>Stockholm, &amp;c.</i> L. Medland.— <i>South Africa</i> . Mr. Pritchard.
20.....	London and Provincial.....	<i>A Holiday in Venice</i> . E. D. Purcell.
20.....	Putney.....	<i>The Record Survey of England</i> . Mr. Scamell.
21.....	Oroydon Microscopical.....	

### ROYAL PHOTOGRAPHIC SOCIETY.

APRIL 11.—Ordinary Meeting.—The Right Hon. the Earl of Crawford, K.T. (President), in the chair.

#### NEW MEMBERS.

Six new members were elected, and two candidates for membership were nominated.

#### THE EXHIBITION.

The PRESIDENT announced that the Council had appointed the Selecting and Hanging Committee for the forthcoming Exhibition as follows:—Pictorial: Messrs. Vivian Hyde, J. A. Hodges, J. B. B. Wellington, R. Child Bayley, A. Mackie, and J. C. S. Mummery. Technical and Scientific: Messrs. Chapman Jones, F. A. Bridge, E. J. Wall, J. J. Vezey, T. Bolas, and Captain W. de W. Abney.

#### EXPOSURES IN CORONA PHOTOGRAPHY.

Mr. E. WALTER MAUNDER, F.R.A.S., read a paper on "The Correct Exposures to be given to Photographs of the Corona," in which he discussed the question—Given a total eclipse of the sun, the sky clear, the sun high, what exposure or exposures should be given in order to secure a complete record of the different details of the corona? The solar prominences and chromosphere, the inner and outer corona, and the coronal rays, differ so enormously in brightness, that the problem at first sight appeared impossible of solution, except by the method of giving a great variety of exposures to different plates, with the certainty that no one plate would satisfactorily show more than one or two of these regions. At the last eclipse the only observer who did not proceed on this principle was Professor Burchhalter, who devised an ingenious plate-holder which gave an exposure to the outer coronal regions fifty times greater than that which the inner received, and the degree of success which he attained rendered it more imperative than ever that the best exposure for each different region should, if possible, be ascertained. The exposures employed during the late total solar eclipse varied in equivalent duration from 1 to 7200, and three series of photographs placed at Mr. Maunder's disposal—slides from which were shown—gave together a range of equivalent durations from 1 to 1800, and were all taken with very small apparatus, the apertures varying from  $\frac{1}{16}$  inches to  $\frac{1}{4}$  inches, and the *f*-a being respectively 57, 143, and 6. A comparison of these photographs appeared to show that, with *f*-15 and an extra-rapid plate,  $\frac{1}{16}$  of a second to  $\frac{1}{4}$  of a second was ample for the prominences; while for the inner corona  $\frac{1}{16}$  to  $\frac{1}{4}$  was sufficient, the amount of the corona photographed increasing rapidly until the exposure reached about half a second. Beyond this point the prolongation of the expo-



sure was of little advantage; and in a clear sky, with a high sun, one second might be taken as practically the limit of a serviceable exposure with  $f$ -15 and the most rapid plates. The extensions or streamers, however, were much fainter than the corona proper, and a considerably longer exposure was necessary to secure them, as long as 100 seconds or more being required, intermediate exposures tending only to spoil the photographs of the corona proper without securing any extension worthy the name. These prolonged exposures raised special difficulties, owing to the proximity of the long, faint streamers to the overpowering brilliancy of the corona itself, and the author attributed the success which Mr. Maunders achieved in this direction to the employment of triply coated plates. He thought the superior limit of exposure for the streamers had not yet been reached, his opinion being based on the fact that nearly two minutes after totality a plate was exposed for one and a half seconds (equivalent to about nine seconds with  $f$ -15), which showed the inner corona entirely round the dark disc of the moon, close to the reversed and solarised image of the emerging sun, the first time that the corona had been unmistakably photographed in so much sunlight. He thought that, except for particular purposes, the corona could be perfectly well photographed with most cameras by a snap-shot; and the camera should be pointed directly to the eclipse, and be firmly fixed, and if the aperture did not exceed  $f$ -15 or  $f$ -20, and the image of the sun did not exceed an inch in diameter, an equatorial stand or a driving clock was not necessary.

Captain HILLS, R.E., congratulated Mrs. Maunders upon her "record" photograph, showing streamers extending five and a half times the sun's diameter, and alluded to the importance of considering the weather conditions at the moment of totality, and of keeping one's head so as to properly adjust the exposures in accordance with those conditions. He showed some prints from Kodak negatives (of course, very small) in which the corona was clearly depicted.

The Rev. F. C. LAMBERT asked whether the speeds of the different plates used had been taken into consideration in tabulating the exposures and the results, and he suggested the possibility of making composite prints from a series of negatives showing various phases of an eclipse.

Mr. SEBASTIAN DAVIS referred to the question of the influence of the developer upon the result, some developers giving brilliancy, while others gave detail, and also to the importance, in such delicate work, of testing the plates by immersing an unexposed plate in the developer, and noting whether any effect was produced solely by the action of the developer, and without the access of light.

Dr. LINDSAY JOHNSON suggested that the use of suitable colour screens might tend to render detail which could not otherwise be secured.

The PRESIDENT mentioned some of his own experiences when photographing the eclipse of 1870 at Cadiz, when he used a reflecting telescope of 12 $\frac{1}{2}$  inches aperture and about 7 feet focus, the exposure with wet plates being, of course, very much longer than was now necessary. The great difficulty arose from the light in the sky, which was so considerable that he had never been able to believe the time-honoured story that chickens went to roost during an eclipse, under the mistaken impression that bedtime had arrived.

Mr. MAUNDERS, in acknowledging the hearty thanks of the Society, said the speeds of the plates had been taken into consideration in reducing the exposures to a common factor, as also had the developers, and plates had been tested before developing the negatives, as suggested by Mr. Davis.

#### SHUTTER SPEEDS.

Dr. LINDSAY JOHNSON described an instrument, which he presented to the Society, for testing the speed of shutters without taking a photograph. It appeared to consist of a clockwork arrangement, by means of which a diaphragm, pierced with a number of equidistant apertures, was rotated, and the speed of a shutter was ascertained by counting the apertures visible between its opening and closing.

#### COMING EVENTS.

April 18, Photo-mechanical Meeting. Exhibition of Apparatus for Half tone Process Work. April 25, Technical Meeting. A demonstration of the making of glass diaphragms, from "thin" to Newton's "very black" stage, by Mr. Thomas Bolas, F.I.C., F.C.S.

#### PHOTOGRAPHIC CLUB.

APRIL 5.—Mr. A. Mackie in the chair.

Mr. E. W. Foxlee handed round some stereoscopic glass positives, made about forty years ago, and condemned at the time as not of saleable quality. It was interesting to have an authentic case like this, where one could see what sort of standard photographers set themselves, the examples shown being of such a quality which would probably not, in these days, preclude their ready sale.

There was some discussion regarding the ozotype process of Mr. T. Manly for carbon printing. In this process, it will be remembered, the image is printed upon what is practically the transfer paper, and this fact led to the recall of the details of a method described by M. Marion, in 1873, before the Photographic Society of London. "Mariotype by contact," as it was called, was akin to Mr. Manly's process, although not so much as to be confused or regarded as one. M. Marion printed his negative upon a piece of sensitised transfer paper instead of upon the sensitised pigmented tissue, thus allowing printing to be observed as in silver and other processes. The image is of a pale brown tint, without vigour. The print is then immersed with carbon tissue of the desired tint in a bath of bichromate of two per cent. strength, the two are brought into contact, and squeezed. The similarity in result, if not in action, between Mr. Manly's and M. Marion's process is here apparent. The printed image on the transfer paper in both cases effects a change upon the pigmented gelatine tissue such as light would have exerted in the usual way. Marion's process required that the squeezed print and tissue should remain some ten hours between blotting-paper under a weight, after which development is effected in warm water.

**Borough Polytechnic Photographic Society.**—This Society opened their outdoor season on Easter Monday with a successful trip to Ely Cathedral, under the leadership of Mr. H. S. Kemble. A goodly number of members turned out, and, through the courtesy of the Cathedral authorities, very little difficulty was experienced with holiday visitors. Ideal weather prevailed, and altogether a most profitable day's work was accomplished. A substantial tea was afterwards served in good style at the City Temperance Hotel, the well-known rendezvous of all photographic visitors to the Cathedral. The privilege granted by the Great Eastern Railway for the party to travel in reserved compartments on excursion trains was greatly appreciated, particularly on the return journey. The Borough Polytechnic Photographic Society are moving strong in the matter of outings this season, and some good and useful trips are promised. A detailed programme can be obtained of the Excursion Secretary, Mr. P. C. Cornford, at 105, Borough-road, S.E.

#### Redhill and District Camera Club.—

#### DRY-PLATE PROCESSES AND MODERN DEVELOPERS

was the title of a most interesting lecture given by Mr. WILLIAM BROOKS at the fortnightly meeting of this Club on Tuesday, April 4. Mr. Brooks began his lecture with a brief reference to the first attempts at dry-plate processes carried out during the early part of the present century. The albumen and morphia processes were then described, and negatives on plates coated with these emulsions were shown. The gum-gallic process was next referred to, and a negative taken in 1869 shown. Mr. Brooks then gave a practical demonstration in the preparation of collodion dry plates, showing how the emulsion was prepared and the plate sensitised. Drawing attention to the importance of only using the finest and best cotton in preparing collodion emulsion, Mr. Brooks said that an ideal cotton was very difficult to obtain, as that sold by the chemists was practically useless. Several fine collodion negatives were then handed round, the clearness and depth of the shadows to be obtained by this process being pointed to. After some remarks on the gelatine dry plate, Mr. Brooks gave a *résumé* of the principal modern developers, amidol and glycin ranking first in his opinion. He had also a word of warning to say about the use of metol, asserting that its use was attended not only with considerable risk of prolonged injury to the skin of the hands, but even to life.

#### FORTHCOMING EXHIBITION.

1899.

April 14–May 13..... National Trades and Industrial Exhibition, Bingley Hall, Birmingham. Manager, Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.

## Patent News.

THE following applications for Patents were made between March 20 and April 1, 1899:—

BACKING DEVICE.—No. 5970. "An Improved Device for the Application of a Paste Backing or suchlike Composition to Photographic Plates." J. H. AVERY and C. VARNAM.

FABRIC PRINTING.—No. 6010. "Improvements in Photographic Print Fabrics." Complete specification. J. A. HARVEY.

PLATE-HOLDERS.—No. 6076. "Improvement in Plate-holders and Means of Attaching same to Camera." F. SHEW.

IMITATION PHOTOGRAPHY.—No. 6122. "A Method of producing Photographs in Imitation of Wax Seals and the like." C. S. JONES.

CINEMATOGRAPHY.—No. 6202. "Means for Taking and Exhibiting Cinematographic Pictures." F. M. LEE and E. R. TURNER.

CINEMATOGRAPHY.—No. 6327. "Improved Means and Apparatus for Exposing Photographic and like Views Cinematographically." L. E. GRANICH-STADTEN.

CINEMATOGRAPHY.—No. 6350. "An Improvement in Apparatus for Taking, Printing, and Exhibiting Photographs." A. WATKINS.

CAMERAS.—No. 6462. "Improvements connected with Photographic Cameras." F. W. SAXBY.

FOCUSSES.—No. 6560. "Connecting the Focussing Gear of a Process Camera with the Screen Gear thereof." O. LINLEY and T. W. LASCELLES.

ENLARGING CAMERAS.—No. 6588. "Improvements in or connected with Photograph Enlarging Cameras." A. STALINSKI.

SHUTTERS.—No. 6628. "Improvements in Photographic Shutters." J. E. THORNTON.

STORING PLATES AND FILMS.—No. 6629. "Improvements in the Mounting, Storing, and Manipulation of Sensitised Plates and Films." J. E. THORNTON.

CAMERAS.—No. 6639. "Improvements in or connected with Photographic Cameras, part of which Improvements are also applicable to Opera Glasses and the like." W. H. McCANDLISH.

LENS MOUNTS.—No. 6708. "Improvements in Mounts of Photographic Lenses." RATHENOWER, OPTISCHE INDUSTRIE-ANSTALT.

MAGAZINES.—No. 6705. "Improvements in Magazines for Photographic Plates." J. F. G. DE GEORFOY.

APPARATUS.—No. 6708. "Improvements in Photographic Apparatus." Complete specification. O. D. BINGER.

CHANGING BOX.—No. 6734. "Improvement in Photographic Camera and Changing Box for use with Sensitive Plates and Films, and Means of Protecting same when Exposed." W. C. WHITE.



**CAMERA FITTINGS.**—No. 6775. "Improvements in Fittings for Cameras." J. A. WILBY and W. L. TATTERSALL.

**STEREOSCOPIC PHOTOGRAPHS.**—No. 6794. "Improvements in Apparatus for taking Stereoscopic Photographs and for Exhibiting the same." Complete specification. W. K. L. DICKSON.

**INTENSIFYING PRINTS.**—No. 7021. "Improved Process for Intensifying Photographic Silver Prints." Communicated by Actiengesellschaft für Anilin Fabrikation, Germany. C. D. ABEL.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### THE GLOUCESTER CONVENTION.

To the Editors.

GENTLEMEN,—On Wednesday next, the 19th inst., a lecture will be delivered by Mr. F. H. Evans at the Photographic Club (Anderston's Hotel, Fleet-street, E.C.) which should be specially interesting to intending Conventioners.

The subject is "Gloucester Cathedral," and those who may have had the pleasure of hearing Mr. Evans and seeing his slides of similar subjects will not need to be assured of an enjoyable evening.

Mr. W. B. Stretton (4, Queen street-place, London, E.C.), the Hon. Secretary of the Club, will be pleased to send tickets to any who may apply for them, and visitors will be heartily welcomed by the members. —I am, yours, &c.,

F. A. BRIDGE, Hon. Secretary and Treasurer, P.C.U.K.  
East Lodge, Dulston-lane, London, N.E., April 8, 1899.

### ROLLABLE FILMS.

To the Editors.

GENTLEMEN,—The letters in your Correspondence columns re cheap rollable films recall a question which has interested me, and to which some readers of THE BRITISH JOURNAL OF PHOTOGRAPHY may have something to say. It is this: Why are there so many varieties of plates manufactured and practically only one rollable film? Is it because there is no demand for the article in question? Consider its advantages: (a) daylight changing, (b) any quantity can be carried without increasing the thickness of a folding camera, e.g., folding pocket Kodak, (c) without increasing the smallest possible rectangular dimensions of a box camera (e.g., bull's-eye Kodak), (d) the only detachable magazine (except the heavy and costly changing box), (e) it has rendered possible the cinematograph, (f) owing to the simplicity of the necessary apparatus, cameras are perfectly efficient and self-contained.\*

It is not too much to expect that long bands of rollable material must ultimately take the place of separate sheets in the manipulations of photography, just as has been the case in other branches of manufacture, e.g., paper-making and printing. The advantages are too obvious. The greatest objection that can be urged against rollable film is that it is not substantial enough, as Captain Abney puts it, it does not possess the ideal flatness of surface that the new lenses require for the best results. Much of this may be got rid of by careful construction of the holder. Our premier form of high-class hand-camera makers have adopted the roll-holder, so difficulties in that direction may be discounted. Then there is the objection that one cannot conveniently develop single pictures, which is certainly considerable, though not so great since the short spools for twelve exposures have become common. The difficulties of development are to be got over only by practice, just as any other difficulty in photography.

Your correspondents suggest the reintroduction of a stripping film. Such an article is very desirable, and, with the celluloid film at its present high price, should be commercially successful if supplied at a reasonable cost—not more than 9d. for the quarter-plate spool of twelve exposures. But, of course, what is really wanted is a cheap non-stripping film at a price not considerably above that of plates. Considering the much greater reduction that has taken place in their prices, this does not seem too much to hope for.

Moreover, why is it that we never hear of any alternative to celluloid, a basis about which so many complaints are made? Is it possible that the resources of the manufacturer can discover nothing else in this go-ahead age, or is it probable that, if photographers still made the most of their own material, as used to be the case, we would long be without a single rival to celluloid (excepting setcoid)? It is here that one deplores the lack of interest which amateurs and professionals alike take in all that concerns the fermentation of the sensitive films they use. To an extent unknown in any other branch of science, the knowledge of the many has become the knowledge of the few. How many, for instance,

\* May be made at a smaller cost than those to carry plates or cut films.

have any accurate idea of the means by which such an enormous increase in speed of sensitive emulsion has been obtained within the past few years, or can you get a text-book which even hints at the matter? Details of processes which used to be knowledge easily attainable to all are now guarded jealously by manufacturers as secrets it would be ruinous to divulge. The amateur experimenter, who used to be a power in the land, is now almost extinct, and the manufacturer can only experiment along lines which are likely to yield profitable results, leaving questions of merely scientific interest severely alone, a policy which, though necessary, is, on the face of it, opposed to the interests of all true progress.—I am, yours, &c., H. M.

### THE COLOUR OF RESIDUE INDICATING THE TEMPERATURE AT WHICH ACETYLENE IS GIVEN OFF.

To the Editors.

GENTLEMEN,—Your contributor, Mr. G. R. Baker, has noted and replied to my statement "that the black colour is not to be relied on as an indication of temperature, but rather as an indication of bad carbide," and has pointed out that it is Professor Vivian Lewes who is responsible for the statement I took exception to. Further, Mr. Baker has ventured an explanation as to why my black residues are not due to faulty carbide—is that the carbide has become coated with a tarry residue which protects it from the action of water. I reply, This is not the solution. I venture to still adhere to the opinion—in fact, more strongly express it—that the black colour is more often due to bad carbide than to overheating. This statement of Professor Vivian Lewes, if allowed to go unquestioned, might be used to cover up inferior carbide; and the admission of the truth of my statement is of importance to users of acetylene. That you, Mr. Editor, may form some opinion of the "tarry deposit" on my black residues, by same post I send you a sample of the black residues, which I hold indicates that bad carbide has been used.

Many statements have, of late, been current re acetylene—emanating mainly from those commercially interested in carbide or apparatus for, and such as must be estimated as "professionally fee-paid opinions," which, if not actual mis-statements, are pronouncedly misleading. One of these statements, freely circulated and often quoted, is that one cubic foot of acetylene is equal in value for lighting to sixteen cubic feet of ordinary town gas. I hold such a statement is barely true under the worst conditions of town gas and the best of acetylene; and that, if the ratio value were taken under average conditions, and with the present incandescent gas system, the truth would stand, one cubic foot acetylene equals two of town gas. A correspondent in the *English Mechanic* says that the cost of lighting by the two systems is "that acetylene costs twelve times that of town gas."

Acetylene is in many points a most desirable light, and much of its future is in the hands of the present makers of carbide of calcium; it is for the users to remove any misleading statements which might gain force if left unchallenged.—I am, yours, &c., VEDA.

### THE NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.

To the Editors.

GENTLEMEN,—In answer to Mr. Rees' article in your JOURNAL of April 7, will you allow me to again state that such an Association as he sketches does already exist in the National Photographic Record Association, the object of which is to organize photographic survey work throughout the British Islands, and also to collect photographs of objects of interest—scenery, life customs, &c.—as may be of use to posterity as a record of our times, and to mount and deposit such prints in the British Museum for public reference. Up to date they have received some 600 prints including such subjects as suggested in Mr. Rees' letter.

The Council look for generous support from photographic and camera clubs throughout the country as well as from individual amateur photographers, many of whom must possess rich stores of old and neglected negatives taken in past years of buildings, &c., since destroyed and of which there is a possibility of all records being lost.

I shall be happy to forward particulars as to membership, class of photographs desired, &c., on application.—I am, yours, &c.,

21 Avenue-road, Highgate, London, N. GEORGE SCAMMELL, Hon. Sec.

### THE COOKE LENS AND THE T. T. & H. ADVERTISEMENTS.

To the Editors.

GENTLEMEN,—Your last issue but one contains a very interesting patent specification, wherein Mr. H. Dennis Taylor gives a description of certain improvements in the Cooke lens. After referring to the means by which certain lenses may be used at will for different focal lengths, Mr. Dennis Taylor proceeds with the statement that the Cooke lens cannot be used in such a manner, and that his present invention is "for the purpose of supplementing this deficiency in a sufficiently simple and effective manner."

I have watched with sardonic interest Messrs. Taylor, Taylor, & Hobson's altruism, as shown in their advertisements, and the following



specimen, published in a contemporary on May 13 last, acquires additional interest at the present moment:—

"There is a sort of knife, prized by schoolboys, which contains a saw, a toothpick, and a hammer. Older people know that, if they want a good knife and a good saw, they must buy them separately. It is the same with photographic lenses. There are some lenses which can be used in bits to form other makeshift lenses. Cooke lenses are not of this sort. Their glasses cannot be used separately. They are made for fine work, and are very accurately adjusted, and no lens which is frequently separated and rearranged can retain the requisite precision of adjustment which Cooke lenses always possess."

This advertisement was an attack on certain lenses, the components of which could be used separately or paired up with other lenses to form other combinations of different focal length. Yet within twelve months we find the Cooke lens is to be improved in a similar manner.

Will Messrs. Taylor, Taylor, & Hobson amend their advertisement, and proclaim, "There is a lens, prized by schoolboys, which contains," &c. &c.—I am, yours, &c.  
PHOTOGRAPHER.

### CINEMATOGRAPHING A MURDER.

To the Editors.

GENTLEMEN,—I notice in your issue of the 3rd ult. an article stating that cinematograph pictures were offered in evidence in the trial of a recent murder case in our Criminal Court.

The whole statement is in error. The murder of the late Mr. Baker took place in the street, not in a room, as stated. No cinematograph pictures were made or used. The only photographs were some taken by a local photographer, long after the murder, and intended to show to the jury, had they been admitted as evidence, some of the conditions under which the murder occurred.—I am, yours, &c.,  
2636, Osage-street, St. Louis, March 27, 1899. WILLIAM M. BUTLER.

### PHOTOGRAPHIC SOCIETIES THEN AND NOW.

To the Editors.

GENTLEMEN,—A very interesting and unique letter has been discovered by the President of the Leeds Photographic Society as to the procedure of the club in regard to obtaining the interest of its members in the very early stages of its career in the year 1853. As I thought you would perhaps like to print such a letter, I have taken the liberty of enclosing you same.

In view of the very lackadaisical way in which some societies go about their work, the letter is doubly interesting.—I am, yours, &c.,  
WALTER L. FIELDHOUSE.

40, Tempest-road, Beeston-hill, Leeds, April 7, 1899.

[COPY CIRCULAR.]

"The next meeting of the Leeds Photographic Society will be held on Thursday evening, September 8, at No. 4, Park-row, to commence at eight p.m., when a discussion will be opened by J. W. Ramsden on the action of bromine and the bromides."  
"Leeds, 8 month, 1853."

[COPY LETTER.]

"At the meeting held August 23, a by-law was passed to the effect that 'The business of the meeting be commenced punctually at a quarter past eight, that five shall form a quorum, and that, if at the time specified there be not five members present, there shall on no account be a meeting that evening.'

"It was further requested that the Secretary should impress upon the members the duty of regularly and punctually attending the meetings, through the neglect of which the Society was not doing the amount of good it ought to do.

"It was resolved that at our next meeting (September 8) each member be expected to bring up the title of a paper, and which he will volunteer to read at some meeting of the Society within six months. Any member prevented from attending is requested to send to the Secretary the title without fail before the day of the meeting. This arrangement would, it was thought, put the proceedings of the Society in a more regular train.

"Members are requested to come prepared to enter into the discussion on bromide, as the opening by J. W. Ramsden will be merely a formal one.

"H. B. BRADY, Hon. Secretary."

### THE TANQUERAY FREE PORTRAITS.

To the Editors.

GENTLEMEN,—A gentleman brought me a Tanqueray enlargement to frame for him; he received the circular (which by the way I have, and am likely to keep it), which promises to send an enlargement free of charge. I asked what it cost him, he told me they notified the picture was ready and recommended a frame which was an enormous price; he wrote them and said he was too poor to have such a frame, and after writing three or four times he got it eventually after being bound to send eight francs (6s. 8d.) to pay carriage, so it cost him 6s. 8d. without the letters he sent; asked what I thought of it, I told him it was just about worth what it had cost him and I added I would make him one equal to that for 10s. 6d. I fail to see where the four guineas' worth is.

I thought perhaps you would not mind me sending this note, as you were writing about it some little time ago.—I am, yours, &c.,  
North-street, Garshilton.  
F. HOLLOWAY.

[We are pleased at having the opportunity of publishing our correspondent's letter. The more light that is thrown on the business methods of Tanqueray the quicker will the time come when he and his congeners will find their occupation gone.—Eds.]

### THE FUTURE OF PHOTOGRAPHIC ASSISTANTS.

To the Editors.

GENTLEMEN,—Your leaderette in the JOURNAL *re* above question ought to do good both to master and workman. I am sure a better feeling ought to be shown between both than is done in a great many cases at the present time; but operators and retouchers bring a lot of it on their own shoulders, and, when you consider a lot of situations are got by fraud and false pretences, you cannot be surprised at the bad feeling that exists in the master's breast.

For example, four years ago I had occasion to engage an operator and retoucher (assistant). I wrote to one advertising in this JOURNAL, and asked him to send me specimens of his work. To my astonishment, three out of four were taken by us in our studio here. I wrote him and told him unless he could give me particulars how he got the specimens I would expose him in the JOURNAL. He explained how, and I found they were printed and sent out by one of our assistants. However, I engaged the man, and have had no room to regret it. About twelve months since, I was short of another hand, and advertised in our local papers, had an applicant, asked for specimens, and this time had six sent, but three were the same as our operator was engaged on. I asked him (the operator) if he could explain how this man could get hold of the same specimens, and he said no doubt some of the assistants had printed and sold them, as is frequently done. I went to Leeds to see the applicant, and found out that he was only an amateur.

I don't like this sending specimens, and if photographers would drop their jealousies, and when we had an applicant for a situation, could ask such a one to call at so-and-so studio and retouch a negative and do a couple of prints, we should know who we were engaging, and worthy men would get good situations. But, until something is done, masters and workmen suffer, and masters often are paying a good salary for an operator or retoucher to learn their business.

I am sure both men and masters will be thankful to you for ventilating a question that has given a lot of trouble to all concerned. Thanking you in anticipation,—I am, yours, &c.,  
HENSTEPS.

To the Editors.

GENTLEMEN,—I have read with interest the many letters appearing in THE BRITISH JOURNAL OF PHOTOGRAPHY setting forth the troubles of photographic assistants.

He will be a clever man indeed that successfully launches a "Photo Assistants' Union."

How many have availed themselves of the Shop Assistants' Union? Where is the Benevolent Society?

The average photo assistant's idea of providing for a rainy day is well known to those who work amongst them.

How many assistants buy the ALMANAC or the JOURNAL when they are in employment? Not one in ten, consequently they are all behind in anything new that comes to light.

Now, Mr. Editor, there is a chance to remedy one evil.

Why should not a fixed quarterly subscription, entitle a subscriber to receive by post THE BRITISH JOURNAL every week, the ALMANAC, and to advertise free in the "Situations Wanted" when he is out of employment.

A stern rule that subscribers only shall have the privilege of advertising for a situation in your paper would force enlightenment in the way of many, and would, I think, be the first step to better times.—I am, yours, &c.,  
ASSISTANT.

[Many other letters to the same purport as the foregoing have also reached us, but, as their contents are mainly repetitions of what has already been said on the subject, it is not necessary to publish them. The correspondence has revealed a state of things in the photographic labour market for which it is difficult, if not impossible, to suggest a remedy. If aggrieved assistants will not combine for the purposes of self-help and mutual protection, it is hopeless to expect that any material improvement in their general condition will take place; and, even were such a combination formed, it is very doubtful, in the peculiar circumstances of the case, whether a satisfactory solution of the problem would be reached. The simplicity of modern photography is responsible for flooding the photographic labour market with an overwhelming amount of mediocre ability which we fear is usually remunerated in the exact ratio of its value. On the other hand, we are convinced that in photography, as in every other pursuit, the law holds good that talent is bound to assert itself in the long run.—Eds.]



## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

H. C. Mosser, 29, Castle-street, Salisbury.—Cabinet photograph of L. E. Pyke, Esq., Q.C.

A. Glass, 79, St. Leonard's-road, Windsor.—Photograph of 2nd Life Guards returning from church, Easter, 1899.

F. Coghlan, 31, Carlisle-road, Londonderry.—Photograph of the Very Rev. Charles McPaul, P.P., Londonderry.

A. McHarris, County Studio, Stranraer.—Photograph of casket given to the Right Hon. John Hamilton Dalrymple.

The Globe Photographic Company, 29, High-street, Southampton.—Two photographs of Captain Reeks: 1. standing position; 2. sitting position.

IN OUR NEXT.—A. G. FIELD, &c.

VICTOR SELB (Anvers).—Imperial Mills, Hereford, is the address.

GUINEA TOUCH.—We cannot trace, but believe it is Messrs. Butcher's, Blackheath, S.E.

ANXIOUS.—The prints are moderately good specimens of portraiture, and they show promise of better things.

LENS.—We do not know the first-named series. A lens of the modern anastigmat type would be preferable.

D. BACHRACH (BALTIMORE).—We are much obliged to you for your interesting letter, to which we may refer on a future occasion.

LANCASTRIAN.—1. Great Windmill-street, London, W. 2. Rue Louis-le-Grand, Paris. 3. It will answer all your requirements.

HANS DANZER.—We should recommend you not to come to England, as the market is overstocked with labour of the kind you mention.

F. Y.; A. F.; TWENTY-THREE SHILLINGS A WEEK; AND OTHERS.—Many thanks for your communications; but, as you will see by a note on the previous page, we have closed the correspondence.

ADDRESS WANTED.—ANTIPODES inquires: "Could you give publisher's address of *The Australian Photographic Journal*?"—In reply, the address is 66, King-street, Sydney, New South Wales.

PRINTER.—1. With regard to the platinum (developing) bath, you had better follow the Company's instructions. They are exceedingly simple. 2. See the formulae for albumen toning baths in our ALMANAC for 1899.

COLLOIDIO.—You can only decide such a point for yourself by practical trial. There are several brands advertised in our ALMANAC. Personally we have found both home and foreign makes to fulfil your requirements; but it is against our rules to make the kind of recommendation you ask for.

HEINRICH'S GELATINE.—A. BAKER says: "Will you kindly give me the address of the agent in England for Heinrich's gelatine, also the foreign address?"—Messrs. Zimmermann, St. Mary-at-Hill, E.C., are, we believe, the English agents. The gelatine is made in Germany, and is only supplied here through the agents.

CHRISTOPHER.—It is against our rules to make recommendations such as you invite. Procure a copy of *THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC* for 1899, in which most modern instruments are described with sufficient fulness to enable you to come to a decision as to the best way of satisfying your requirements.

PORTRAITURE.—Perhaps your best plan will be to peruse Mr. Robinson's *The Studio*, and what to do in it. It is published, we believe, by Sampson Low & Co., St. Dunstan's House, Fetter-lane, E.C. As to a book on the "art of developing," we should recommend you to follow the instructions given with the brand of plates you use. Do that successfully, and you will not require any books on the subject.

STUDIO WALLS.—N. B. says: "Could you suggest anything to cover the sides of a studio? It is a slim erection (wooden), being meant for the summer season only. What I wish is something inexpensive that could be taken down at end of season. Paper or paint would be unsuitable, as the boards are rather rough, and open in some places."—We should suggest "match-boarding" the inside, or, next to that, canvassing and papering the walls. Either would be tolerably inexpensive.

MONCKHOVEN'S INTENSIFIER.—G. H. FORD says: "Re formula for Monckhoven's intensifier on p. 1049 of *THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC*, will you kindly let me know in your Answers to Correspondents, 1. for how many quarter-plate negatives the quantity given will do? 2. and how long the negative should be left in the B solution? 3. Also if the negatives require to be washed before they are put into the A solution?"—1. We cannot say, as we have never tried. By the way, two quantities of the solutions are given. The English measure is for one ounce the French for a litre (about thirty-five and a half ounces). 2. Until the desired density is obtained. 3. Yes, thoroughly washed, and thoroughly fixed before washing.

FERROTYPE DRY PLATES.—BAZAAR. Ferrotypes dry plates, ready for use, are supplied by Fallowfield. Magnesium powder and flash lamps are also supplied by the same house. With a little practice beforehand, you ought to succeed.

AVOIDANCE OF DISTORTION.—CYCLER says: "Would you be so kind as to give me information as to the following: Can I use a short-focus lens, as Zeiss, Series III., nine-and-a-half inch focus (8½ x 6½ it covers) to photograph bicycles whole-plate without distortion? I am rather afraid the wheels will look elliptical."—The lens will not give distortion. If it is, however, brought very close to the subject, the perspective will, of course, be violent and unpleasant, as, indeed, is the case with any lens, whatever its form.

BOOK ON SOLAR ENLARGEMENTS.—GABRIEL MOULIN says: "Will you give me some information where I can get a book on solar enlargements, or developed enlarged prints other than bromides?"—We know of no work dealing with the subject. Monckhoven's *Optics* is the best work on the solar camera. It was published by Hardwicke, Piccadilly, but we suspect it is now out of print. It, however, gives no information as to the preparation and manipulation of the paper. In this country bromide paper has quite superseded the old iodised paper.

CRYSTOLEUM PAINTING.—S. E. YORKE says: "Would you please answer me the following questions: 1. What paper would I require to make prints for crystoleum painting? 2. What toning bath? I have had several asking me to make them prints for the above work, and I cannot get the paper thin enough."—In reply: 1. Ordinary albumen paper is what is generally used. The back of the paper is usually, to a great extent, rubbed away with glass paper after the print is mounted on the glass. 2. The ordinary acetate toning bath is as good as any, but others will answer.

PROTECTING PLATINUM PRINTS.—A. M. says: "I have to supply six prints for panels in trade cart. Platinotype process would be used. Can you suggest any form for covering prints to keep from rain or splashes? Glass will not do because of jolting. Would mica 'glass' do, and where could it be procured?"—We doubt very much if mica sufficiently large for the purpose, and transparent enough, can be had any where. We should suggest transparent celluloid; or, perhaps, the prints mounted direct on the panels of the cart, and then varnished with pale copal varnish, or French-polished with white polish.

PITCH OF STUDIO ROOF.—REX says: "I shall be obliged if you will inform me what you think a proper pitch for roof of studio, width of same being twelve feet, and to be erected in open garden, north light available, and no buildings on south side. I have been advised to adopt what is called a third pitch, leaving only about five feet on opaque side of roof. Do you think I should be inconvenienced by mid-day sun by so doing?"—Yes, that will do very well. Some sun will get into the studio during the midsummer months, but that can easily be dealt with by blinds. It is only about the middle of the day that the sun will cause any trouble.

ALBUMEN PAPER.—ALBUMEN says: "Will you please answer me, through the medium of your paper, the following questions: 1. How is paper albumenised? 2. How is the above sensitised, and also the bath for sensitising? 3. Where can I buy paper albumenised, but not sensitised, in small quantities? 4. The name of a good book on the above subject. 5. Will the paper keep when albumenised but not sensitised?"—1. Simply float the paper on the albumen. 2. By floating the paper on the silver solution for from two to three minutes; 45 to 60 grains of nitrate of silver to each ounce of water, according to the amount of chloride in the albumen. 3. At Marion's, or any of the photographic warehouses. 4. There is no work devoted to the albumenising of paper, but all the old works, such as Hardwich's, &c., give formulae. 5. Yes, if kept dry.

COPYRIGHT; ALTERING THE FOCUS OF A LENS.—MOZAIC says: "I am about to make up a mosaic group (bush). Suppose I copyright the mosaic print, would that copyright cover the copyright of each separate figure in the group? I mean, suppose any one used a portrait of one individual in the group, could I proceed against him for infringement of copyright? I have an old cabinet portrait lens by Lerebours. I had a stop which slid in front of lens, but I thought I would improve it by making a slit-in tube, and putting diaphragms the same way as the modern portrait lenses, but it does not seem to give the same definition. Have I done wrong?"—We are doubtful if it will. We have a vague idea of a case some time ago in which, in a somewhat similar picture, it was ruled that it did not. Better make each individual portrait copyright. The stops of the lens are now in a better position than they were at first. If you use the lens with the same size stop in the centre as the one that was in the front, we think you will get equal, if not better, definition.

MARKINGS ON LENS.—H. J. M. says: "Will you kindly give me an answer in your Answers to correspondents column to the following difficulty? The lens which I have had many years has lately shown (round the edges of the glasses) flower-like markings, almost transparent, as if the cement between the combinations were crystallising, and the marking appears to be spreading. The lens is very useful to me for other than the Frena, and I should like to know what I can do to remedy it without having, unless absolutely necessary, to send it to the makers for remounting. I had thought of wrapping it up in cotton-wool and carefully warming in the kitchen oven. Do you think this is likely to succeed? What, in your opinion, would be the effect on the definition of the lens of this marking? Have you ever come across a case like this before?"—Evidently the balsam has given way. We should advise the lens being sent to the maker to be re-cemented rather than tampering with it at home. No doubt, the performance of the lens is impaired in its present condition.



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## EX CATHEDRA

IN these days of widely diffused knowledge regarding the minutest working details of photographic processes, it will probably strike the readers of this JOURNAL as anachronistic, if not incongruous, to be told that in the year of grace one thousand eight hundred and ninety nine albumen silver printing paper supplies the secret formula-mongers with the opportunity of plying a trade which, however it be examined, cannot easily escape a somewhat curious reputation. Yet such is the case. One way and another the secret formula-mongers have boxed the photographic compass, so to speak. They have traded in "secret" toning, developing, intensifying solutions, silver stain removers, emulsion formulæ galore, mountants, and so forth, culled in the majority of cases from the photographic papers. As a rule the formulæ are good and practicable, but occasionally we have come across instances in which a total lack of knowledge of the subject has been employed to attempt a downright swindle. Witness the case of the wily foreigner who, a year or two back, travelled the country with a rubbishy orthochromatising mixture, which he palmed off on many an unsuspecting photographer at half a guinea a bottle.

BUT all these things make an exclusive appeal only to the photographic as distinguished from the general public, to whom the secret albumen formula has long been persistently and, no doubt, profitably offered. The selection of albumen paper as a bait for the very large class which daily strains its eyes over the advertisement columns of the morning papers on the lookout for easy ways and means of adding to their incomes, is simply a master-stroke of genius. To speculatively inclined people, with a few pounds to spare and no inside knowledge of photography, how easy it is for the formula-mongers to dilate upon the ridiculously simple manner in which the paper is prepared, how cheap the materials, how gentlemanlike or ladylike—very often ladylike—is the occupation; what a valuable part of the secret is the preservative; what a large demand there is for the paper; how readily the editors of the photographic papers will give it a "lift up," and so on and so on. Cannot the reader see through the whole game as it is played off by the formula-mongers on the innocent widow or the gulleless clerk with that fatal "little bit of money" which she or he is laudably anxious to put out to profitable use?

\* \* \*

IF the reader will turn to p. 1048 of our ALMANAC for 1899, he will find a formula given, after mention of the usual silver bath, for a preservative, citric acid, to wit. This is substantially the secret formula which has long been on offer through the medium of an anonymous advertisement in the daily newspapers. To our knowledge, as much as 20*l.* and 25*l.* has been paid for it, plus working details, which can be found in half a score of text-books selling for from 6*d.* to 5*s.* each. Within the last year or so we have come across no less than four purchasers of this formula, all imbued with the ambition to supply photographers with sensitised albumenised paper. In the last five or six years we have received, we were going to say, scores, but certainly dozens, of samples of sensitised albumenised paper, the accompanying literature of which bore a strange and almost fatal resemblance to the very latest circulars that have reached us. Not one of these closely related brands remains upon the market to-day.

\* \* \*

THE hardest case of all that came to our notice was that of a widow lady, who, having spent the whole of her savings—



nearly 200%.—in an energetic attempt to persuade photographers to use her paper, reluctantly took our advice and discontinued an entirely hopeless business. The poor woman learned with surprise that she was one of many purchasers of the formula, that albumen paper had been an article of commerce for thirty or forty years, that the market was already well supplied with it, and that the probability of a profitable business being done in the paper was about as remote as the planets. We wonder how some thousands of our professional readers will receive the interesting intelligence that the majority of the many new and "best" brands of sensitised albumenised papers, samples of which have been sent gratuitously to them during the past five or six years, all have their origin in a common source—a familiar formula sold by means of an anonymous advertisement in a daily newspaper?

\* \* \*

RECENTLY all the documents relating to the method of business adopted by one vendor of a "secret" albumen paper formula have been placed in our hands. With the following sentence taken from a letter to a purchaser we, of course, were highly amused: "I should advise you not to let the editors of any of the photographic books know that you have only just been taught the business, and don't mention from whom you got your knowledge. Let them think you are thoroughly practical." We, for our part, think many things about this highly expeditious process of turning out "thoroughly practical" manufacturers of sensitive albumenised paper. For the present we withhold publication of these documents. They do not strike us as containing anything to which legal objection could be taken, although some of the statements that are made would not bear analysis. The practical instructions and working details have, of course, been published over and over again; but, notwithstanding this, they would not be dear at the price charged if the knowledge so vended were confined to one or two purchasers. This, however, does not appear to be the case. A great deal of albumenised paper is still used, and will continue to be used. But it cannot be gainsaid that the market is thoroughly well supplied with recognised brands of the paper. We are strongly of opinion that the introduction of numerous small makers, recruited from the readers of daily papers, who have no knowledge whatever of the conditions of photographic business, can only result in their finding out, sooner or later, that they have burnt their fingers in attempting to make money out of a thoroughly well-exploited printing process which, in these times, those having large capital and the keenest enterprise could only take up with the greatest possible risk.

\* \* \*

THE late Mr. Gleeson White, the accomplished writer on art subjects, was known to have much sympathy with photography in its pictorial and decorative aspects, and in recent years his kindly used critical powers were often called into service at some of the London photographic exhibitions and on other occasions. There is no doubt that, had he lived, photography would have found in him a constant and discriminating guide to the possibilities that lay before it. We are asked to draw attention to the fact that Mr. Gleeson White's unexpected death on October 19, at the early age of forty-six, precluded the making of any adequate provision for his wife and two children, and that, at a meeting of his friends

recently held, it was decided that a fund should be raised and applied for the benefit of his family. A committee of prominent artists has been formed for the purpose, and a first list of subscriptions has been printed. There may be some of our readers who would like to contribute to the fund, and we should be very happy to receive subscriptions on its behalf, or they may, if preferred, be forwarded to the Hon. Treasurer, Mr. H. R. Hope-Pinker, 22, Avonmore-road, West Kensington, W.

\* \* \*

MR. P. R. SALMON sends us from Nice the following interesting note as to the difficulty of obtaining photographs of the Queen: "I am staying here for about a week or so for the purpose of making a series of pictures illustrating Her Majesty's life here, and I must confess it to be a hard matter, as all the authorities are so dead against photographers. The Queen always wears a thick black veil, which is another great drawback, and one might almost as well photograph a bundle of black clothes. I have made many exposures, but nothing very satisfactory. On Sunday I counted thirty hand cameras outside the hotel; yesterday there were only nine. Mr. A. L. Henderson and I worked side by side yesterday, and afterwards I went with him to tea. He seems to have a pass everywhere, and walks past the sentries, whilst I am always stopped. Mr. Henderson and I, as far as I could see, were the only stereo workers." The mighty "A. L. H." may be envied for the splendid photographic opportunities he alone seems able to secure at Nice.

\* \* \*

WE have received the preliminary prospectus of the *Camera Obscura*, an illustrated international monthly magazine of photography to be published in four languages. The Editor-in-chief is to be Herr J. R. A. Schouten, and his colleagues are to be Maurice Bucquet (French Editor), R. Ed. Liesegang (German), Max Sterling (English), and Chr. J. Schuner (Dutch). Three of the foregoing names are by no means well known in the world of photographic journalism. The *Camera Obscura* is to be published in Amsterdam by Messrs. Binger Bros., and in London by Messrs. Williams & Norgate, 14, Henrietta-street, Covent Garden. The first number will be ready in June next. The magazine is to be illustrated, and, according to the prospectus which has been sent us, its pages will be filled with a great deal of interesting matter.

\* \* \*

A FEW years ago we had the opportunity of congratulating Mr. H. A. Chapman, the well-known photographer, of 235, High-street, Swansea, on his election to the honourable position of Mayor of that important town. We now learn that Mr. Chapman has recently been placed on the Commission of the Peace for the borough. We so seldom come across cases in which professional photographers are singled out for compliments of this nature that we are sure Mr. Chapman's professional brethren throughout the country will learn with satisfaction of the distinction that has been conferred upon one of their number. It is worthy of note, however, that although we rarely come across the name of a photographer associated with public offices, the very highest civic position in the world was once occupied by a photographer. We allude to the late Mr. George Swan Nottage, of the London Stereoscopic Company, who, some thirteen years ago, was Lord Mayor of London.



## CELLULOID VARNISHES.

THE question is very often asked as to whether there is any practical advantage in using acetone and similar solvents in making celluloid varnish over the frequently more easily available methylated spirit and ether; or, in other words, are the commercial slow-drying, and frequently evil-smelling, products, and those made by dissolving up old celluloid films equal? In answering the question, it is necessary to look at it from different points of view, and to consider whether what is required is a robust and perfectly impervious film, or whether one that presents a certain degree of porosity may not be permissible.

Taking the whole range of vehicles or solutions, from the standard commercial celluloid varnishes to ordinary collodion, suitable, we will say, for dry-plate work, we have a series of preparations presenting sufficient variety to satisfy the most fastidious, offering, as they do, every possible class of film from perfect impermeability to a beautifully even and porous condition not surpassed by the finest bibulous paper. With such a wide choice it is obviously possible, by judicious selection, to prepare a medium that will satisfy almost any requirements, and, at the same time, we do not think it would be very difficult to effect such a combination as will satisfy all the most stringent requirements of the photographer for negative-varnishing purposes. Primarily, the object of a negative varnish is to protect the negative, but, in effecting this purpose, very different conditions have to be considered.

In the very early days of paper and albumen negatives the necessity for varnishing did not make itself felt; but, on the introduction of collodion, the want became a crying one. But it was soon met by the introduction of simple spirit varnishes, or solutions of gum resins, amber, copal, and other substances in spirit, chloroform, or benzole, and for a long period the question of negative varnish was not one that gave much trouble. There were many of the old collodion hands, however, who objected to varnishing, and in comparatively recent years we have seen some of the earliest of collodion negatives, from which by no means insignificant numbers of prints had been produced, that were in perfect condition, although unvarnished. In cases of this sort, of course, a good deal must depend upon the character of the collodion, for very many samples of films absolutely would not stand such treatment.

But, as the collodion process gradually popularised photography, and large numbers of prints had to be produced from the same negative, which consequently underwent a good deal of rough usage, more attention had to be given to the varnish, not only in order to prevent direct physical injury, but also to protect the negative film from the action of the more or less damp-silvered paper with which, in printing "long runs," it was constantly in contact, with the result that, under the combined action of spontaneous decomposition and the action of light, the whole of the varnished surface was darkened or blackened until it became practically impervious to light. Under such circumstances it was customary to remove the old varnish by means of spirit, and after-revarnishing, if the operation were performed in good time, it restored the negative to its pristine condition. In milder cases it might suffice to remove the surface stain by rubbing with cotton-wool saturated with weak spirit containing a little cyanide of potassium. It has been placed on record that the negatives comprising the late Mr. William England's admirable series of

stereoscopic views of the International Exhibition of 1862 had to be regularly submitted to his remounting process once a week.

But the chief point in these early experiments was this, that the varnished surface became the surface of the negative, and, though perhaps of little value as a physical protection, it was all-powerful in taking up small stains, abrasions, and scratches, and what not, and more particularly the much-dreaded contact stain from damp albumen paper. It took the stain, and when the stain became too prominent a pledget of cotton and a little ether and alcohol would put matters right in a few seconds.

That contains the whole question of solvents in a nutshell. If you want a strong resisting waterproof varnish, dissolve your celluloid in acetone, or, better still, amyl acetate, and make it thick. If you want a less robust varnish, but still one that can be called impermeable, dilute the above with methylated spirit gradually, or, better, with wood naphtha; but, if you only want a good negative varnish that will thoroughly protect your film from moderate rough usage as well as from stains of all kinds, that is easy of removal, and, more over, that is cheap and can be made at home, take the following: Take old celluloid films, previously thoroughly cleaned and, cut into narrow strips. Place in a bottle with methylated spirit until they become perfectly soft, then add little by little methylated sulphuric ether of specific gravity .720 or .730 until just dissolved. After allowing it to stand for some time, thin it down to proper using strength with a mixture of equal parts of methylated spirits and ether. Ether is recommended in preference to acetone on account of its more rapid drying, and with a varnish of this strength we should use these with not the slightest probability of its showing any structural faults. When complete, the varnish is slightly opalescent, but this disappears when it dries on the glass.

So far as collodion was concerned, this constituted the whole difficulty, but when gelatine plates came into vogue it was soon recognised that the conditions were materially different; but chiefly it became plain that the varnish, instead of soaking into the negative film, and forming, as it were, part of it, remained isolated on the surface, with very little adhesion, and certainly without forming any sort of protection, since the underlying negative film was the stouter and tougher of the two; but, when we add to this that the so-called protective varnish retained its semi-crystalline and porous nature while the negative film remained at least partly soluble in water and amenable to its influences, it needs little reflection to show that the effect of wet or moisture upon varnished gelatine negatives was found to be infinitely more disastrous than if no protection had been attempted.

Numerous were the remedies attempted, but perhaps the most useful, and at the same time the most common-sense, was the plan of coating the negative first with collodion to form a basis for the varnish to hold on to, and afterwards varnishing. In practice, the latter portion of the process soon came to be omitted, and to the present day very many workers follow no other caution than that of coating the negative when dry with good transfer collodion. The immediate effect of the coating of collodion was to render the gelatine film practically independent of most of the damp troubles that hitherto existed, for, even if the protective film were porous enough to allow moisture to pass, it was flexible enough to admit of the gelatine swelling freely, and then resuming its original form, instead of splitting up and disintegrating the varnish, as was formerly the case. This was the first step in the direction of



a celluloid varnish, inasmuch as it was the first attempt to introduce a preparation with a gun-cotton basis.

The next step may also be said to be in the direction of a celluloid varnish, though developed in an entirely different manner. After very many futile efforts to produce a perfectly impervious varnish, it was discovered that the end was partly, though by no means perfectly, obtained by mixing collodion and ordinary negative varnish in such proportions that they did not mutually precipitate or decompose one another—that is to say, no proportions short of those where the pyroxyline would be precipitated by excess of spirit or the gums precipitated or “chilled” by the presence of too large a quantity of ether. Naturally it was a task of some delicacy to arrive at the very best combination possible, but it was very easy to recognise that each successive small addition of varnish to ordinary transfer collodion very materially improved its protective power without in the last interfering with its structural qualities or flowing powers. At any rate, we have seen twenty years or more ago more than one such sample of varnish that was little behind celluloid in quality. We believe that the Autotype Company actually placed varnish for gelatine negatives on the market that was prepared on somewhat this principle.

#### Lubricant for Glass Stoppers and Stopcocks.—

One of the most annoying yet frequent occurrences in dark-room work is to find that some particular stopper has become so fast as to render its loosening a matter of difficulty. To obviate such trouble, an excellent plan is to lubricate all stoppers with vaseline. There are, however, circumstances under which this substance is inefficient, and Mr. Francis C. Phillips, in the *Journal of the American Chemical Society*, has been studying the question, with the result of devising a perfect lubricant. The conditions it should satisfy are: It should adhere to glass, and not be loosened by water; it should be little affected by changes of temperature; it should not be saponified by alkalis, and should be sufficiently translucent, when used with a stopcock, to render visible any clogging of the aperture in the plug, and to show whether air spaces exist between plug and wall of cock. He gives two mixtures: 1. Melt 70 parts of pure caoutchouc, and stir in 25 parts of spermaceti and 5 of vaseline; in winter a little more of the latter should be used. 2. The same proportion of caoutchouc melted, and then stirred with 30 parts of unbleached beeswax.

**Photography at Funerals.**—The ubiquitous photographer seems to be cropping up everywhere and on every occasion, and often not much to the credit of photography. One of the most recent dodges that has come under our notice by report is that of photographers attending at cemeteries to “snap-shot” the mourners at the grave while the funeral service is proceeding, on the speculative chance that copies of the photographs may be purchased by the different mourners. We have just said that the “dodge” came under our notice by report; and so it did in the first instance. But it was our painful duty a week or two ago to attend the funeral of a dear old friend at a suburban cemetery, and we were passed on the road by a local photographer on a bicycle, with a camera case on his back, followed by an assistant on another cycle, with the stand and other paraphernalia, tearing along at a “scorching” speed. After the service was over in the chapel, and on arriving at the grave, we noticed the camera planted so as to command a view of the last sad ceremony—and the photographer at work. We are pleased to say that, on this occasion, the ubiquitous photographer’s work, commercially, was futile, as the proofs were received with disgust, also that the photographer is not likely to have anything more to do for the bereaved family. Would it not be well for District Councils to put a stop to this kind of thing by speculative photographers in the cemeteries under their control unless they attend on a special com-

mission from the owners of the grave, as it is repugnant to the feelings of most of those whose painful duty it is to attend funerals of departed friends, unless, indeed, they have extremely morbid tastes.

**Precipitation of Gold by Charcoal.**—In reference to the description of this process lately noticed in these columns, a suggestion is made in *Nature* by Mr. James C. Richardson to the following effect: “By some process, accelerated, no doubt, by surrounding physical changes, there is formed within the charcoal carbon monoxide (and also carbon dioxide), which is a precipitant for gold. . . . I may mention that I am now using carbon monoxide as an industrial precipitating agent in gold-winning.” The writer of the original note appends a foot-note stating “that the idea of carbon monoxide as the precipitating agent is an old one, and that the main objection to all the theories put forward to account for the charcoal precipitating the gold is that they are not supported by the results of any published experiments.”

**Pyroxyline Mirrors.**—An extremely ingenious method, devised by Mr. A. Mallock, of making perfect plane mirrors of a diameter up to and even exceeding two and a half inches in diameter, was communicated to a recent meeting of the Royal Society by Lord Rayleigh, who thought they would be extremely useful where good definition and extreme lightness were desired. It may be imagined that they would answer admirably for reversing purposes in a camera, a true plane mirror of that size being ordinarily a somewhat costly affair. The mirrors are formed by stretching the thin films left on a surface of water after a few drops of a solution of pyroxyline in amyl acetate has been poured upon it, and allowed to spread there over rings whose edges have been ground to a true plane. The contraction of the film in drying causes it to approach so closely to the plane in which the edge of the ring lies that, when used as a reflector, the definition is equal to that obtained from a worked glass surface of the same area, at any rate until the film is more than two and a half inches in diameter. A two-inch mirror may be made weighing considerably less than ten grains. Mr. Mallock’s chief difficulty lay in silvering the films, and he had not entirely overcome it. Success in this point seemed to depend entirely on securing extreme surface cleanliness, both of the films and the silvering bath, the films being in this respect enormously more sensitive to surface tension influences than glass.

**More Spurious Paintings.**—Some time ago we alluded to the discovery, on the Continent, of a manufactory of spurious pictures of well-known artists, and to the fact, as reported, that many of these fictitious works had found a home in some of the principal private collections of America, they having been purchased at a price that should have ensured their genuineness. Now the *Vienna Neue Freie Presse* warns the public that spurious pictures, bearing the forged signatures of the Viennese painter Leopold Karl Müller, who died some years ago, are being offered for sale as originals alike in England and America. It is a little significant that in all these disclosures of spurious works of art the principal purchasers are American and English. It is a notorious fact that there are in existence more works by the old masters than they ever painted; also, that doubts are thrown on the authenticity of some of them in our national and royal collections. Sometimes photographs of these works are issued, and are therefore accepted as reproductions of the work of the masters whose name they are reputed to bear.

**The Turner Exhibition.**—A few weeks ago we called attention to the fact that a loan exhibition of Turner’s works was to be held at the City Art Gallery, Guildhall. The Exhibition was opened by the Lord Mayor on Monday last week, and will be open to the public free, daily, Sunday afternoons included, for some months. This Exhibition is specially instructive to photographers in more ways than one, and it is the first time that so many works



of this famous artist have been shown side by side in one and the same gallery at the same time, hence the student has the opportunity of seeing and comparing the artist's work at different periods of his life. It is well known that Turner's earlier work was very different from his later productions, and many prefer the former to the latter.

MUCH of Turner's later work was very broadly treated, and in some respects his style has been affected by photographers of the Salonistic type, though Turner, it may be said, did not revel in "dismal swamps," mud flats, and suchlike subjects. He luxuriated in brilliancy and vivid colours, perhaps to a greater extent than many appreciate. There is one point in this show that is especially interesting to photographers, namely, that many of the pictures on view have been engraved by some of our most famous engravers, and the prints are familiar to all. It is therefore instructive to compare the engravings, while the opportunity lasts, with the originals and see how the engraver has translated the brilliant colours of Turner into monochrome, and whether they are in accordance with what has been laid down as the theoretically light values of the various colours. Amongst engravers there has always been a divergence of opinion as to how certain colours and tints should be rendered in monochrome, and not all seem to be in accord with the theory. Photographs of many of the pictures have also been published, and it will be interesting to the photographic student to see how the colours have been translated by photography and compare them with the originals and the engravings from them. Many persons, we know, prefer some of the engravings to the originals. As we have just intimated, this Exhibition is of special interest to photographers, and probably such a complete collection of Turner's works will never be shown again, so that the opportunity of seeing them should not be lost.

#### ON THINGS IN GENERAL.

THE London and Provincial Photographic Association often manages to have papers of practical value on what might yet be termed every-day subjects, the value of the papers being estimated not entirely on their own merits but on that of the discussion that follows. Indeed, they may be often likened to Archbishop Whately's well-known edition of Bacon's *Essays*, in which there is a vast amount of annotation to a small modicum of essay. I was led to this train of thought by a recent paper read at the Association, and the attendant discussion on the different aspects of the question of good *versus* bad lenses. Now, every one knows that one man with artistic feelings could, with a piece of tin with a pinhole for a lens and a cigar-box for camera, produce photographs of a far more interesting and artistic character than another who made use of the very latest things in dear lenses and the highest class of wood-work in cameras. Yet, because the results in the former case were so good, the latter so poor, it would be idle to infer that in a general way the tin pinhole was the lens to be chosen by the comparatively impecunious amateur. So, in regard to Mr. A. T. Harris's arguments against the use of high-class modern lenses in favour of cheap ones of limited capabilities and feeble rapidity, the fact that many "exhibition pictures" have been taken by the latter is no argument in favour of their selection by the amateur. I am happy in remembering many pictures in the older exhibitions that could not possibly have been taken with a "landscape lens," and, when the present craze for very rough surface work has had its day, we may be quite sure that plenty of prints will be shown that are evidently the work of large apertured lenses free from astigmatism. The discussion was pregnant with terse statements—some true and new, some new and not true. I leave it to my readers' unaided perspicuity to say to which category belongs Mr. Everitt's statement that it was "possible to get a picture of a fast-galloping horse in one-five-hundredth of a second in which even the hair of the animal was defined." Many of us will remember Ruskin's saying that in a particular drawing "Turner's pencil did not move over the thousandth of an inch without meaning," and, when accused of extravagant hyperbole, Ruskin made an excellent defence, which is worth any one's while to look up if he can obtain access to

*The Literary Gazette* for November 13, 1858. I should much like to hear Mr. Everitt's defence of the statement that an animal's hair could be defined while the animal moved through a space of about half an inch during the exposure.

Speaking of lenses reminds me of a mild criticism I made in my last letter regarding an extraordinary pronouncement attributed to Mr. Dallmeyer. Now, no one can ever accuse "Free Lance" of writing with a pen tipped with gall. Influenced by a spirit of camaraderie, I took no notice of numerous errors from the same source, which were obvious slips of the pen that had escaped a careless printer's reader; but, when a respected name in optical science was, in effect, held up to ridicule, I felt bound to interpose a word of warning. It would have been far better for the writer to have admitted a pen slip than to have attacked me in the manner he did and landed himself in further error, which he could not put down as clerical. However, notwithstanding all that, I will quote out of the essays aforesaid where Bacon wrote: "It hath been an opinion that the French are wiser than they seem, and the Spaniards seem wiser than they are," and will assure my readers that the writer in question is like Bacon's French, and is wiser than he seems, as shown in his Dallmeyer dicta.

One of the most remarkable discussions that has ever appeared in a photographic journal is that lately appearing on assistants. Heaven forbid that I should speak lightly of the cruel injury and wrong done to assistants by robbing them of their specimens, though, as I have before said, their losses in this way are not infrequently attributable to their own carelessness in regard to distinguishing and marking their work when sent away; but when a man airs his grievance to the effect that he has applied several times for places without success, and sometimes without getting a reply, I am tempted to exclaim, Where has the man been vegetating up to now? In the fierce race for bare existence that characterises the present time, fortunate is the man out of place that has not to wait weary months, if not years, to get in again, unless his capabilities are high, and then, to express the Editor's words by a common apophthegm, "the best is bound to come to the top." Let the complaining assistant interview any large employer of "gentlemanly" labour in the guise of clerkships and ask his experience when he advertises for a clerk at a guinea a week—"1000 applications," he will probably be told. Yet to become an efficient clerk requires years of drudgery before sufficient skill is obtained to be able to get a market for it. How difficult, then, in a time of admitted depression in what may be termed photographic industry, must it be for a really competent man to obtain employment, still more difficult for the man who can do work [such only as could be done by any schoolboy with a few months' practice. It is, unfortunately, too true that the very first principles of business are utterly unknown to unfortunate men of this kind. What is their labour worth? What is any labour worth, efficiency in which can be obtained by a year or two's practice? Not as much as a crossing-sweeper's earnings. If a man is determined to rise in his profession, to become specially skilled in his work (this not to be taken on his own valuation), to study the science and the theory of what he does, he will probably succeed. Every first-class photographer knows that, if he advertises for an assistant, he gets scores of applicants from men of the highest capacity, judged by their own standard, but a few solitary and single applicants of real skill, judged by his own standard. A photographer who can't do anything better than a lad of a couple of years' experience won't get as much as a bricklayer, and, candidly speaking, is not worth it.

I have just spoken of want of knowledge of elementary principles of business matters. Photographers, as a rule, are very deficient in such knowledge. Some of the cleverest photographers I have known have been miserable failures when they have gone into business on their own account simply through lack of business knowledge or training. I believe that, as "poets are born, not made," so it is with business men. Still, training will sufficiently make up for natural inaptitude to enable a good man to run a successful studio. Could there be a better example of this than the wail of the writer under "Business Disputes" in the Correspondents' column for April 7? He buys a business on the strength of the returns for the previous



two years, and, finding his own takings do not amount to half this sum, now wishes to repudiate the last instalments of payment of the purchase money simply on these grounds, although he knows that the seller's old operator has opened an opposition shop close by! Such diminution of returns may afford grounds, of the slightest, for suspicion that the returns shown him may have been falsified. Let him have them examined by an expert if he likes, but before that is done to assume at once that he has been cheated is actually monstrous.

"H. M." last week ends his letter with wise and weighty words. He says, "To an extent unknown in any other science, the knowledge of the many has become the knowledge of the few." Gelatine dry plates owe their existence to a clever amateur. Who will ever forget Bennett's photographic "snap-shot" of the woman emptying a jug of water, which first conclusively proved the possibilities of gelatine emulsion work for rapid exposures? His methods were freely given, but, as "H. M." says, the improvements made by the wholesale producers are now guarded jealously by manufacturers as secrets it would be ruinous to divulge.

When I speak of amateurs I mean amateurs in the true sense of the word, not nondescripts such as the one who recently sued a customer before a County Court Judge for the price of an enlarged photograph he had supplied. Quoth the Judge, "Why do you call yourself an amateur photographer if you are doing that for money?" The nondescript one replies: "I am not in business." "Not if you are making photographs and selling them?" "I mean," says the plaintiff, "that I don't earn my living by it." To which the scathing retort was made by his Honour: "It seems absurd to call yourself an amateur;" and a little later he told the "amateur" that he had been parading as a jay in peacock's feathers. Do these "amateurs" include their amateur earnings in their income-tax returns, I wonder?

FREE LANCE.

## PORTRAITURE.

[A paper read before the Edinburgh Photographic Society.]

THE subject which I deem it my privilege to bring before you to-night is a well-worn one; but, as two people seldom entertain identical ideas on one subject, I may perhaps be able to give some details which my experience in portraiture has enabled me to acquire. Edinburgh has, from the very earliest days of photography, held a prominent position with regard to portraiture, and I need only here mention the well-known name of D. O. Hill, many of whose admirable works can be held up as examples to the present day. In fact, if we come to study the question, I doubt if our up-to-date professional photographer would find that he had made progress adequate in proportion to the facilities which are placed at his disposal. Take, for instance, the infinite variety of textures available in paper, and the wonderful improvement which art and ingenuity have invented in the methods of printing and in the science of optics, and last, but not least, in the marvellously increased speed of the sensitive film. My verdict is, we have not. I can recall some of the meetings of our brethren in the seventies, when all our energies were directed towards the obviating of streaks, oyster-shell markings, and pin-holes resulting from the silver bath; and when we take into consideration that the present photographic generation has been relieved of this, and numerous other difficulties, for the past fifteen or twenty years, it seems that a corresponding amount of study has not been accorded to the art side of photography.

Portraiture, you will grant, is by far the most difficult branch of our art. Take any other object as a subject for the camera, and, with sufficient technical knowledge, the obstacles are by no means insurmountable; but what else in creation can compare with the human countenance for mutability and variety of change? Health, temper, frame of mind, or dress, are but a few of the contending difficulties which meet the professional photographer, for to combine a pleasing portrait with a true likeness must be our end and aim. As our subjects are seldom perfect, it is necessary to keep constantly before our mental vision a distinctly ideal form, so that when deformity presents itself, or even a slight deviation from our idea of perfection in the human form divine, we may be able to discreetly modify the defect by the various means at our disposal, without entirely obliterating any point which may tend to spoil the individuality of our sitter, and so attempt a deceit which is a distinct violation of the rules of true portraiture.

## DIFFERENT POINTS OF THE FACE.

I think that most of us are cognisant how very unmerciful photography at times is apt to be; but, if we can only bring our artistic knowledge to bear upon the difficulty, it is often more easily solved than we should imagine.

Shall we look for a few moments at the different points of the face, remarking, first of all, on the mouth.

This is perhaps the feature, and especially in ladies, which requires the most careful observation, and on no account should the mind of the subject be influenced to a consideration of it, or a total destruction of the natural lines will probably be the result. Much may be learned from a cursory conversation with a sitter, during which an opportunity is gained of observing the delineation of the mouth when in animation or repose. In many instances the youthful female mouth may be treated with the lips apart, but in this case a full illumination of the opening is necessary, as the tendency in photography is to obtain too dense a shadow, thereby destroying the delicate transparency that we admire in nature. Children's mouths are a fascinating study, with their beautiful, soft, mobile lines, full of a sweetness and repose seldom or ever to be found out of childhood. Unfortunately for photographers, however, this ideal expression is not the one most generally appreciated by the loving mother or auntie who may accompany the juvenile sitter, and a grin which distorts the mouth into a grin extending from ear to ear is more likely to meet with their favour. With advancing years the susceptibility of the mouth to change is more apparent than in any other feature. The development of characteristics, the results of certain habits, the circumstances of joy or sorrow, all tend to leave an indelible mark upon this most tell-tale feature, leaving compression of lips, and destroying with lines and twists the delicate mobility of youth. All this calls for our careful consideration in portraiture, and demands our utmost skill in dealing with it. For instance, a twist may often be modified by a judicious pose of the head, and I shall make a reference later on to the treatment of lines.

## THE MOST ATTRACTIVE FEATURE OF THE HUMAN VISAGE.

And now to pass on to the most attractive feature of the human visage, which is indisputably the eye.

Again I must revert to the child. Here we find the eye abnormally large, a fact accounted for by the growth of that organ not being in accordance with other features. Both in children and adults this charming feature cannot receive too much attention, for here you have to deal with the "windows of the soul." All our most interesting subjects have fine eyes. While on this subject, it is useful to remember that a certain latitude is allowed in the higher art of painting with regard to the size of the eye. But this is not a concession that we can apply to the photographic art. There are, however, certain conditions in our practice which tend to an opposite result, unless we are on our guard, among which I may mention the indiscriminate use of light as being the most guilty factor, and it should always be borne in mind that too much light has the effect of dwarfing the eye. Stray lights are also detrimental, and are frequently caused by the mischievous use of white reflectors placed in too close proximity to the sitter. The seat of sweet feminine character is in the outer corner of the eye, and more particularly on the lower lid. Our greatest portrait painters fully recognised the importance of this most telling feature, for, when receiving or parting with their subjects, the eye was always the first and last to attract their attention.

We have now dealt with the two leading points of the face wherein mainly rests the expression, and the treatment of the other features, viz., the nose, chin, and ears, must depend on the judicious point of vantage which can only be selected by the photographer after a study of the contour of his sitter's head. The ugliness of a face may be decidedly modified by choosing either full, three-quarter, or side view, and the calling into requisition of the charm of light and the mystery of shadow, remembering that the naked truth is deceitful.

Comparisons are proverbially odious, and in comparing the works of portrait painters with those of the photographer it has been remarked that the latter only gave "the soot of the flames" (the subject of the criticism was perhaps printed in carbon), the reference being made to the extreme difficulty of securing an intelligent expression by photographic means. We are, however, consoled by the thought that the painter has many advantages which are denied to the photographer; and, if the painter be endowed with mind, he has ample opportunity of calling forth the mind of his model, while a machine cannot evoke a soul. This is supposed by many to be the true relationship of photography to art so far as portraiture is concerned, and so we must be content to



worship afar off, and if we cannot evoke souls it is still permitted to us to exercise the little mind we may have at our disposal towards the consideration of the other portions which go towards making a complete picture, and we will therefore now consider the background.

#### THE BACKGROUND.

With regard to this subject, as showing the importance of the background with relation to the figure, Rubens is reported to have said to the person who recommended to him his son as a pupil sufficiently advanced to be competent to paint his backgrounds, "If he can do that, my friend, he stands in no need of my instruction."

The late Mr. Gleeson White, while editor of the *Studio Magazine*, wrote an article, which appeared some time ago in the *Photogram*, taking as his subject, "The Use of Dark Backgrounds in Photography," and I am proud to say he honoured me by selecting some of my studio work to illustrate his ideas.

But, to return to the practical view taken by the majority of our portrait workers of this all-important subject, it would seem that it is the one point which receives the least attention of any, and I feel sure that, if it were to receive the careful study due to it, portraiture would advance by leaps and bounds, and we should no more have our eyes offended by the incongruous productions which meet our view in the various shop windows.

A young English photographer waited upon me in my studio some time ago, and apologised for troubling me, trusting I should have no objection to him taking a look round. In the course of conversation I asked him if he had any specimens of his work with him, whereupon he produced a packet of cabinet portraits for my inspection. The weak points in them were immediately apparent, all the pictures being taken with a background of an equal grey tint, against which all the ugly lines of the figure were shown up to perfection. I returned his packet of photographs in discreet silence, but, in answer to his earnest solicitation for my opinion on them, I conducted him to my front window, and pointed to a building at the foot of the Mound, where he could spend an hour with great advantage, recommending him at the same time not to trouble as to the light or treatment of the heads, but simply to study the manner in which the figures rested against the backgrounds. I had not the pleasure of another visit from that gentleman, but I heard indirectly of his safe arrival home with his ardour slightly damped. Velasquez, Vandyke, Reynolds, and Raeburn afford the intelligent student ample opportunity for studying what is most desirable to achieve; at the same time I regret to say that we labour at an art which has its limits.

From a photographic point of view, difficulties often present themselves which seem well-nigh insurmountable, for figures often require adjustment to a certain background, which we have neither the power nor time at our disposal to paint according to our idea, and the effect which we have in view must therefore be accomplished in some other way. This may be done by placing our background at different angles to the light, and shading certain portions of the figure. For example, if the outline on the shadow side of the head will not bear emphasis, the tone of the background at that particular part must be equal in depth to the shadow, so that the two blend. This leading principle applies to the whole marginal line of the figure, and it thus follows that we must have a clear conception of which points in a subject to emphasise and which to subdue. This also accounts for the reason why so many eminent portrait painters finish the heads of their models before proceeding with the background, or even deciding on the ultimate arrangement for the pose of the figure, so that in commercial portraiture it is almost impracticable to secure always an absolutely harmonious effect.

#### FASHION AND PHOTOGRAPHY.

The attire of the subject is one of the most important items when considering the background.

If the drapery is graceful and becoming, it will bear greater boldness of treatment, and may with advantage be allowed a place in the picture second to the head.

But one of the photographer's most serious barriers in the way of artistic effect is the constant contending with ugly fashions, the sleeve not infrequently proving a most troublesome point, its shape and size influencing in a large degree the scale of the head. The large full sleeve, which, I regret to say, has just become a thing of the past, was, in my opinion, admirably adapted for the square bust portrait, although it certainly had the disadvantage of emphasising the defects in short stout figures when full-length pictures were required. The present style of sleeve calls for special treatment, and only in exceptional cases is

becoming. The arm usually emerges from a tuft of satin, or other stiff material, about the size of a breakfast roll, and in bust portraits the short piece of arm which appears between the fulness of the sleeve and the lower margin of the picture seldom looks well.

But these and other vagaries of fashion are good tests for the photographer's powers of composition.

#### CHILDREN'S PORTRAITURE.

Children make delightful pictures, their simplicity and serene unconsciousness being qualities which lend themselves readily to the painter's brush or the less pretentious camera; but to do them justice in either painting or photography needs a special study and love of infantine life. Reynolds was a great lover of children, otherwise our eyes could never have feasted on such art-treasures as *Lady Smith and her Children*, and many others.

His child models were, however, invariably well dressed, and here again, as in adults, the photographer is met with a blank wall of opposition. A new stiff or starched dress is a garment usually brought into requisition for the important occasion, when an old, soiled, or flimsy frock would, doubtless, have been the very thing could the unhappy photographer have made his own selection. In the case of very young children, the neck and shoulders should always appear, although there is a danger of making the head abnormally large, unless discrimination is used in allowing the dress to fall below the shoulders, thereby giving the appearance of greater width.

If the usual short frock is used, nothing is prettier for a child than a full-length figure standing alone, especially if taken from a low elevation, which gives the little subject dignity, and shows to advantage the limbs, which are always interesting; but this is, doubtless, the most difficult portrait to secure with any amount of success. The charm of our daily work with children is the constant anticipation of what may next reveal itself.

I will conclude with a few words as to the practice of retouching. As in landscape work, so in portraiture, we get too much detail; but, while not for one moment losing sight of the fact that all the predominant darks in the face are conducive to likeness, yet the excessive details which make their appearance on the intervening spaces can bear modification, as such detail is only troublesome to the eye, and not of service as regards the likeness; but, when the retoucher directs his energies to the wholesale removal of the darks, then the likeness at once begins to suffer. You remember my reference to seat of sweetness in the female eye, and, if the fulness under it is removed, with it goes all the poetry.

WILLIAM CROOKE.

#### OZOTYPE.

SINCE Mr. Manly read his paper on this process before the Royal Photographic Society many experimentalists have given it a trial, with more or less success. Some, however, have found that the image has not been so sharp as the negative, it having a somewhat blurred appearance—much as if the paper had been put upon the wrong side of the negative. Now, it is quite conceivable that, under certain conditions, this may be the case, because the action of the light on the sensitised paper is transmitted to the unsensitised carbon tissue, and this action may extend laterally and thus cause a blurring of the finer details, particularly with a thickly coated paper and a thickly coated pigmented tissue. We have as yet had no time to experiment with the process, so cannot give our personal experience of it. In the results that have come under our notice the ordinary single-transfer paper and carbon tissue have been used, and it is quite possible that the gelatinous coating of one or both papers is too thick for this process, and thus permits of a lateral spreading of the light's action in transmission. If this should be the case, the remedy would seem to be to use a more thinly coated paper for the actual printing, and a tissue containing a large proportion of pigment and a small amount of gelatine, i.e., a highly pigmented tissue. Of course, in every fresh process, difficulties are to be expected at first, and in this instance we do not for a moment imagine that they are insurmountable.

#### WITH QUEEN AND CAMERA AT CIMIEZ.

BEING sent on a journey to "photograph the Queen and her surroundings" is not such an easy matter as may be supposed, especially when she is staying in a foreign land; it is a mission that bristles with many difficulties. The French Government are naturally very anxious for the Queen's safety when she visits the south of France, and the utmost precautions are taken to ensure this. Sentries are duly posted round the



grounds and building of the Hôtel Regina, the patrol makes its rounds, and there are frequent marchings to and fro of the bands with their escorts, which all make extra difficulties and add to the show of military force.

Photographers, however, have not so much to be afraid of the soldiers as of M. Paoli and his large corps of plain-clothes officials, which includes some of the sharpest men from the detective force of Paris. It is their business to be all eyes and ears, and not to be heard, until danger threatens or they think it does. They are in all sorts of disguises, and lounge about as if they didn't care a button what happened next; but just act a little suspiciously, and you will cause these fellows some uneasiness. I am using, amongst other cameras, a  $7\frac{1}{2} \times 5$  (stereoscopic) hand camera, which, with its six double backs and leather case, makes it weigh rather heavy. Where I cannot use a stand camera I use the hand. To set up a stand camera in front of the Queen's private entrance would be madness; so, when I thought no one was looking, I hid my case and slides in the grounds of the Grand Hôtel (next to the Regina), but at a place where I could keep an eye on them and watch if any one touched them. I then walked past the Queen's private entrance and "snapped" it, then went back to put my camera in its case, but it was gone! One of M. Paoli's eagle-eyed friends had—I don't know how—obtained possession of it; but, on proving that I was a harmless Englishman, I got it back.

Before the following incident, I should have mentioned that I had orders to stay one week and get what was possible. First of all I went to the English Consul—one of the politest consuls I have yet met—who told me that he could do nothing for me, but that I was to write to the Queen's Courier—Mr. Dossé—who had in hand all Royal matters. I wrote, and in reply obtained a nicely worded letter, saying that photographing was strictly forbidden in the Royal apartments and in the grounds. The first two days I spent getting what pictures I could, and during that time I noticed many people who were visitors to the hotel (the Queen has the west wing) walking in the garden, and so I thought it possible that I, too, could do the same, even if I went to the extra cost of staying for a day or so at the hotel (I was staying at Nice, about two miles away). A letter, however, to the manager brought a favourable reply, which told me that I might enter the garden any time when the Queen was not therein. This was fortunate, as I was able to add considerably to my stock of pictures, and, moreover, could get an excellent "pitch" when the Queen left the hotel for her afternoon drives.

On the third day I was about the hotel as usual with my camera, when a French detective came up to me and said that I had been about there for three days, and it was time I departed for good. On this occasion I did not understand French, and accordingly shook my head. This rather annoyed him, I think, for he looked round to see if there was any one who could speak English, and, finding none, he took hold of my camera and gave me a sharp push. I still clung to my camera, and by degrees got out of his grasp. I then walked away—straight into the gardens, and up to the Royal balcony. Oh, that man's look, and the noise he made! Within less than a minute there were half-a-dozen detectives and two soldiers running, as for their lives, to the garden entrance. They were coming for me, I knew that, so I sat calmly down and got out my permit from the manager. They arrived, and seized hold of me, and just at that moment an English-speaking detective arrived. I said nothing at the time, but held up my permit. I shall never forget the look on their faces—I felt sorry for them, for they were only doing their duty, but with monkey madness, and not in a quiet, gentle sort of way. Every day after that, I entered the garden and photographed without any objection whatever.

The number of hand cameras about here is enormous. One day I counted thirty when the Queen drove out, but I have only seen two tripods in use—my own and that of a well-known member of the London and Provincial. Photographers here all grumble because Her Majesty wears such deep black veils; it is almost impossible to see her features, let alone to photograph them. Authorities say it is because of the sun and dust, but may it not be as a foil to photographers? The photographs on sale here are as a rule faked. The Queen's face is white compared with the others in the carriage—generally Princess Henry of Battenberg and Princess Victoria—who do not very often wear veils. At the Diamond Jubilee all photographers blessed that sunshade; here is also a sunshade and in addition a thick black veil. Stereoscopic cameras are well in evidence, for this is in France, be it remembered, where stereoscopic work is popular. Stereoscopic views are for sale in nearly all the windows, as also are stereoscopic post cards.

RICHARD PENLAKE.

#### THE PACKING OF P.O.P.

At the London and Provincial Photographic Association, on April 6, Mr. A. Haddon referred to a question discussed three weeks ago touching the packing of some gelatino-chloride paper. Briefly, the facts are these: Some P.O.P. was sealed up in zinc cases, which were soldered with an acid flux, but, on reaching its destination in East Africa, it was found to have gone to different depths of a mahogany colour, which action the makers ascribed to the fumes driven off in soldering with an acid flux. Mr. Haddon did not think that the fault lay with the zinc. He was

reading an article by Professor Burton, writing from Formosa, in which it was stated that English plates as a rule did not reach him in the best of conditions, while plates of German manufacture did. The explanation advanced for this was that each dozen was packed in an hermetically sealed zinc box. According to what was said at the time this matter was being discussed, every one, he thought, came to the conclusion that plates were far more susceptible to alteration from emanation from the zinc than was paper. He did not know for certain what fluid the German maker used for soldering, but imagined that it was hydrochloric acid or zinc chloride, in which case exactly similar fumes would be given off when sealing up either plates or paper. We have a definite statement that no deterioration in the plates followed this course; and, further, that the only plates which reached Mr. Burton in good condition were those which travelled in zinc boxes. To return to the matter of the paper which was returned from Mombasa, and of which he showed two sheets, one much darker in colour than the other, he thought some few experiments which he had conducted might be either of present or future interest. The condition of the paper suggested to him that it would be a useful direction in which to experiment if he took up the task of restoring the paper to its original state, or, at least, making it once more serviceable. He therefore submitted the paper to the action of certain reagents, which would restore the paper to as nearly as possible its original colour. Chloride of copper or acidified potassium bichromate were used, and a piece of the darker of the two papers so treated was now shown in comparison with an unchanged portion. The colour was largely discharged, but paper was left in only a feebly sensitive state. To remedy this and restore sensitiveness, some absorbent of chlorine was required to be added. It would be found that a brushing over of the paper, after bleaching as described, with either acid citrate of silver or nitrite of potash, effected this object. A print on a piece of the least-stained paper showed, notably in the sky, how much the paper was improved by bleaching in the manner described. Mr. Haddon then exposed a piece of paper to daylight until it was as dark as it could go, and bleached it in chloride of copper, followed by bichromic acid, but, strange to relate, this treatment did not restore to the paper its original whiteness. One end he then brushed over with nitrate of potash, and the other end with acid citrate of silver, leaving the central portion untouched. The influence of the chlorine absorbents was plainly visible in the prints, but by daylight the paper, in this case, showed a peculiar violet colour. Mr. Haddon's experiments were of an interesting character, and may prove useful in saving paper which has lost its whiteness in one way or another.

#### [INSECT PHOTOGRAPHY BY ARTIFICIAL LIGHT.

At the London and Provincial Photographic Association, on April 6, Mr. T. E. Freshwater gave a few short notes on a simple method of photographing insects by artificial light, and showed a large number of examples from specimens in his own collection. He used an ordinary camera and tripod stand, with this modification, that a tilting board was introduced between the two, the object being to enable the lens to be pointed downwards at right angles to the usual position for that instrument. The only other apparatus called for was a small glass-topped table, about fifteen inches high, a convenient substitute for which would be found in an inverted stool with a slab of stout glass (preferably plate) laid over the feet. The tripod is placed so that the lens and camera overhang the centre of the glass table. The object to be photographed—butterfly, beetle, moth, &c.—is placed on the glass table, and, if it be of a dark colour, a piece of light-coloured paper is put on the ground below the table, so as to form a contrast and throw the object into relief. The same effect is obtained with a light-coloured object by using a dark background. The image can then be focussed on the ground glass to an approved scale, after which steps may be taken to expose; magnesium ribbon, giving actinic rays approximating to daylight more than anything else applicable, is preferable. It is burned near the lens, away from its field of view, in such a manner that any shadow of the object may be cast to one side, such a shadow in the picture generally being very unsightly. By having the glass table, the shadow would, in most cases, be lost on the background. In lighting the object, care should be taken that one side is not more brightly illuminated than the other, and this may be done by burning the ribbon as high up as possible and as nearly as may be above the object. In photographing a series of insects, where it is important that relative size should be true, they should be all taken with the same extension of camera. The exposure constitutes the crux of the question. Unless properly lit and properly exposed, the negatives will be worthless. If one had time, daylight would be preferable; but many had little daylight to spare for these experiments. About seven inches of ribbon, with a rapid, thickly coated plate, is usually enough to give a good representation for detail, gradation of light and shade, &c., and for the developer pyro soda was commendable. Chloride of paper was perhaps the best for the print, giving as it did a bright image. His own work was done with a Dallmeyer stigmatic lens. Little stopping down was recommended,  $f/11$  serving well as a rule. As regards the use of orthochromatic plates, he was not sure that they were needed, some photographs of butterflies like the Red Admiral and the Painted Lady being rendered well enough with



an ordinary plate. None of the specimens need be taken off their pins. Any reflection may be prevented by blackening the heads, and they may be stuck into a piece of cork on the glass table during operations. Books, manuscripts, &c., are equally well negotiated in the above manner.

### SOME NEW POINTS IN PLATINOTYPE PRINTING.

On Friday, April 7th, the members of the Leeds Photographic Society foregathered at the rooms in the Philosophical Hall, Park-row, Leeds, to hear the Rev. J. Beanland, M.A., lecture on the above interesting subject.

The President (Mr. Godfrey Bingley) having introduced the lecturer, the latter remarked that he might commence his lecture first of all by saying it was not so much new points he specially desired to draw the attention to as to correct wrong impressions in connexion with the working of the paper. At the outset he wished to correct the idea that the process was a difficult one to work. When he commenced the study of photography, on the advice of a professional friend, he started to print with platinotype, and he had stuck to it ever since.

The whole secret of the successful working of the paper was careful attention to details. His advice to them was not to avoid a single detail in connexion with the printing of platinotype paper. Personally, he usually bought a three-sheet tin containing seventy-eight  $5 \times 4$  pieces. Before printing, he took the back of the frames out, and put them inside the fender with the cloth part towards the fire. He used a piece of maintosh at the back and dried it before the fire, and the secret of any little success he had had was by paying strict attention to the details, which were not irksome when they had got into the habit of doing them. If they had a negative that would give a good silver print, they might rely on it as giving a perfect platinotype print. It was probably the easiest of any paper to work. They could do as they liked with it; print from a harsh negative and get a soft result. This could be done in half a dozen ways—one way by shading the picture and reducing harshness; another way by developing with a brush, and the oxalate developer mixed with glycerine on the parts we should call the whitewashed parts, and the solution very much let down to the sooty part. A further way was to turn your print where the extra detail was not of much consequence, using a strong solution at the back of the print, force up every particle of the image, and then turn it round to the front. He had been asked by many platinotype-workers how he accounted for the black salt following the brush when using it, or leaving the paper when put into the developer to develop. His answer was that he had never had that fault with platinotype printed in the shade. It had nothing to do with the water; but, if the paper was printed in bright sunshine, it got hot, and caused the sensitiveness to leave it.

There was another erroneous impression he would like to correct. It was said the paper was more expensive than P.O.P. He had gone into the matter carefully, and found that the cost of printing, toning, and fixing four dozen half-plate P.O.P. prints cost about five shillings, and, after making allowances for failures, they might reckon on getting thirty successful prints; with platinotype, the same number, half-plate size, with chemicals, cost 7s. 6d., and the average number of successful prints might be put at forty-five.

Workers were now using sodium phosphate instead of potassium phosphate, and with the cheaper chemical they got identically the same result. Developing the D salts with potassium or sodium phosphate, you get those lovely cold tones that nothing can touch. If they had any doubt as to the paper being damp before printing, it could be dried before the fire; and put into the developer a little potassium bromide, and the result would be that the moisture would be considerably lessened and the damage minimised to a considerable extent.

The prints could be toned when finished, and there were half a dozen toning baths which could be used—uranium, or any of the ordinary developers; but he recommended Thomas's formula to give a good tone to a platinotype print. One that he specially desired to draw their attention to was platonic chloride—a fifteen-grain tube in fifteen drachms of water; tone and acidify it with any of the chemicals they liked.

In conclusion, he thought he had said sufficient to show them how this paper might be successfully worked.

A formal vote of thanks to the lecturer brought a most interesting meeting to a close.

### THE BUILDING OF A PICTURE.

At a meeting of the Leeds Camera Club, on Wednesday, April 5, Mr. W. E. Tindall, R.B.A., gave a lecture on "The Building of a Picture," illustrated by lantern slides shown upon the screen. The lecturer dealt with the definition of the word "picture," showing that a picture should be something to convey to the mind the impressions of others received from the beauties of Nature. The architecture of early times left large spaces on the walls, and the frescoes that were then painted upon them were to fill up these spaces, and the only difference of to-day is that we now fill our spaces with movable or detachable pictures, whilst theirs were not portable or detachable. The object, then, of a picture should be to show a remembrance of some subject, and pleasing to the eye. For purely artistic purposes, painters undoubtedly drew largely on their

imagination, but there was no greater delusion than that they could sit down and dash off a sketch which might be enlarged and elaborated without trouble. Art is governed by certain rules, and no artist who respects himself can afford to neglect them. It is independent of the subject, as the most ordinary thing, when touched by a genius, is infused with the highest charm, and the artist must be in perfect sympathy with his subject. The lecturer dealt very fully with the importance of unity in composition, harmonious in idea, and dominated by a motive, and said that in their photographic work they should endeavour to get one leading idea to show the keynote of their picture when finished, so that it might not be just so many trees, rocks, or bracken stalks. In the relation of light and shade, it might be taken generally that two-thirds of the picture should be in light, the other third dark; in a varying degree, their highest light in the lightest part, the deepest shadow in the darkest part. It was a mistaken idea to force the highest lights by contrast with the darkest shadow; it destroyed unity, and made the picture spotty. Many other points were dealt with, and a series of slides to illustrate the studies in the building of the picture *Peter the Great*, by Mr. Seymour Lucas, were exhibited, after which he showed slides from the works of the great masters, and pointed out the lessons to be derived from their study.

### KODAK FILM IN SPECTROSCOPIC PHOTOGRAPHY.

SIR NORMAN LOCKYER has lately been experimenting, and very successfully, with flexible film, with the idea of adapting it to spectroscopic photography. The large concave Rowland grating which Sir Norman Lockyer is now using for his solar spectroscopic photographs has 2000 lines to the inch ruled on its surface and is of  $2\frac{1}{2}$  feet radius, giving a spectrum of 30 inches long. The focal plane of this grating is of necessity considerably curved, in fact the plane of accurate definition at the edges of the field is about 0.5 inches in front of the similar plane at the centre. It is therefore impossible to get a sharp photograph of the whole spectrum on a glass plate, in fact not more than 18 to 20 inches of the spectrum can be brought into focus on the same plane. This difficulty is, of course, got over by the use of a flexible film, which can be bent to the curvature of the field.

The Kodak Company have sent us a print of one of Sir Norman's photographs taken with this Rowland concave grating. It is thirty inches long, and shows the arc spectrum of iron with a comparison spectrum of the sun from wave-length 3600 to 5200. Sir Norman Lockyer also hopes that, by using films instead of glass plates at the next solar eclipse, he will be able to obtain a greatly increased number of photographs, owing to the rapidity with which the film can be shifted in the short space of time available for photographic operations. At the last eclipse the photographic work was concentrated on obtaining a series of photographs of the chromosphere both about the time of beginning and end of totality. By careful drill Mr. Fowler and Dr. W. J. S. Lockyer were both able to secure ten photographs at each of these important periods, the time occupied in making each series of ten exposures being twelve seconds. An apparatus for carrying films is also being designed which can be adapted to the spectroscopic cameras at present in use in the laboratory and observatory.

### AT THE CAMERA CLUB.

With Chief Justice Rayner, of Lagos, in the chair, and Mr. Alfred Lloyd on the platform to give an illustrated account of his experiences in Africa, and more especially his dealings with the inhabitants of the Pigmy Forest, the Camera Club was assured of a very crowded room. Mr. Lloyd's adventures were the topic of many newspaper articles a few months ago, and many will remember that, as an *attaché* to the Church Missionary Society, he spent some years in the very heart of Africa, mixing with the tribes and learning their language. But it is another thing to see the explorer in the flesh, and hear him tell of his wonderful adventures, and more interesting still to see projected on the screen the various snap-shots which he had taken with his camera. It cannot be pretended that these were fine examples of photographic art, but they were taken under all kinds of difficulties; the boxes which contained the undeveloped plates were occasionally dropped in rivers, or trodden on by stampeding elephants or buffaloes, and the merest tyro knows that such treatment is not good for embryo negatives. Had it not been that we were made aware of these accidents by flood and field, we should have put Mr. Lloyd among that numerous class of explorers who take with them photographic apparatus with very little knowledge of what to do with it. We are bound to say, too, that Mr. Lloyd makes a mistake in having his slides coloured. A good picture, well coloured or rather tinted, is admissible, but when the slide is a poor one, and the colourist has taken upon himself to paint in details which are wanting—a pair of eyes here and a mouth there—he is apt to produce a rather ludicrous result. This was the case with some of Mr. Lloyd's pictures.

The traveller started on his long journey at Zanzibar, and traversed the great African continent from east to west. He came upon the camps occupied by Mr. Stanley in his famous journey, but generally took new routes, and found himself in districts never before visited by white



men. Stanley had an army of followers, but Mr. Lloyd had with him, during the greater part of his travels, only two dusky companions. It is true that he started from Zanzibar with 500 men, but several deserted and several died from fever, so that, when he arrived at the Victoria Nyanza Lake, twenty-five only remained to him. After this he was able to borrow small escorts from the various villages through which he passed; but, as we have already stated, he eventually found himself with a bodyguard of two.

For two years Mr. Lloyd found his home in one village, where he learned the language and made friends of the natives. Here he had some singular experiences, two of which we may recount. He showed a photograph of some two hundred natives, black as ebony and shining as if they had been French-polished, squatted on the ground, and waiting to see him in the early morning. This was a common experience, for the natives have a firm belief in the efficiency of European medicines, and most of these poor creatures were afflicted with some disease or other. At this rate the stock of medicaments was soon exhausted, and the traveller found himself in a difficulty. The idea occurred to him that very little would satisfy these children of nature, so he hit upon the device of tearing up bits of old newspapers and gumming them on to the sore places. As a result the crowd gradually dispersed, each man having stuck upon his body a bit of *Times* newspaper.

The other experience was of a more delicate nature. A young woman made a daily practice of visiting him, each time bringing with her an offering of fruit. This was most acceptable, but, at the same time, the recipient wondered what it all meant. By questioning some of his "boys," he discovered that the young woman's aim was matrimony, this being the peculiar way in which a bachelor was approached in that part of the world. He got out of the difficulty by quietly hinting to the young lady that whites did not enter into marriage contracts with coloured people, and the matter dropped.

It was after this two years' sojourn that Mr. Lloyd commenced his memorable journey towards the Mountains of the Moon and the Pigmy Forest. During most of the time he had to depend upon his gun for food, waterfowl and monkeys forming the chief part of his diet. Coming to the territory of Uganda, he made the acquaintance of Mwengi, the king of that country, of whom he showed a photograph. This picture was noteworthy because it included, besides the king, a man crouching behind his chair. It seems that this monarch had a suspicion that the camera would bring him some harm, and he therefore caused another man to share the risk, so as to diminish that which threatened his imperial self.

The chief interest of the narrative was centered in that portion which dealt with the Forest of Pigmies, and it was disappointing that no photographs of the interesting little people were forthcoming. This was readily accounted for by the fact that the forest is so thickly planted that the sun's rays never penetrate the foliage, and nothing would induce the pigmies to step out into any open country that was adjacent to it, nor would they keep still for a single moment in order to allow of a time exposure.

Mr. Lloyd evidently did much valuable work on behalf of future explorers, for he gained the confidence of the natives with whom he came in contact, and showed them that white men travelled for other purposes than those of mere conquest and spoliation. It must be regretted that his photographic efforts were not more fortunate, for a series of negatives representing peoples and countries hitherto unknown to civilised humanity would have been invaluable. At the same time, it must be remembered that this intrepid explorer carried his life in his hands, and it is a matter of congratulation that he has returned to his friends unscathed, for he has spent many months in a country inhabited by cannibals and lawless savages, and has encountered besides lions, leopards, crocodiles, and other wild fowl which certainly do not add to the security of existence.

#### YORKSHIRE PHOTOGRAPHIC UNION.

A MEETING of the Committee of Delegates in connexion with the above Union was held at the Grammar School, Bradford, on Thursday evening, April 13, when the voting papers, which had been circulated by Mr. Ezra Clough, the Secretary *pro tem.*, were handed in, and, on a scrutiny of the same, the following gentlemen were elected officers of the Union:—President: Mr. Percy Lund. Vice-Presidents: Mr. Godfrey Bingley (Leeds Photographic Society), Dr. Hollingworth (Hull Photographic Society), and Mr. Rowntree (Scarborough). Business and Recording Secretary: Mr. Ezra Clough. Assistant Secretary: Mr. J. C. Coultas (Leeds). Treasurer: Mr. Jackson (Keighley).

The proceedings throughout were of a most enthusiastic and harmonious character, and in the hands of such a well-known body of officers the success of the Union seems assured.

A sub-Committee, consisting of Messrs. Briggs, Coupland, Clough, and Coultas, were appointed to arrange a date for the annual excursion, which will be held at an early date, probably June 14 next, at Selby. It was also decided that the Secretary print and circulate a list of the available lecturers to the secretaries of the various societies, members of the Union, as soon as possible.

In regard to the criticisms which have been from time to time made as to where the two free lectures, to which all societies who join the Union are entitled, were to come from, it transpired that the Committee have sufficient lectures now at their disposal to successfully carry out this desirable object.

#### NOTES FROM THE WEST OF SCOTLAND.

THE question of the permanency of photographic prints has been somewhat prominently brought forward in Glasgow recently, and several of our leading photographers have been giving the matter their closest attention. In one instance, where the experience of a leading portraitist is concerned, the matter has gone so far as to lead to the exclusion of all printing papers having a gelatine base, permanency being deemed of the first importance in connexion with all the photographs turned out from this studio.

An important prosecution came under the Petroleum Acts recently in one of the Glasgow Police Courts, when the manager of a large engineering company was fined in the modified penalty of 10*l.* for permitting six cylinders of calcium carbide being stored in the company's yard. There would appear to be considerable difficulties in connexion with the introduction of acetylene gas in studios as well as for other commercial purposes, and no doubt, were it not for the stringent rules imposed by local authorities, this beautiful light would be in more general use than it is, especially for photographic purposes. Still, however, it steadily progresses in favour both for the lighting of studios and other commercial purposes, a striking instance of the latter being its adoption by one of the local railway companies for the lighting of their fleet of coast steamers, upon which it has given entire satisfaction.

Long-distance excursions are becoming popular with our local amateur workers. Doubtless, these are prompted by the very moderate week-end railway fares that are now established all over Scotland. A large contingent, taking advantage of such facilities, quite recently made an excursion into Northumberland, making Alnwick their chief centre. The trip is very highly spoken of.

Lantern operators, especially those who understand the benefits derivable from a good pressure of gas being brought to play upon a heavily packed mixing jet, will be glad to learn that an improved form of fine-adjustment valve will soon be placed upon the market. Several of the best operators in cinematographic projection have entirely discarded the use of regulators and taken to fine-adjustment valves, the reason being, no doubt, the unlimited amount of pressure they can command with the latter when used as cylinders.

The decision given by Sheriff Spens in the recent action against the Shettleston Camera Club has given much satisfaction to photographers all around the West of Scotland. Had Sheriff Spens not ruled the action incompetent, the case would most likely have gone before a jury, incurring considerable expense; as it is, even much sympathy is expressed for the Shettleston Camera Club having to pay extra judicial expenses under such uncalled-for circumstances.

#### A FRAUDULENT PHOTOGRAPHER.

At the Rutland Quarter Sessions recently, John Lee Dadford (54), photographer, was indicted for unlawfully and knowingly, by certain false pretences, obtaining the sum of 2*s.* 6*d.* in money from Tom Peckett, at Oakham, on December 9. He was further charged with similarly obtaining the sum of 2*s.* 6*d.* from John McIlvride; and also a like amount from Annie Davis.

Mr. A. W. Tuck prosecuted.

Tom Peckett, butler in the employ of the Right Hon. G. J. Noel, Catmos, said accused came to the house on December 9 last, and asked for permission to photograph the place, which was allowed. He then offered to take witness and his fellow-servants, and they were grouped at the back of the house, where prisoner went through the usual process of photography. He took them twice, but he did not change the slides in the camera at all, but after the second time he looked into the camera, and said it would make a very good picture. He and the others paid prisoner half-a-crown each for a copy of the photograph, but he never received one. He should not have paid the half-crown if he had thought the prisoner had not actually photographed them.

Inspector Wilson said he apprehended the accused at Wood Green Police-station, and, when charged with the offence, he said he had been very ill, and he had lost his wife, which had nearly driven him mad. He added that, if the people proceeded against him, he hoped something would happen to make them wear a band on their arm, the same as him. He said the negatives were at Enfield.

Prisoner went into witness box, and said he took negatives as stated with a proper camera, and plates, and he had them with him, but they were undeveloped. He had been locked up since his arrest, and had therefore not had the opportunity of getting the negatives prepared, or he should have shown that there was no swindle about it. He had sent for them, and had only received them the previous day, but until they were de-



veloped they could not be produced. A statement to the same effect, written by the prisoner, was read.

Mr. Tuck called the attention of the jury to the fact that prisoner, from December 10 to February 17, when he was arrested, had the opportunity of developing these negatives, but he did not choose to do so.

The jury found prisoner guilty, and he also admitted a conviction for misdemeanour at Bristol Assizes, in February 1896.

Mr. Tuck said he had been instructed to call the attention of the Bench to the fact that the police had received a tremendous number of complaints from all over the country against the prisoner about this sort of thing, and the conviction recorded against him was for offences of an exactly similar character.

The Chairman said they had only gone into one of the cases against him, and no doubt the jury had done perfectly right in finding him guilty, and if he persisted in this sort of thing he would probably be sent to penal servitude. He had been in prison six weeks awaiting his trial, and he would now have to go back again for nine calendar months, with hard labour.

## Our Editorial Table.

### THE THORNTON-PICKARD SHUTTER WITH TIME-EXPOSURE VALVE.

Manufactured by the Thornton-Pickard Manufacturing Company, Altrincham.

WE have had placed before us a specimen of the latest make of the famous Thornton-Pickard time and instantaneous shutter. This is in mahogany, and a careful inspection of it shows it to be a beautifully finished piece of photographic cabinet ware which works like a charm. The shutter is fitted with a speed-indicator, showing it to have an exposure range of from one-fifteenth to a ninetieth of a second, and it also allows



of time exposures being given by the adjustment of the lever at the side.

The novel feature of the shutter that is deserving of especial mention is the time-exposure valve, fitted to the pneumatic tube, which permits the photographer to give short-time exposures of  $\frac{1}{15}$ ,  $\frac{1}{20}$ ,  $\frac{1}{30}$ , 1, 2, and 3 seconds. This facility is obtained in the following manner:—

A pneumatic ball screws into an air-escape valve, to which, at the other end, is attached, by a screw connexion, a rubber tube.

A small hole is pierced in the air valve to allow of the air escaping,



and upon the face of the valve a circular revolving disc is screwed to regulate the air escapement. An arrow mark or pointer is engraved on the centre of the valve face, and, to obtain any of the various exposures marked upon the revolving disc, it is only necessary to turn the disc until the number indicating the required speed is opposite the fixed pointer, set the shutter for "time" in the ordinary manner by placing the shutter lever opposite the word "time," then, holding the ball in the palm of the hand, give the ball a decided squeeze, and maintain the pressure until the exposure is completed in precisely the same manner as at present.

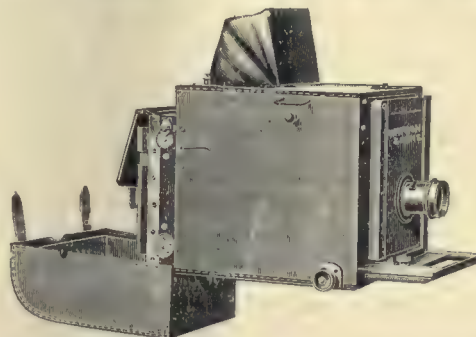
Thus, with the practical certainty of obtaining with the new time-exposure valve accurately measured exposures from one-eighth of a second to three seconds, a valuable power is placed in the hands of the photographer, who has hitherto had to give such exposures by pure guess-work. The Thornton-Pickard shutter, thus improved up to date, is the perfection of what such an instrument should be.

### THE GAMBIER-BOLTON CAMERA.

Manufactured by W. Watson & Sons, 313, High Holborn, W.C.

If any one's experience in photographic work should be worth embodiment in the production of a hand-and-stand camera, we need not trouble to look beyond Mr. Gambier Bolton to supply it. He has for years been photographing animals at home and abroad, in circumstances and amid surroundings of peculiar difficulty, and so he may be quite safely depended upon for advice in the choice of a hand camera, which shall be a reliable tool for enabling one to turn out good work, and not the mere toy of the occasional dabbler.

Mr. Bolton puts his advice into the concrete form of a hand-and-stand camera, now being introduced by Messrs. Watson, the points of which may be gathered from the following description:—It consists of a mahogany box, covered with black leather, to be used with one lens. It has rack-and-pinion focussing for lenses of six-and-a-half inches focal length and upwards; a square Thornton-Pickard focal-plane shutter built into the back of the camera, rising motion to the front, and a reversing frame at the back, for either vertically or horizontally shaped negatives; doors divided in half, to open on hinges (to the sides of the camera) by



pressure on a small "push knob" on the front (of the top) of the camera; a loose focussing frame for use when the camera is fixed to a stand. Immediately in front of the shutter, and inside the camera, is a large but light mirror, which reflects the whole of the image thrown on to it by the lens (the right way up) on to a full-sized, square, ground-glass finder on the top of the camera. On this ground glass the object to be taken can be focussed with the greatest accuracy, as round the ground glass is a four-sided dark chamber, which cuts off every ray of light not necessary for focussing purposes. The exposure is made by pressure on a round "push knob" near the back (left side) of the camera, the focussing screw being on the right side and near the front of the camera. This pressure on the "push knob" releases the mirror, which flies up swiftly, and directly it has cleared the top of the plate it discharges the shutter automatically, and the exposure is made. The mirror is then turned down again by the brass handle on the top (right side) of the camera, and "snaps" audibly when it is in its proper position. A dark slide can always be carried in its proper position in the camera, ready for immediate use, and the shutter of the dark slide can be kept drawn out—when the camera is in use—the whole of the back of the camera being encased in a leather cover, which, being hinged at the bottom, falls down when unfastened at the top, and when a plate is being changed. A small square door at the back of this leather cover is used for focussing purposes when the camera is fixed to a stand for "time" exposures, thus doing away with the inconvenient focussing cloth altogether.

An inspection of the camera and a study of the manner in which it is worked persuades us that it is just the thing for the hand-camera worker bent on serious photography. You carry your camera with a plate always ready for exposure, and the full-sized finder image perpetually in view. One simple movement dislodges the reflector from the axis of the lens and releases the shutter, and your exposure is made.

The practical details and minutiae have been well thought out. We can cordially recommend the Gambier-Bolton camera to those requiring a simple, efficient, and workmanlike instrument.

### CATALOGUES RECEIVED.

FROM Mr. Henry F. Purser, of 33, Hatton-garden, E.C., wholesale agent for the lenses of the Rathenower Optische Industrie-Anstalt (late Emil Busch), we have received a supplementary list of new lenses which his Company are introducing to the English market. These include the



following series: A wide-angle aplanat, working at  $f/15$ ; the periplanat,  $f/9$ , giving an angle of  $80^\circ$ , suitable for portraiture and landscapes; cinematograph lenses, working at  $f/4$ ; projection lenses and Universal sets on the casket system. The Buech lenses are both cheap and good, and we have seen many most excellent photographs produced with them.

Taylor, Boxall, & Co., 86, Lewin-road, Streatham, S.W.

MESSRS. TAYLOR, BOXALL, & Co.'s list gives prices of the various kinds of work they undertake, viz., bromide enlargements on paper and opal, carbon enlargements, finishing and painting enlargements, mounting, ivory miniatures, pastels, &c.

MESSRS. TAYLOR, TAYLOR, & HOBSON, of Leicester, send us a copy of their new catalogue of lenses. The volume includes an excellent paper on "The Principles of a Lens Action," and a new form of tables of conjugate foci. In addition to the Cooke portrait lenses, Messrs. Taylor, Taylor, & Hobson now include the smaller Cooke lenses, Series V., which have the same aperture as lenses of the rapid rectilinear type. Reference is also made to a new focussing mount and the Cooke extension lenses.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
24.....	Bradford Photo. Society .....	<i>The Joys and Sorrows of Photography.</i> P. E. Newstead.
24.....	Camera Club .....	An Evening with the Biokam, an Amateur Cinematograph-taker, Printer, Projector, and Snap-shot Camera combined. T. C. Hepworth.
24.....	Ile of Thanet .....	Lantern Evening: Prize Slides.
24.....	Oxford Camera Club .....	Exhibition of Slides by well-known Workers. Lent by the Royal Photographic Society.
24.....	Richmond .....	Hand-camera Work with a View to Enlargement. John H. Gear.
25.....	Birmingham Photo. Society ..	Exposure and Development. E. Child Bayley.
25.....	Hackney .....	J. W. Turner, R.A. W. Rawlings.
25.....	Leeds Photo. Society .....	Stereoscopic Photography. Jas. Taylor, L.D.S., R.O.S., E.D.
25.....	Royal Photographic Society ..	Demonstration: The Making of Glass Diaphragms, Thin to Newton's "Very Black" Stage. Thomas Bolas, F.I.C., F.C.S.
26.....	Croydon Camera Club .....	Autotype. James Packham, F.R.P.S.
26.....	Leeds Camera Club .....	Annual Meeting.
26.....	Photographic Club .....	Defects and Remedies. E. Dockree.
27.....	Ashton-under-Lyne .....	Exhibition of Cameras and Discussion on the Relative Merits of Stand-and-hand Cameras. Opened by Samuel Woolley.
27.....	Camera Club .....	Lecture and Demonstration.
27.....	London and Provincial .....	Open Night.
27.....	Oldham .....	Demonstration. J. Wrigley.
27.....	Woolwich Photo. Society .....	Pictorial Photography. A. Horsley Hinton.
28.....	Croydon Microscopical .....	Exhibition of Lantern Slides of the Riviera. Mr. Crowley.
28.....	Leigh .....	Business Meeting.
28.....	West London .....	Members' Lantern Night.
29.....	Ashton-under-Lyne .....	Excursion: Knott Hill to Limehurst. Leader, W. O. Brown.
29.....	Borough Polytechnic .....	Excursion: Pinner and Ruislip Woods. Leader, F. W. Bannister.
29.....	Hackney .....	Excursion: Bostal Heath. Leader, H. W. Dunkley.

### ROYAL PHOTOGRAPHIC SOCIETY.

APRIL 18.—Photo-mechanical Meeting.—The Right Hon. the Earl of Crawford, K.T. (President), in the chair.

#### A "BRACKET" CAMERA STAND.

Mr. E. M. SMITH exhibited a bracket camera stand, intended to replace the tripod when photographing in awkward situations. It could be attached to a window-sill, balustrade, ladder, fence, &c., the camera being affixed to a platform capable of an extension of about four feet by telescopic movement and permitting the direction of the camera upward or downward or at any desired angle.

#### APPARATUS FOR HALF-TONE WORK.

Mr. W. GAMBLE exhibited some of Messrs. Penrose's latest apparatus for use in the photo-mechanical processes. The first was a screen and plate-holder, intended for attachment as a dark slide to any existing camera, for small workers who do not care to go to the expense of a large camera especially for half-tone work. The shutter being of the draw-out type, and a ground-glass screen being provided, the focus could be adjusted with the screen in position; and there was an ingenious rack-work motion for setting the screen distance. Another exhibit was a new prism box possessing great accuracy. The manufacture of prism boxes from thin sheet metal, making the back and sides of one piece and then fixing on the ends, and also by using several separate pieces, had not been found satisfactory, and the present exhibit had therefore been made by making a solid brass casting of the  $90^\circ$  angle of the box, and planing it with great accuracy, so that it was practically as true as a set-square; it was then

a simple matter to slip in the prism and cap the back of the box. It was arranged to screw on the front of the lens, the hood and cap being placed on the front of the box, the result being a very neat, compact, and accurate arrangement. Mr. Gamble said he had recently been able to get prisms which would read on the spectrometer to absolutely  $90^\circ$ , and he could read to half a second.

A new form of arc lamp was also shown, adapted for use on a stand, or by hanging in any desired position or at any angle.

Mr. A. HADDON asked the diameter of the graduated scale by means of which Mr. Gamble could read up to half a second of arc, and how he tested the absolute planeness of the surface of a right-angle prism?

Mr. GAMBLE said his spectrometer had a seven-inch diameter of scale, and he took the reading first by rotating the table, and then by rotating the telescope and taking the mean of the two readings. For testing the flatness of prisms, he had a plane parallel plate of quartz, which, when pressed into contact with the surface of the prism, showed Newton's rings very plainly; if the rings were irregular, and not concentric the prism was not flat, but the evenness of the rings was a fairly good indication of the flatness of the prisms. The quartz plate was five millimetres thick, and it was, of course, necessary that it should be parallel and plane.

The conversation next turned on the subject of the preservation of mirrors, Mr. IGNATZ HERBST saying that he found it necessary to resilver once a fortnight or oftener in London, and once a month in the country.

Mr. W. E. DEBENHAM suggested the practicability of enclosing the mirror in a box, one side of the box being screwed as nearly as possible airtight to the lens, and the other side having a glass flap fitting against a rubber flange, a small tray of chloride of calcium being enclosed. The flap need only be opened during exposure, and the mirror would thus be kept in a dry box.

Mr. GAMBLE thought this a good idea, but the difficulty would be to get the operators to close the flap after use. He thought they would generally leave it open.

#### ELECTRIC TRANSMISSION OF PHOTOGRAPHS.

Mr. AMSTUTZ showed some examples of work done on his electro-artograph engraving machine. He said that some twelve years ago he commenced original research upon the subject of the electric transmission of pictures, and was able at that time to take a relief photograph and transmit it electrically to considerable distances, reproducing it at the receiving station in the shape of an engraving ready for printing purposes. So far as he knew, the first work in this direction was done in 1850 by an Englishman, Mr. Bakewell, who was followed by Casella, whose apparatus was brought into actual use in France and Russia. Casella prepared sketches in outline, by means of an ink consisting of shellac and alcohol, on very thin sheets of tin, so as to make an insulating surface; a small stylus was made to travel over the plate, and when it touched one of the insulating lines the circuit was broken, and when it dropped upon the conducting surface the circuit was complete. This system, however, needed an expert artist of both ends, and the result when received had to be engraved by hand before it was ready for printing. Mr. Amstutz made a carbon print upon celluloid, and fastened it to a drum at the transmitting station, a similar drum being placed at the receiving station; a delicate stylus was arranged to travel over the print, the relief of which caused the stylus to be raised or lowered in varying degrees, and it was connected with a multiplying lever which actuated other mechanism, so that, when the stylus was at the lowest point, the current on the line leading to the receiving machine was strongest, gradually reducing as the needle rose on the higher parts of the picture. At the receiving point the varying strength of the current pulled a V-shaped graver into a coating of wax, celluloid, or gelatine, on the drum, and the picture was thus interpreted in parallel line upon the receiving machine, the engraving so made being ready for immediate mounting and printing, or a stereotype could be made from it. The electrical parts of the system, as it at present stood, were simply those used for ordinary Morse transmission, the length of the dots and dashes being controlled by the lights and shades of the picture. The carbon reliefs shown by Mr. Amstutz, as used for transmission, were inspected with much interest and admiration, but he had no transmitted prints for exhibition, as he did not wish to enter into details as to some features of the receiving apparatus.

#### COMING EVENTS.

April 25, Technical Meeting. A demonstration of the making of glass diaphragms, from "thin" to Newton's "very black" stage, by Mr. T. Bolas, F.I.C., F.C.S. May 9, Ordinary Meeting. "On the Photography of Colours," by Mr. Sawyer Shepherd.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 13.—Mr. R. P. Drage in the chair.

Mr. EDWIN BANKS referred to a formula recently published by Professor W. K. Burton for a combined toning and fixing bath. Coming from such an authority, it would naturally carry considerable weight amongst photographers, for which the speaker was particularly sorry, seeing that any combined bath was necessarily sulphur toning and nothing else, and, if so, why should not sulphur toning be done properly? Mr. Burton's theory, on the face of it, looked plausible enough. His aim was to maintain the neutrality or slight alkalinity of the toning bath, and to this end he added powdered chalk, which remained inert unless the bath showed a tendency to become acid. Mr. Banks thought it was a question whether such a bath would give any deposition of gold at all—if any, it would be very slight, and further stated that one could get all the colours the bath would give by the use of a hypo bath in which there was no gold at all. In the early days, when the sel-d'or bath of hypo and gold was much in use, it was known that pure sel-d'or would not tone; it required something to upset its equilibrium before toning action could follow. In the same way Mr. Banks said he had been curious to ascertain if Mr. Burton's neutralised toning bath gave any action. He took a print and washed it so that all acidity was removed, and found that no action took place when the paper was treated with the neutral.



toning bath; but, where not previously washed, the action was instantaneous, an apparent toning taking place. He asserted that there was no deposit of gold in a combined toning and fixing bath unless there were some free acid present. Sulphur toning, pure and simple, took place, and the addition of gold to such a bath was an utter waste. He had failed to detect any gold in the print passed round. There were many things which, added to hypo baths, produced actions resembling gold toning, but it need hardly be said that it was not necessarily a gold tone because it looked like one. His last advice was that, if people would use combined baths, they should not continue to throw gold down the sink—hypo was cheaper.

Mr. J. E. Hodd brought up a large collection of the newer hand cameras in illustration of the subject before the meeting.

#### MODERN HAND CAMERAS.

No examples of the twin-lens pattern were included, the speaker withholding his patronage therefrom, but the ordinary one-lens camera was represented by a veritable host of English and American workmanship; McKellen's Cathedral camera, changing plates by a peculiar concertina motion; the Adams's Yale, the Monroe, Premo, and Eastman Kodak and Bullet were passed round, and examined with expert attention. Mr. Hodd ventured to assert that never before had the amateur been so well catered for as at this season.

Mr. Freshwater showed Dallmeyer's new hand camera with a very long extension reaching from two to nineteen inches.

Mr. P. Everitt showed a small hybrid hand camera for lantern-slide work. It was composed of parts of well-known instruments, worked at a fixed focal length, a Steinheil orthostigmat being used. There were no finders, the user relying upon the latitude allowed by the quarter-plate in getting his lantern picture, and the proportion of failures in consequence was not more than one or two in the dozen. It was fitted with magazine changing bag, Thornton-Pickard shutter with self-capping blind, and the negatives shown as examples of its work were very creditable indeed.

#### PHOTOGRAPHIC CLUB.

APRIL 12.—Mr. H. Vivian Hyde in the chair.

Mr. Gask, representing Messrs. Beck, Limited, showed his firm's No. 22 Frena camera, quarter-plate size, fitted with single lens. View-finders of the brilliant pattern are provided, but these are such as to give a stationary image, that is to say, an image of one composition, whether looked at from immediately above or to either side. The makers of this camera have introduced a device for making time exposures other than by the button on the camera. It takes the form of an attachment over the lens aperture, with a flap shutter actuated pneumatically. Some difficulty is felt when exposing in the ordinary way in avoiding a jar to the camera, especially when time exposures are concerned; hence this attachment, with which exposures of any duration, down to one-fifth of a second, can be given. Carrying this principle still further, Messrs. Beck also supply a pneumatic attachment, by which the exposing button itself is pressed and the shutter released, for the same purpose of overcoming the jar likely to follow pressure with the finger. It was explained that, with the interleaving cards supplied by the makers, no action is produced upon the film or emulsion, the whole question depending upon the purity of the cardboard employed.

The Chairman showed a few carbon prints produced by Manly's ozotype process. They were his first results, which, doubtless, accounted for the fact that they were not flattering examples of the capabilities of the process, but at the same time they in no way condemned the new method. The pictures chiefly suffered from want of definition, although the original negatives were particularly sharp. One thing noticed, and confirmed by another speaker, was that the support of the carbon tissue was only with difficulty stripped from the transfer paper in the development, unless it were left for very much longer than was required in the original carbon process.

Mr. Philip Everitt showed one of Thorpe's direct-vision spectroscopes, which, instead of being made of three or five prisms, was constructed with a single prism only. It gives a large amount of dispersion in conjunction with a collodion copy of one of Rowland's gratings, the latter being transferred to the surface of the prism itself. The little instrument was sold by Caplatzi for 15s., and was a serviceable and compact piece of apparatus.

**Croydon Camera Club.**—Sir George Newnes, photographer-in-chief—i.e., Mr. Francis T. Beeson—was the attraction provided on Wednesday, 12th inst. His subject,

#### EXPOSURE AND LIGHTING,

was, as may be imagined, when we remember Mr. Beeson is a lecturer on photography at the London Polytechnic, handled with conspicuous ability. Perhaps the most notable point about the lecturer's remarks was made by the exhibition of lantern slides in which photographic prevarication was strikingly illustrated. Thus the first slide showed an ordinary print of a black hat and a white roll of paper; by merely increasing the exposure and altering the lighting, Mr. Beeson rendered the black hat white and the roll of white paper as a black object. So much for truth of tonality. Mr. Beeson's remarks upon lighting in portraiture were specially useful to amateurs, as much of his work is necessarily done under circumstances which most amateurs are accustomed to; that is to say, his portraiture is seldom undertaken in an ordinary photographic studio, but anywhere, and almost everywhere, in the open or in a room. As regards indoor portraiture, Mr. Beeson showed an admirable likeness taken in an office in London, full of both strength and gradation, and not retouched. He then proceeded to explain how the lighting had been arranged in order to get this result. Thus the lower parts of the windows were darkened, a reflector placed to throw light at about right angle to the main source of illumination, and a light screen (butter muslin stretched on a hoop) was interposed between the sitter

and the windows to soften the lighting. Many examples of bad or improper lighting were shown on the screen, the lantern being in charge of Mr. A. E. Isaacs. As regards exposure, a series of results of successively doubling an exposure were shown, and the relative uses and values of various exposure cards and actinometers dwelt upon. The President, in his comments, referred to the unreliable and un-uniform method of speed-marking dry plates in vogue, which rendered an ideally correct exposure most difficult. He asked the lecturer whether, excluding personal impression, any scientific method was known whereby a photographer can, after development, assure himself that an absolutely perfect time of exposure has been given? Mr. Maclean also referred to the still unsatisfactory stop-marking met with in practice. A book just published dealing with modern lenses gives no less than six different systems of diaphragm numbers. Mr. S. H. Wratten fully agreed with the President and the lecturer as regards the unsatisfactory condition of speed-marking. The H. & D. method is probably at present the best, provided that the conditions of development are constant. At the same time it was well to remember that apart from speed variations, due to using different reducers, the above speed-testing apparatus is at times liable to an error of not less than thirty per cent. Mr. Irving read an extract from a book, which asserted that under or over-exposure is indicated by the absence or presence of positive images on front and back of plate. This, however, only refers to pyro developer and to considerable under or over-exposure. In acknowledging the vote of thanks, which was most heartily given, Mr. Beeson said that the unreliability of speed-marking reached its height when a box of plates marked speed 500 was found on exposure to be slow plates, used for photo-mechanical work, with a speed of only ten!

**Hackney Photographic Society.**—April 11, the President (Mr. W. Fenton-Jones) in the chair.—Members were reminded of the Society's excursion to Buckhurst Hill on the 15th, and to Hadley Wood on Thursday, the 20th inst. The last-mentioned was to be the commencement of a series of Thursday afternoon outings which have been arranged for the coming season. Members' work was shown by Messrs. Roope, Hillam, Westcott, and Ellington. Much interest was aroused in the prints Mr. Roope showed, because they were the successful results of some experiments in Mr. Manly's new ozotype process. In the absence of the author, Mr. Rawlings read a paper by Mr. J. Carpenter on

#### STILL-LIFE PHOTOGRAPHY.

In dealing with flower studies, the author said that simplicity of arrangement should be aimed at. Cut flowers should be arranged in a plane and not in a rounded form, because the latter would require the use of a small stop in order to get sharpness all over, and this would prolong exposure too much. Cut flowers drooped rapidly, and it was therefore necessary to shorten exposure as much as possible or signs of movement would be shown on the finished negative. As to choice of material, the commoner flowers were often more satisfactory from a pictorial point of view than the less-known kinds. It would be found that white, cream, pink, and blue-coloured flowers were the best to photograph, reds seldom being rendered well. The author did most of his own work in a lean-to greenhouse with a westerly aspect, the top light being somewhat subdued. The choice of a background was very important; if the pictures were to be in the form of prints, a dark grey background would be suitable; but, if lantern slides were to be made, then a dead black background would be best. For flower and fruit studies isochromatic plates were indispensable. Exposure should be full and development kept well under control, the object being to get thin negatives full of detail. The paper was followed by about sixty lantern slides of Mr. Carpenter's well-known fine flower studies.

**Richmond Camera Club.**—At the meeting on the 10th inst. a competition in lantern-slide making was decided. Two sets of slides had to be made by each competitor, first, a set of three landscape slides from the members' own negatives; and, second, three slides, two from test negatives, and one a copy of the front cover page of *Pearson's Magazine* for February 1899. The President (Mr. Cembrano) was the Judge of the first set, and the members present at the meeting decided the winner of the second set by vote. Nine competitors sent in slides, and the result of the voting on the second set (which was taken first) placed Mr. Gibson as first in the copy of *Pearson's Magazine* cover, Mr. Huddy first in the slide from the thin test negative, *Strand on the Green*, and Mr. Richardson first in the slide from the dense test negative, *Falls of the Lledr*. Mr. Cembrano then proceeded to decide upon the merits of the sets of three slides from members' own negatives, and after they had been passed through the lantern he awarded the first place to Mr. Gibson, who, having also obtained one of the first places in the set of slides from the test negatives, proved to be the best slide-maker and was awarded the bronze medal offered as the prize. The announcement of the result by Mr. Cembrano was received with applause, and the meeting terminated with the exhibition of some interesting slides by Mr. Gibson of natives of India, Ceylon, and the South Sea Islands.

**South London Photographic Society.**—At the Annual Meeting, held at the Club-room, Hanover Hall, April 5, Mr. Charles Oakden, F.R.P.S., presiding, the HON. SECRETARY read his report, showing the Society in a satisfactory position. The PRESIDENT addressed the meeting, and urged the members to exercise originality in their work, deprecating copying, which, he said, could only be justified in beginners, and then to a very small extent. The officers for 1899 were elected as follows:—President: Mr. Charles H. Oakden, F.R.P.S.—Vice-Presidents: Messrs. A. E. Allen, H. Farmer, J. T. French, S. W. Gardner, M. Howell, and W. F. Slater, F.R.P.S.—Committee: Messrs. E. R. Bull, G. Brown, G. F. Dickinson, A. Fellows, W. Howell, W. R. Jarvis, B. Lyon, E. G. Ruckes, and G. J. T. Walford.—Librarian and Curator: Mr. W. C. Boyce.—Lanternist: Mr. A. T. Harris.—Cycling Section: Messrs. H. Esler (Captain) and C. G. Payne (Vice-Captain).—Delegates to R. P. S.: Messrs. Chas. H. Oakden, F.R.P.S., and Frank Goddard.—Hon. Treasurer: Mr. E. A. Whitby.—Hon. Secretary: Mr. F. Goddard, Woodlands, Vanbrugh-hill, Blackheath, S.E.—Hon. Assistant and Excursion Secretary: Mr. S. W. Whiteman.



**Newcastle-on-Tyne and Northern Counties Photographic Association.**—Any illustrated lecture by Mr. J. P. Gibson, of Hexham, is an event of interest to archaeologists, photographers, and to all the artistically inclined. When, however, he leaves Northumberland, the river Tyne, the Roman Wall, and the castles of the Border country to treat of Rome, the occasion appeals to a wide public indeed. Mr. Gibson, about a year ago, visited Rome, and at the last meeting of the Newcastle and Northern Counties Photographic Society, gave what was but a rough rehearsal of a lecture, entitled

#### IN ROME WITH A CAMERA.

Though his stay abroad was a short one, Mr. Gibson contrived to make a very large number of negatives, and in producing lantern slides from these he has been busily engaged for a considerable time. As yet the lecture and the set of slides are in an incomplete state, but Mr. Gibson was able to show about 160 views of the most interesting archaeological and ecclesiastical features of Rome. In describing these the lecturer imparted in his usual homely but none the less erudite fashion an immense amount of information, some of which may have had the effect of disabusing the minds of some of those present of many cherished misconceptions as to Roman history and customs. In concluding, Mr. Gibson urged photographers to travel to Rome, and made it known that it is no longer the malodorous city which it long had the reputation of being. It is, in fact, the second most sanitary capital of Europe, having a lower death-rate than any European capital, with the exception of London. The lecture was given at the Art Gallery, Newcastle, and, though of a semi-private nature, the room was inconveniently crowded by a representative audience, the local art circle being well in evidence.

#### FORTHCOMING EXHIBITION.

1899.  
April 21-May 13 ..... National Trades and Industrial Exhibition, Bingley Hall, Birmingham. Manager, Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.

### News and Notes.

**PHOTOGRAPHIC CLUB.**—April 26. "Defects and Remedies." By Mr. E. Dockree.

Mr. L. UPCOTT GILL, 170 Strand, W.C., will shortly publish a book on *Home Portraiture*, by Mr. P. R. Salmon.

Mr. F. V. A. LLOYD of 5, South John-street, Liverpool, asks us to note that, on and after April 24, his business as photographic dealer and optician will be carried on at 15, Lord-street, Liverpool.

**THE AUSTIN-EDWARDS MONTHLY FILM NEGATIVE COMPETITION.**—The prize camera for the current month has been awarded to Mr. H. S. Sharp, Heathfield, Bingley, Yorkshire, for his negative, *Interior of Room*.

**ROYAL PHOTOGRAPHIC SOCIETY.**—Technical Meeting, Tuesday, April 25, at 12, Hanover-square, at eight p.m. A Demonstration of the Making of Glass Diaphragms, Thin to Newton's "Very Black" Stage. By Thomas Bolas, F.I.C., F.C.S.

THE names of the prize-winners in the Warwick Monthly Competition for April are:—1st prize, 10*l.*, Mr. C. Speight, 10, The Broadway, Kettering, *The Carpenter's Shop*; 2nd prize, 5*l.*, Mr. W. McLean, 20, Ponsonby-avenue, Belfast, *Embroidering Sheets*; twenty prizes, 1*l.* each, Messrs. A. H. Robinson, H. Wanless, W. G. Wright, H. E. Watkin, J. W. Oddie, J. W. Reoch, J. T. Rutherford, R. S. Park, W. H. Oakley, W. Baldwin, A. Morrison, E. Coath, J. Brookfield, J. Terras, Nichol Elliot, J. Coath, Ralph Robinson, Dr. J. W. Ellis, Miss Constance Bean, and Mrs. Dumas.

**MISPLACED KINDNESS.**—At the West London Police Court on the 13th inst., Francis Herbert Barnes, thirty-four, a photographer's assistant, was charged before Mr. Rose with stealing a camera and other photographic appliances belonging to Frederick Sargeant, a photographer, of 372, Uxbridge-road, Shepherd's Bush. The prosecutor, out of compassion, employed the prisoner, hoping by this means to enable him to regain his lost character, he having forfeited it through dishonesty. No sooner was he so employed than he began robbing the man who had befriended him. He stole the articles and pledged them. Detective-sergeant Brown gave an account of the prisoner's antecedents, and the magistrate sentenced him to six months' hard labour.

### Patent News.

THE following applications for Patents were made between April 4 and April 8, 1899:—

**CAMERAS.**—No. 7101. "Improvements in or relating to Photographic Cameras." G. W. BASK.

**CINEMATOGRAPHY.**—No. 7278. "Improvements in or connected with Instruments for Taking and Displaying Rapidly Changing Pictures." H. HOWSE.

**BOXES, &c.**—No. 7360. "Improvements in Metallic Boxes or Cases, Cameras, Shutters, or other Articles." J. E. THORNTON.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### THE SANDELL PLATES.

To the Editors.

GENTLEMEN,—The author of the paragraph in your issue of April 14, on "Photography and Eclipses," seems to be ignorant of working with the Multiple Film Plate. Seeing this, I am surprised he should be so dogmatic. Thus: "Now, it is perfectly evident to any practical photographer that no amount of the 'skilful development' referred to will enable the astronomer on one and the same plate to obtain really useful negatives of the whole area of an illuminated object, the intensity of light radiated from which varies at different positions from 1 to 8000."

Now, Sirs, I know that all practical photographers are not familiar with the possibilities of the Multiple plate, but I know also that many are, and a large percentage of these would not support the above dogmatism, seeing work that has already been accomplished by means of the plates. I can point to work of my own specially, negatives of a brilliant sun, with details in the landscape and dark foreground, the disc of the sun being absolutely sharp and free from halation; and again to a negative of a magnesium flash of five seconds' duration, where full details are shown of the flash, the well-defined Argand spirit flame at the base, and details in the deepest shadow, of black draperies of a figure adjacent, although the only reflectors were dead black walls and ceiling. I do not pretend to measure the differences in intensities of the various portions of the objects photographed, but should imagine they would be not much less, and probably more, than the suggested 8000 of the corona and streamers.

I believe it has been admitted that Mrs. Maunder's negative on the Multiple Triple Plate is the best photographic result yet obtained of a solar eclipse; therefore I fail to see the drift or bearing of your contributor's criticism. It seems to me calculated to harm the progress of, at least, solar photography. Although, Sirs, it may seem that I am an interested party, I feel there is a justification for my troubling you to find space for these lines.

Thanking you in anticipation,—I am, yours, &c.,  
Norwood Junction, London, S.E., April 15, 1899.

J. T. SANDELL.

#### THE NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.

To the Editors.

GENTLEMEN,—Mr. Seamell, in reply to my article upon "Vanishing England" in your last issue, calls attention, as its Hon. Secretary, to the existence of the National Photographic Record Association and its objects. Every one must wish it the highest success; but would not the Association find a heartier, fuller life if, in addition to placing records in the British Museum, it would distribute copies at as low a price as possible to its members? "The trail of the serpent is over us all," and we like to have as much as possible for our money. "Pleasant it is to die for one's country," pleasanter still to live for it, but pleasanterest of all to live for oneself as well as one's country. I have, I trust, the orthodox respect for the British Museum; but, frankly, it is the last place that in an infrequent visit to town as a provincial I would care to visit. The life of the street and the sparkle of the theatre and music-hall are so much more attractive. Still, with the leisure of home and the comfort of my own fireside, I could take a high interest in the prints the Record Association handles. As there must be very many more like myself, would there not be an immense widening of interest were it possible to make this diffusion of result practicable?—I am, yours, &c.,

J. REES.

#### THE TANQUERAY FREE PORTRAITS.

To the Editors.

GENTLEMEN,—You have from time to time kept your readers informed of the "carryings on" of Messrs. Tanqueray of free portrait celebrity. From what a friend of mine who has lately been victimised tells me, it appears the free gift business is still carried on from London, but Paris is where the wires are moved from. My friend was not to be had with the frame dodge; then the picture was offered to him for 8*s.* to cover cost of packing and carriage. This he did not rise to; but, when this 8*s.* was reduced to 4*s.*, he foolishly took the bait. The picture came by rail last week, the railway demanding 6*s.* 6*d.*, charges paid in at London, G.N.R., though the parcel was of no weight, and marked (carriage 4*d.*). My friend has now got, at a cost of 10*s.* 6*d.*, a thing not worth 3*s.* 6*d.*. It seems that any one can take a parcel, say of stones or brickbats, to a



railway company and ask for any amount they like to be paid them, which sum the railway company collect at the other end. By this means Messrs. Tanqueray flourish. If my friend had refused to pay the 6s. 6d., the railway company would have lost that sum, less 4d.—I am, yours, &c.,  
Whitby, Yorks, April 17, 1899. F. M. SUTCLIFFE.

### A SOCIETY FOR PHOTOGRAPHIC PRINTERS.

To the EDITORS.

GENTLEMEN,—There are lessons to be learned in all branches of industry, and some of those branches are terribly slow in learning. I don't think there is a slower-moving industrial branch than photographers. Now, I do not mean to infer that photography does not make rapid strides; perhaps, by comparison with other trades, it is in front, but I mean with reference to self-government. I think, however, I ought to write this under apologies after what has been said, but the idea I wish to ventilate is really of such importance to masters and assistants that one may be forgiven for such a breach.

Comparisons, they say, are odious, but this one savours of success. The building trade is somewhat complicated by its many component parts. We have the carpenter, bricklayer, slater, plumber, &c.; and in photography we have the plate-maker, the operator, retoucher, printer, &c.; but in the building trade we get societies of carpenters, plumbers, bricklayers, &c.; and in photography we get—nothing! I ask, with hundreds of others, Why? Well, Sirs, I don't think the reason is far to seek. Photographers are, no doubt, a jealous lot! This is only natural though, because a printer can be a retoucher, a retoucher can be an operator, an operator can be an enlarger, an enlarger can be an artist—no doubt, many are without knowing it—and an artist can be—"Heaven knows what!" Well, Sirs, how many bricklayers are carpenters, or how many plumbers are bricklayers?

Who is to blame for a non-competent assistant? If I were engaging an operator, I should prefer one who gave all his time and study to posing and lighting, and should not expect him to be competent at half-a-dozen different things and to take entire charge during my absence! No wonder we get faulty men; why, it requires a life of study to be a photographic assistant in our days. Take a materials manufactory, where printing, enlarging, developing, mounting, &c., is included (and there are many). Very often a man is "sacked" if he fails to show himself competent when suddenly moved out of one department to another; and it needs no telling how a man would have to stand out if he could not turn his hand to *variety* in many cases. Now, every assistant stands by and says I must look after myself, I can't afford to join societies, and can't afford to have any restrictions placed on me; I must be free to take what wage I please, and go where and when I please; and as to helping others—pooh! I have enough to do to look after myself.

Having somewhat cleared the ground, I would suggest a society, not for photographers' assistants, but for photographic printers, for instance. We don't want a charitable institute, but a means of centering and ventilating grievances of printers, open to those in situations as printers. Let's have a centre where we can forward letters and book particulars, and where a so-called printer can test his own work against his fellow-printer's, where the trade could make inquiries as to the sort of printer they require, where any correspondence from printers respecting their grievances could be inquired into, and then there will be some hopes of a printer remaining a printer, and being an efficient printer; and then, if operators like to follow suit, so much the better.

Again apologising for this trespass,—I am, yours, &c.,

101A, Fulham Palace-road, Hammersmith, W.

F. G. WILLATT.

### A UNION FORMED.

To the EDITORS.

GENTLEMEN,—The occasional outbreaks of dissatisfaction among assistants which find expressions in your columns would be laughable if they were not annoying. What outsider would dream that these malcontents had an opportunity of joining a Trade Protective Association eight years ago, and simply did it to death by their apathy and cowardice? Who would think that the idea was revived three years ago in another shape; that to-day there is a Union of 3500 members anxious to include the unorganized photographic employees of both sexes and of all ages up to fifty years?

It is, as I have said, both ludicrous and irritating to read one man's promise to "help to form a Union," when he could easily find, on reference to an article in your annual for the current year that such a Union is already in existence.

If any of your correspondents or readers want to save themselves the trouble of ten minutes' search, they can get the details by sending a penny stamp to "Arthur Field, National Amalgamated Union, Maidstone." I think I ought to add another word of dissatisfaction here: Not one in ten of the assistants who favour me with a request for information think it necessary to enclose a stamp for reply. As a rule, those who do so are those who finally join. Nine of every ten neither join nor pay for

information. This is characteristic of the vast majority of the "moaners." They raise themselves to the sacrifice of sending a penny screw to the columns of your long-suffering JOURNAL, complaining of their lot and urging that "something should be done." They mean, something done for them by some one else. As to contributing 6d. to 9d. a week regularly to build up provision against sickness, loss of employment, unjust dismissal, &c., it "isn't in them."

I rejoice to say that an increasing number of far-sighted men and women in the photographic trades are becoming members, but they are still a minority. Nevertheless, the cream of our workers is being gradually organized, and we look forward to the day when competent labour exclusively shall enter into relation with fair employers exclusively.

Age on Entry.	Contribution Payable every Four Weeks.	BENEFIT WHEN OUT OF EMPLOYMENT OR DURING SICKNESS.				PAYMENT AT DEATH TO MEMBERS OF		
		First 4 weeks, per week.	Following 4 weeks, per week.	Next 4 weeks, per week.	Following 12 weeks (per week), in sickness only.	2 years and less than 5 years.	5 years and less than 10 years.	10 years and upwards.
MEN.								
18								
and under 30	2 0 0	15 0	0 10 0	0 7 6	0 5 0	4 0 0	6 0 0	10 0 0
30	3 0 0	1 2 6	0 15 0	0 12 6	0 7 6			
and under 40	2 3 0	0 15 0	0 10 0	0 7 6	0 5 0			
40	3 6 1	2 6	0 15 0	0 12 6	0 7 6			
and under 50	2 8 0	0 15 0	0 10 0	0 7 6	0 5 0			
50	4 0 0	1 2 6	0 15 0	0 12 6	0 7 6			
WOMEN.								
18	1 2 0	0 10 0	0 7 6	0 5 0	0 3 0	3 0 0	4 10 0	6 10 0
and under 50	2 0 0	0 15 0	0 12 6	0 8 0	0 4 6			

Half-benefit only will be allowed to members of six months' standing, and full benefit to members of twelve months' standing and upwards. The period of membership shall date from the first day of the month in which the first monthly contribution has been paid.

Maidstone.

I am, yours, &c.,

ARTHUR FIELD.

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2A, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 2A, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

F. T. Blackburn, 2 Station-road, Budleigh Salterton, Devon.—Photograph of the Budleigh Salterton town band.

B. Bethel, Shire-road, Douglas, Isle of Man.—Photograph of Central and Queen's Promenades, Douglas, Isle of Man.

O. Burton & J. W. Burton, Haymarket, Leicester.—Six photographs of Tom Firr, late huntsman of the Quorn Hunt.

A. T. Osbourne, 100, Hessel-road, Hull.—Photograph of group of the crew of the steam trawler "Richard Simpson," of Hull.

IN OUR NEXT.—Copyright; Black and White; Portrait Lens; and others.

BROMIDE.—The formulae at pp. 1049-51 of our ALMANAC for 1899 will answer the purpose.

G. M. LILFF.—You have quoted the formula correctly. We have had no experience of it.

A. W. ANDRÉE (Colombo).—We are very much obliged to you for your letter, which we will keep by us in case we have an opportunity of utilising the information it contains.

C. B. (Melton, Woodbridge).—From the appearance of the print, we should say you were over-exposing; but give us some details of your method of working, the paper you use, &c., and we may be able to help you.

INTENSIFYING VARNISHED NEGATIVE.—J. CONWAY writes: "I have a negative which I much prize, but it is too thin to print well. Can it be intensified, as it is varnished with a very hard spirit varnish?"—Yes, if the varnish be removed. Soak the negative in strong methylated spirit for a few hours, and then gently rub it with a tuft of cotton-wool. Then rinse with some more spirit, and, if necessary, soak again. In this way the varnish may be got off. Then the negative may be intensified in the usual way; but that must not be attempted until the whole of the varnish is cleaned off, or staining will result.



**RESTORING DAGUERRETYPES.**—C. B. asks us to give him address of a reliable firm who will restore a Daguerreotype for him; he also wants an idea of the cost; size, 5x4.—In reply: We know of nobody who makes a speciality of restoring Daguerreotypes. Will some reader assist C. B. with the information he seeks?

**A. R. RILEY.**—1, 2, and 3. It is against our rules to pass opinions such as you ask for, but you could get what you require for 1*l.* or 1*l.* 10*s.* We should, however, advise you to purchase an instrument by a recognised maker. You will be the more pleased in the long run. 4. F-8, bright light, very rapid plate,  $\frac{1}{15}$  second, should give you a good result.

**COLESWEGEN.**—The uranium process will yield you full density, and negatives so intensified may be regarded as permanent; but the latter condition will not be brought about unless the negative to be intensified has been perfectly fixed and all traces of hypo washed out of the film. The fading of your mercury-intensified negative is caused by the presence of hypo in the films.

**RESIDUES.**—BEGINNER says: "I have carefully saved the fixing solution of eight dozen quarter-plates, and the washings and fixings of about twelve dozen prints. There are nearly two Winchester quarts altogether. What ought I to get for the silver in them from the refiners?"—Probably there is not sufficient silver in the solutions to pay for the carriage to the refiner, to say nothing of the cost of reducing.

**SUBDUING LIGHT IN STUDIOS.**—S. & Co. As the sun is only troublesome in the studio during three or four months in the summer, we should recommend you to stipple over the glass upon which it shines with starch paste, to which a little whiting has been added. That will subdue the sunlight, and it is easily washed off when no longer required. Another plan is to have thin tracing linen or paper stretched on light wooden frames, which can easily be fixed and removed when so desired.

**MARKINGS ON PRINTS.**—E. B. says: "I would be extremely obliged to you if you would explain the cause of the markings on enclosed photographs. I may say that they are only visible after mounting when dry."—The markings are apparently due to the mounts, as the brown colouring matter easily comes off when moistened with water. Probably the mountant on the prints softened it, and thus it stains the pictures. If you moisten the mounts with saliva, and in a few seconds touch with a white handkerchief, you will see the effect.

**GLASS TO STUDIO.**—GLASS says: "I enclose a sample of glass with which I intend glazing roof of studio which I am about to build. The reason I am having it so thick is that I can have it in much longer pieces than ordinary sheet glass, the joints of which so soon look objectionable when they get dirty between the parts that overlap. Do you think the sample sent suitable, and will it stop more light than ordinary sheet glass?"—The glass, will by reason of its thickness, certainly stop out more light than thinner glass of a similar kind; but, as it is very free from colour, there will not be much difference. It will, however, require very substantial sash bars to carry it on account of its weight.

**PRINTING QUERIES.**—R. A. BREMAN says: "Are prints toned by platinum more permanent than those toned by gold? 2. Is there a better or more up-to-date book on platinum toning than that by Lyonel Clark, published in 1897? 3. Can you tell me of any commercial printing-out paper with the surface of the enclosed print? This is Gravura. 4. Can you tell me of any paper, chemically pure, to be suitable for home salting, with this surface? I believe Rives put one on the market some time ago."—1. We have no reason to think so if the prints are toned with gold. 2. No. 3. Most of the commercial printing-out matt papers have a very similar surface. 4. The Rives photographic paper is supplied by Marion & Co. and other large photographic houses.

**MARKINGS ON PRINTS.**—A. T. HONEY says: "I have been troubled lately with a peculiar marking or stain on prints, similar to the print enclosed. My printer assures me he has tried every means to prevent it, but every few days there are more or less pictures spoiled from the same cause. It is not confined to the dark mounts, as similar marks appear on pictures mounted on plate-sunk mounts. The starch used is Glenfield's special photographic starch. Solio and Ilford paper are affected equally. Can you help me! I am perfectly satisfied it is caused by bad manipulation, but cannot find out where. It has not occurred in the few I have toned from time to time as a test lot."—If our correspondent had not said that the markings occurred on prints on other mounts, and that they did not arrive when he himself tones the prints, we should have said they were due to the mounts, as the colouring matter upon them easily comes off when moistened. If our correspondent, who is on the spot, cannot detect where his printer goes wrong, we certainly cannot by merely looking at a couple of stained prints. We can only suggest closer supervision.

**COPYRIGHT.**—COPYRIGHT says: "Might I be allowed to ask your advice on the following matter: About Christmas time I photographed some hounds at a meet on my own responsibility with spectators looking on. A week or so after, a party in the group, a well-known local man, committed suicide, consequently I disposed of about forty copies since, not giving it a thought about making the picture copyright, which I think I was justified in doing. Now, do you think it will be worth my while to do so now, as there will be no doubt fifty copies more wanted? And, if I was to, what about the copies I have issued? Of course, if I was to see one in an illustrated paper or see one copied by some one else, I could not tell if that was one of the first lot I sold before registration, that is what I should feel greatly obliged if you would assist me in; also, if I copyrighted a half-plate print, well, say, and enlarged it, would the enlarged print stand good as the small original as regards copyright, you will do me this favour?"—If you make an enlarged print and work it up, say, in monochrome, and after making it copyright issue copies, you will be protected as regards them. If you make the original also copyright, you will have protection in future. Copies sold—a special private mark might be put on those.

**STUDIO-BUILDING.**—PERPLEXED says: "I am desirous of placing on ground in rear of a detached villa a structure composed of glass and wood supports or a lean-to from back wall of premises, also a glass skylight approach to studio. Should be thankful for information as to the metropolitan law on the subject."—We can only refer you to the Metropolitan Building Acts, which can be had from the Queen's printers, Eyre & Spottiswoode, Great New-street, E.C., but we are not sure that they extend in their entirety to your district. You will, however, have to submit plans to your local authorities and get them approved of before you commence to build. Better consult the district surveyor first.

**VARIOUS.**—"QUANTUM LIBET" says: "1. We find it impossible to use water colours on the P.O.P., and would be pleased if you would kindly say in the JOURNAL the best and where to be obtained? 2. To produce soft lighting on our sitters, which do you consider the best? Some artists use blue lighted studio, others mineral paper, and others frosted glass (our studio has plain glass). Would tinting with a blue paint answer? We have never experimented in this direction, so would like to have a suggestion or two instead of trying what has proved a failure. 3. Where can we learn when the various photographic exhibitions are to be held, and what date work must be sent in by?"—1. There should be no difficulty in colouring P.O.P. prints with water colours. Where is your trouble? The ordinary water colours are used. 2. Either of the methods mentioned answer well, but some prefer one and others another. Some, on the other hand, prefer the plain glass and the judicious use of the blinds. It depends more upon the man than anything else in getting the best results. 3. Forthcoming exhibitions are always duly announced in the JOURNAL.

**PORTRAITURE IN ORDINARY ROOMS.**—CHARLES PARTINGTON says: "I would like to ask your advice about the attic rooms you will notice in the plan below that I wish to make use of for taking portraits, especially busts. I have rapid rectilinear lenses of eight inches and also eleven inches. I would prefer the eleven inch lens for that purpose. Which room is the best for the purpose? I took one in the second room, but there is too much flat shadow, I think. How should I arrange the sitter? How far should the sitter be away from the window, and how far should the reflector be away from the sitter? In taking the bust in the second room, I took the picture from the No. 1 room through the door. In short, kindly advise me as to the best way of getting good portraits in such rooms as these I have at my disposal."—Good portraits, busts, can be taken with the eleven-inch lens with the sitter placed in the No. 2 room and the camera in the No. 1 room. With a little modification in the lighting, the portrait enclosed would have been good. No definite set rule can be given. The best way is to place the sitter at different distances from the windows, and study the effect of the lighting then. When the best effect is obtained, proceed to soften the shadows by arranging the reflector so that there are no harsh shadows. A very little alteration in the arrangement, as we have just said, and the portrait would have been satisfactory.

**AN ASSISTANT'S DIFFICULTY.**—TORQUAY says: "Can you give me a little advice re the following? I was out of a berth, and, in reply to an advertisement in your JOURNAL, I sent photographs of self and wife, references, &c. It was to take management of a branch, to operate and turn out all my own work. Salary, 1*l.* per week, and fifty per cent. on all takings; room, rent, and rates free. I was told rooms were small, but might be made very comfortable. This, of course, was after I had been informed that my specimens, &c., were satisfactory. Well, after arranging for a twelve months' certainty, I agreed to pack up and go. The distance was over 200 miles, and, having furniture, &c., it cost me altogether about 8*l.* Well, on arriving at my destination, I was (my wife more especially) disgusted with the rooms we were expected to occupy, which consisted of two small attics and a kitchen, without a sink or scullery wherewith to carry on the regular household duties of every-day life. Several alterations and additions were suggested, and, when at length we resolved to try it, we were more than horrified to find the place was swarming with bugs and fleas, the former especially. I need hardly say one night was quite sufficient. I acquainted my employer with this state of affairs, and while in my presence he looked at the thing favourably, and seemed agreeable to pay me an additional 7*s.* 6*d.* per week to live off the premises; but, on account of the interruption of some sitters, no final decision was arrived at, and while engaged in operating the governor disappeared, and must have gone on by tram to headquarters. I wrote him asking for something definite, and received a reply to the effect that, as he had no alternative, if I could not live on the premises, would I send in a month's resignation? He felt convinced, after consulting the landlord, that the articles had been contracted from lodgings, removal of furniture, or something of the kind. Now, I know it was not the first, as the lodgings were spotlessly clean, and we had had our furniture removed before without such a thing happening; and, besides, every bit of material was either packed in boxes, wardrobe, or drawers, all fitting very tightly. I know for a fact they are in the walls and crevices. A friend of ours called in before we slept here, and predicted exactly what came to pass. Besides this, we understand that we are not the first who have been taken in with the rooms, but that wise man neither brought his wife nor his furniture, so only had himself to take back. Possibly he lived nearer than I. My employer tells me the landlord (who keeps a jeweller's shop underneath) will hear of nothing other than the operator himself living on the premises, otherwise I could have let the rooms, though, if not fit for me to live in, it is not fit for any one. We are young beginners, and the loss we have sustained to us is very great. Can you advise us what to do? If so, we shall be extremely obliged."—This seems a hard case, but we surmise there is no legal remedy for it. Our correspondent should have seen for himself if the rooms were suitable for him and his wife to live in before he removed into them or accepted the engagement.



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## EX CATHEDRA.

ALTHOUGH the Royal Photographic Society will not for some weeks take possession of its new premises at No. 66, Russell-square, W.C., members no doubt will be interested to know that the building is already practically fit for occupation. We have had an opportunity of viewing the house, which has just been passed out of the decorator's hands, and we do not exaggerate in saying that a more suitable home for the Society could scarcely have been obtained. The large, well-lighted, and lofty rooms of the old mansion are admirably adapted for a meeting room, council chamber, library, offices, and the photographic accommodation it is proposed to provide; and it will be found, we are sure, when the first meeting is held, that the spacious building fulfils in an exceptionally efficient way the requirements of a body such as the Royal Photographic Society, many members of which have for years been looking forward to the time when the Society would have a home of its own. That time has arrived, bringing with it as handsome a fulfilment of the aspiration as could be wished. All that remains to be done is the necessary furnishing, which is occupying attention.

WE are extremely pleased to learn that the action we took a fortnight ago in drawing the attention of members of the Royal Photographic Society to the importance of nominating gentlemen to act as Judges at the next Exhibition has been met by the most encouraging recognition. The nominations that have been sent in number thirty-five for the Pictorial Section and nineteen for the Technical, a total of fifty-four as against five and three last year—in all eight, a number which precluded the necessity for a ballot. This year's balloting paper will be issued, in a few days, with the next number of the Society's *Journal*. It is to be hoped that members will freely exercise their right of ballot, so that the men selected for the office of Judge will feel that they possess something of a mandate. In any case it seems assured that the ridiculous state of things which was brought about by members' apathy or indifference last year will find no repetition this.

\* \* \*

NOT the least remarkable feature about the new studios at No. 51, Baker-street, W., which Mr. Alfred Ellis threw open on Thursday in last week to the inspection of a large and fashionable crowd of people, among whom the "professional" element was very strongly represented, is the rapidity with which the house has been put in order. It is a very few weeks since Mr. Ellis was ousted by the railway company from his former place of business in Upper Baker-street, and in that comparatively short space of time the new house in Baker-street proper has been swept and garnished, redecorated, furnished, and made ready for use. The many guests who attended the popular host's "At Home" last week had the run of the house from basement to roof, and saw not the least of those familiar signs of incompleteness and unpreparedness which are usually very apparent when one is invited to inspect a new installation of any kind that has had to be got ready in a hurry. Mr. Ellis is a man of business to his finger tips, and knows the value of being up to date in all that he undertakes.

\* \* \*

BAKER-STREET has been a great photographic centre these thirty or more years past, and Mr. Ellis's new studios, &c., which occupy the whole of the building, No. 51, constitute a



fine addition to the photographic establishments which already adorn that fashionable thoroughfare. In the basement are large developing and negative-stocking rooms, and a "professional" dressing room, in which the members of an Alhambra ballet might almost be accommodated at one time. Indeed, roominess is a very marked characteristic of the suites of apartments Mr. Ellis has at his command here. The ground floor is occupied by the publication department—a very large branch of Mr. Ellis's business—and thence one finds one's way into a prettily decorated region of lounge-come-reception room at the rear. Gaining the studio upstairs, we perceive that it runs from north to south, catches almost uninterrupted light on both sides, the south, of course, being well under control by means of blinds, &c. The length of the studio is about fifty feet; it is about twenty-two wide, and twenty-three or twenty-four high. Truly a noble place, in which, as the phrase runs, the photographer can do almost anything. The reception room, which adjoins the studio, looks out upon the street. A large part of Mr. Ellis's business lies, as of course every one knows, with stage folk, for whose peculiar requirements every facility is at hand. He has absorbed the business of M. Walery, many of whose negatives are in his possession, prints of them being conspicuously shown.

\* \* \*

We must congratulate Mr. Ellis on the elegance and good taste he has brought to bear in the decoration of his studios, heaviness of furniture and darkness of colour having been avoided. You walk through his spacious rooms with a feeling that your surroundings are light, airy, and graceful. It is a fashion in many quarters to look upon portrait photography as on the decline in the business sense. Evidently Mr. Ellis, to judge him by the bold venture he has just made, is not of this opinion, and he assuredly deserves continued success in his new quarters. It should be said that the walls of his galleries are covered with portraits of famous actors, actresses, and society people, so that one feels one is present among many very old friends when one looks at these excellent specimens. Stageland, in fact, is everywhere in evidence at 61, Baker-street.

\* \* \*

MR. GEORGE W. TOTTEM, F.R.P.S., has recently started in business as a photographic dealer at 6, The Boulevard, Balham, S.W., in the centre of a district thickly populated by photographers, chiefly, of course, amateurs, who have early commenced to show their appreciation of the presence of a photographic dealer in this most easily accessible of the great South-western suburbs. The premises occupied by Mr. Tottem are spacious and elegant, the front shop having a refined and saloon-like character, adorned with a good selection of apparatus and many fine enlargements on Eastman papers. The dark room is a model of neatness and efficiency. Throughout his handsome installation Mr. Tottem shows the possession of a thorough practical acquaintance with photography in most of its branches, a knowledge which is freely placed at the disposal of his clients. It is not every dealer who can point to twenty years' practical experience of photography as a recommendation, or produce first-rate results with the apparatus that he sells; but, in both these respects, Mr. Tottem comes out very strongly, and we therefore wish him the success he deserves in his plucky determination to cater for the needs of the growing numbers of amateur photographers in South-west London.

We frequently have the opportunity of "sitting" for our photograph to professional friends who seek an expression of our opinion on their work. The author of the latest addition to an extensive collection of portraits which owe their origin to this cause is Mr. J. F. Habgood, of The Arcade, Boscombe, at which charming health resort we were fortunate in spending last Easter with a friend. The portrait which Mr. Habgood was kind enough to take of us has been pronounced by those most competent to judge as a striking and characteristic likeness; while, for ourselves, perhaps the most favourable criticism we can pass upon it is that we are very pleased indeed with it. Mr. Habgood has two studios at Boscombe, at which he produces excellent work. He is a clever all-round photographer, and, unlike many of his professional *compères*, has a perfect "studio manner," that is to say, he is quick, certain, and happy in posing and lighting his sitters, whom he easily inspires with confidence. The intelligence and skill Mr. Habgood brings to bear in his photographic work is very great, and should one day win him a place in the front rank of portrait photographers.

\* \* \*

THE many thousands of persons in all parts of the world who follow the yearly progress of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC may be interested in knowing that the volume for 1899 is now out of print, and that our publishers are unable to supply further copies. This result, occurring as it does within about three months of the publication of the volume (the largest in point of size and circulation yet issued), touches record in the history of the ALMANAC, and is a circumstance to which we hope we may point with pardonable pride. It attests, in the most eloquent manner possible, the very high degree of appreciation which is widely felt for THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC.

#### PHOTOGRAPHIC PYROTECHNICS.

WHEN the importance of the subject is considered, it may be held as somewhat singular that the question of actinic lights—pyrotechnics, in fact—has hitherto been treated in such a *dilettante* fashion as this has been. A few experimenters, it is true, have taken it up, most of them for trade purposes, but we are without any serious exposition of the theory of action, and the principles governing the application, of quickly burning compounds as a light source in photographic operations. It is perhaps about thirty years ago when the value of these pyrotechnic mixtures for the purpose was recognised, the outcome being an apparatus for burning them well known at the time, Moule's photogen; burning magnesium wire, and, later, ribbon of the same, displaced the first-used materials, and, coming down to a period comparatively recent, magnesium powder became the popular means of producing actinic light. This, of course, was owing to the so-called instantaneous character of the combustion under the particular circumstances under which it was carried out; hence the term "flash-light." It goes without saying that the cause of this quick popularity lay in the innocuous nature and freedom from smell of the products of combustion. It was not so thoroughly understood as it might have been that the composition of the later kind of pyrotechnic mixtures of "coloured fires," including white, had undergone a radical change. In the older mixture the necessary flame background was formed by the



highly dangerous arsenical compounds, realgar and the like; in the newer mixtures this was replaced by powdered shellac, and, when this, at first secret, method was utilised, coloured fires were profusely used in pantomime and other theatrical effects. But the large volume of smoke, not free from odour, evolved in the combustion rendered them useless in dwelling-houses or in studios unless some elaborate contrivance was devised for carrying off these fumes.

Magnesium powder gave off virtually no smell and the "smoke" passed away fairly quickly, but still there was smoke and enough of it to render even magnesium flashlight virtually impracticable in closed apartments. To simplify the operation of burning the metallic powder and to reduce the smoke, it was used so mixed with various chemicals to supply the necessary oxygen that a return to the older methods was in effect brought about, until an unfortunate spontaneous explosion, with its fatal results, of a quantity of this material brought home to its users its essentially dangerous character. "Chlorate of potash," as also permanganate of the same base, grew in favour, owing to the reduced danger attending their employment, and quite lately the value of nitrate of ammonia has been brought prominently forward. It is stated that, when well dried and finely powdered, it gives, mixed with an equal weight of the metal, a quick combustion and a minimum of smoke. It must be remembered, however, that this salt is deliquescent, and hence care has to be exercised both in powdering and in storing the powder to prevent the absorption of moisture. The composition of the very latest varieties of magnesium mixture was given a few weeks ago in these pages; but, as a recent letter points out, they are patented and, of course, not open to the public generally to manufacture, though the ready-mixed patent compositions are now commercially procurable in convenient packages at reasonable prices.

If it be desired to ask what are the requirements of a powder for photographic light purposes, we may say they are ready combustibility combined with freedom from liability to spontaneous combustion, strongest actinism in the light, and the production of a minimum of fumes or smoke.

The question arises, Is magnesium a necessity in these mixtures, or can it be replaced by any other metal? In reply to such question it may be pointed out that it is now some years ago that aluminium powder was recommended as a substitute and had some vogue at the time of its introduction.

The principle governing the selection of the metal to burn is the production of intense heat together with solid particles of matter suspended, as it were, in the flame to act as light radiators. Intense heat is useless till there are particles of matter to be heated to intense luminosity and so radiate actinic light. A parallel to these points is found in the two types of gas flames now in use. In the old kinds of burner the combustion of the gas caused the deposition of particles of carbon which instantly became, by reason of their heat, luminous; in the newer, the incandescent, the whole of the gas with its contained carbon is burnt with a non-luminous flame; the heat is then conveyed to an ingeniously constructed mantle of network of the rare earths. This becomes so luminous when heated that its brightness far exceeds that of an ordinary gas flame. It has, however, been found that the brilliancy of the light is not purely a function of the temperature, it is dependent also upon the nature of the radiator.

The place where experiment may come in with regard to the composition of an exploding compound is, first, the mode of

obtaining the highest temperature of combustion; and, secondly, selection of the best radiator, whether as an added element of the flash powder or as a product of combustion, and the carrying out of a series of trials of various substances would prove most valuable if done in a systematic manner.

In this connexion it may be noted that a valuable paper bearing on this question was recently contributed to a Continental scientific paper, an electro-chemical journal. In it the writer—M. Goldschmidt—points out the enormously high temperature obtained, reaching to about 3000 C., by the combustion of metallic aluminium in powder under suitable conditions. The object of the experiments in this instance was the obtaining heat rather than light, and he obtained his effect in one instance by igniting a mixture of oxide of iron, sand, and aluminium powder by means of a piece of magnesium ribbon inserted in a pile of the powder and lighted. With the means thus roughly indicated we have the bases of experiments, which, fitly utilised, may be capable of bringing the use of what may be termed pyrotechnic compounds into a practicable and scientific channel.

**Platinotype versus P.O.P.**—At a recent meeting of the Leeds Photographic Society, the Rev. J. Beanland, M.A., gave a lecture on the platinotype process, in the course of which he compared the cost of printing in platinotype with P.O.P. The reverend gentleman said: "There was another erroneous impression he would like to correct. It was said that the paper was more expensive than P.O.P. He had gone into the matter carefully, and found that the cost of printing, toning, and fixing four dozen half-plate P.O.P. prints costs about 5s., and, after making allowances for failures, they might reckon on getting thirty successful prints; with platinotype, the same number, half-plate size, with chemicals, costs 7s. 6d., and the average number of successful prints might be put down at forty-five." Now, this argument (unless the reverend gentleman has been mis-reported) will be not a little amusing from its data. Thirty successful prints from forty-eight sheets of P.O.P.—why not four dozen, with the commercial papers now in the market? Again, with the platinotype process, why not also with the Platinotype Company's paper, a like number of successful prints? Where is the photographer—even the veriest tyro—who does not get more than two dozen and a half good prints out of four dozen pieces of P.O.P.? What would a photographer say to his printers if they had forty per cent. of failures with the prints they made on P.O.P.? If the reverend gentleman had qualified his statement by his own experience of the two processes, one might have appreciated it better. It is noteworthy, however, that Mr. Beanland said, in the early part of his lecture, that, "when he commenced the study of photography on the advice of a professional friend, he started to print with platinotype, and he had stuck to it ever since." Hence it may be assumed he has had but a very limited experience with P.O.P. upon which to found his data with regard to the certainty of its working. It seems, therefore, surprising that he should speak so decidedly on the subject. Possibly, as we have hinted before, the Rev. Mr. Beanland has not been correctly reported.

**An Opportunity.**—Just now photographers have an opportunity of securing photographs of St. Paul's Cathedral such as they have never had before. The block of houses between Paternoster-row and St. Paul's-churchyard has been pulled down, and thus disclose a view of the Cathedral from Cheapside that has never been seen before during the present or the past generation. St. Paul's, like most other cathedrals both at home and abroad, is so surrounded by buildings that it is impossible to see them with advantage, let alone to obtain photographs of them, even when the aid of the widest-angle lenses is invoked; therefore, when an opportunity like this occurs, it should be availed of without delay, as the chance is only temporary, and we know that many pictures have already



been taken. It is true that the ground is not entirely cleared, as part of the corner building still remains, but it is only shop high, and as at present there is no offensive scaffolding up to very seriously mar the foreground, no time should be lost. If the photographs be taken from one or other of the first or second floors on the opposite side of Cheapside, the remains of the demolished buildings will not show very offensively in the pictures. From this point excellent stereoscopic views can be obtained.

WHILE on the subject of St. Paul's we may allude to the discussion that has taken place in the daily press of late, and was prominently brought forward in the House of Lords on Friday last, as to the decorations now going on in the interior under the dome to the order of the Dean and "a Committee of Taste." These coloured stencillings have been described by one writer as being "exactly like the colours of an English lobster salad." Others have characterised the embellishment of Wren's masterpiece with the colours as like an attempt to paint the lily. Whenever anything is done with any of our cathedrals there is generally a great outcry from archaeologists, artists, and others; but repairs are necessary and must be made, even if when, as in the case of the west front of Peterborough Cathedral, a partial rebuilding has to be done. The case is different, however, with "embellishments," particularly when they take the form of Byzantine mosaics in a Renaissance fabric. However, it is satisfactory to learn that the Dean and Committee of Taste have suspended the stencilling work for the time being.

**Vanishing Old London.**—Two more well-known buildings though gruesome ones, are to be pulled down. Newgate Prison and the Old Bailey are to be removed. Neither of them is picturesque, but photographs of them will be exceedingly interesting to future generations, and there is no difficulty in securing them now, and for some little time to come, for we learn that the designs for the new Central Criminal Court, which is to be erected on the site of Newgate, are not yet prepared; still, the latter prison is to be pulled down shortly. Photographic interest is frequently not taken in ancient buildings (though this can scarcely be classed as one, for it was only completed in 1782), till they are in the course of demolition, and they are obscured by hoardings, and "posters," and scaffolding. Newgate, as we have just said, is as yet unobstructed in that way at present, though its removal is close at hand.

**Projected Copyright Act.**—On Tuesday, last week, Lord Monckswell, in the House of Lords, presented a Bill to amend and consolidate the law with regard to literary copyright. At the same time he also presented a Bill to simplify and amend the law relating to artistic copyright, and both the Bills were read a first time. The latter deals, amongst other things, with the copyright in photographs, and, from what we learn, as projected, it is more to the advantage of painters than photographers; the latter, as a body, will do well to watch their interests in the matter. Some artists speak roughly of photography, though they are anxious to sell the copyright in their works to large photographic publishing firms. It would be interesting to learn how many of the works in the Royal Academy Exhibition, which opens next week, have been painted partially, if not wholly, from photographs. Many artists who decry photography utilise it largely to aid them in their work, particularly in portraiture, also in landscapes, though they would be slow to admit it.

**The Metric System.**—Another Bill was brought into the House of Commons last week, and read a first time, to amend the law relating to weights and measures. Sooner or later we shall, doubtless, have the metric system universally adopted in this country; but why should photographers wait, seeing the advantage it gives in compounding photographic formulae, more especially those coming from the Continent? One reason why, as we have heard expressed, is that the metric weights and measures are more costly

than the usual *avoirdupois* and apothecaries' ones. That is really not the case, as there is no difference in the price, with the manufacturers, in the cost of measures by the two systems—graduation for graduation. The price is ruled by the number of the graduations. With regard to the weights, if of Continental manufacture, they are really cheaper wholesale. For example, sets of weights from a centigramme to 300 grammes—roughly ten ounces—are supplied wholesale, in a neatly fitted and polished case, for less than 4s. Why, it may be asked, do not photographic-stock dealers make more of a feature of metric weights and measures?

## JOTTINGS.

THE members of the Royal Photographic Society will not be caught napping this year in regard to the election of Judges for next autumn's Exhibition. There is likely to be an extensive list of nominees, and a more or less keen contest on the ballot. This is quite as it should be. Last year just the required number of Judges was nominated by a total of about as many members, so that there was no election. It would have been all the same if a bootblack had been nominated. It cannot be said that last year's jury gave satisfaction with their awards. Judges seldom, if ever, please all parties, but they usually manage not to fall out among themselves. Last year not only were some of the awards very unsatisfactory, but the people who made them did not hit it one with another. One gentleman who then served writes me that he will not stand again because one of his fellow Judges "bossed the job." There should be no bossing of the job this year if members do their duty, and refuse to elect gentlemen to judge the Exhibition of a Society towards which their sentiments are the reverse of sympathetic.

Mr. Bennetto should pray to be saved from his friends. His process was mentioned in two of the photographic papers last week. Mr. E. J. Wall, who certainly knows what he is writing about when colour photography is his subject, contemptuously dismisses the Bennetto process as "the old, old three-colour process which dates from 1861." On the other hand, a writer in *The Amateur Photographer* says it "is certainly a step in advance and involves a new principle in the arrangement of the camera." For the life of me I fail to see how three-colour photography which relies upon carbon printing with coloured pigments for the finished transparency, can be looked upon as a step in advance. It bears a close resemblance to the backward order of progression. But waiving this by no means immaterial point, let us examine the new principle in the arrangement of the camera—the inclination of a red glass at an angle of 45° to the axis of the lens, and the placing of two other plates with a film between them on the top of the camera.

Berthier, in 1895 (*Manuel de Photochromie Interférentielle*, pp. 52, 53), describes a stereoscopic camera for taking the three negatives at one exposure, and two years later White (*THE BRITISH JOURNAL OF PHOTOGRAPHY*, April 16, 1897) patents a camera for monocular work. Both these cameras allow of the "reduction of the size of the camera to that of an ordinary tourist camera," as claimed for that of the Bennetto, and, as the principle he employs differs only in detail from that adopted by Berthier and White, who take the three images at once, the much-vaunted "step in advance" is, I fear, more imaginary than real. A mere matter of difference in construction, the practical value of which remains to be demonstrated, is not the surest foundation upon which to base the deliberate opinion that the Bennetto colour camera "should open up new paths for amateurs and professionals, and . . . prove the foundation of new commercial enterprise and growth." In the writer's own words this is somewhat "hasty" prophecy, I'm afraid.

One or two other references of this writer also invite correction. It is not, as he says, four or five years since the Bennetto "discovery" was announced. The first reference appeared in this *JOURNAL* for July 31, 1896, not three years ago. Again, "the



official and reliable information" about the process was not, as the writer appears to think, published for the first time last week; it all appears in this JOURNAL for December 2 last, nearly five months ago. Then the writer goes on to say, "There is nothing absurd, unscientific, or impossible, in Mr. Bennetto's device, as has been suggested, and, in holding over our comments until official and reliable information became accessible, we had in mind those hasty criticisms in other quarters which may have damaged the commercial reputation and development of the process, to say nothing of the risk which hasty critics run of being brought unpleasantly to book."

Now, I have read all the criticisms that have been delivered on the process, but I do not remember to have seen it described as "impossible." It is certainly "absurd" if it is put forward as a novelty, for three-colour negative-taking and carbon printing in colours were not discovered at Newquay. As to the process, taking it by its inventor's description, being wrongly termed "unscientific," when the writer I am quoting from drops such highly illuminating terms as "red" glass and "greenish-yellow" films, he will inspire some confidence in his ability to defend the Bennetto process as the philosophical outcome of a study of the Young-Helmholtz colour-vision theory, and the Clerk-Maxwell theory of colour sensation, which are the essential roots and foundations of all "scientific" three-colour work. The writer's benevolent solicitude for the commercial development of the process, coupled with his denunciation of hasty criticisms, is funny—very funny.

If the Bennetto three-colour camera and carbon process were entirely new, they might merit the eulogy passed upon them. But they are only new in unessential details—and there's the rub. Of course, you can make very pretty transparencies by superposing coloured pigments in gelatine; indeed, I'm told Mr. Ives worked such a process years ago, only to abandon it. Mr. Ives is a sound, conscientious, and scientific experimentalist, who has abandoned many a process which did not answer the requirements of colour theory. The Bennetto process is certainly colour photography of a kind, but it is not photography in natural colours, or in the colours of nature, such as men like Lord Rayleigh, Captain Abney, Professor Joly, Professor Lippmann, Wiener, Zenker, and the other great theorists would define it. Not by any means for the first time do I say that, so far, Mr. Bennetto has done nothing whatever to satisfy us that he is really in possession of that "jewel" of colour photography he has more than once referred to. And, the mysterious jewel apart, bichromate printing in three colours does not entitle Mr. Bennetto to claim, as he did last January, that he has "solved the problem of colour photography." Not yet, Mr. Bennetto; not yet, if you please!

To "Touchstone": The Salon epitaph is still in MS. But I am tempted to put it in type, for, after a recent whip-round of thirty shillings a head, which the noble Links had to impose upon themselves to make up a deficit, matters Salonic must be getting in a bad way. The next thing we may hear of is the Ring going, hat in hand, to the Photographers' Benevolent Association for a "sub." The P. B. A. has 300*l.* in hand which it does not know what to do with. I shall be pleased to support the Ring's application for assistance; and, to the same end, I will, if desired, raffle the MS. of that epitaph amongst members of affiliated societies at a shilling a head! Meanwhile, my dear Touchstone, you will be glad to know that the R. P. S. is moving into a New Palace of Delight in Russell-square. It is quite a baronial mansion, with a ceiling by Angelica Kaufmann, and other attractions. And all this and more may be had for the inadequate sum of one guinea per annum!

It is refreshing to turn from the untenable claims of *soi-disant* discoverers of photography in natural colours to the extremely interesting paper on the real subject by Professor Wood, of Wisconsin University, which was published in these pages on

April 14. By the beautiful device of superposing a photograph of a diffraction-grating on a glass positive, Professor Wood secures a transparency which reveals natural colours by transmitted light. No more elegant and simple method of obtaining results in colour has yet been published, and it is to be hoped that Professor Wood's work will be taken up and repeated by others. In the way of easily multiplying copies, it seems to have possibilities not possessed by any other method. While on the subject of colour, I should like to draw attention to the fact that the *Optician* is publishing a translation of Wiener's paper on "Colour Photography by Means of Body Colours and Mechanical Colour Adaptation in Nature," a deeply interesting contribution to the philosophy of colour photography which the student should possess.

Specimen thieves, whose wicked ways have recently formed the topic of many complaining communications to this JOURNAL, should make a note of a case mentioned in *Ex Cathedra* for February 17 last (p. 98). A firm was sued for the wrongful detention of specimens, and the plaintiff obtained damages to the pleasant little tune of 75*l.* Operators are frequently very foolish in unnecessarily parting with specimens, or sending them so carelessly packed that there is no possibility of returning them; but cases of real and deliberate detention do occur, so that, where all the facts are known, the precedent I have just quoted may be very effectively played off against an offending party.

COSMOS.

#### FOREIGN NEWS AND NOTES.

**Fat in Gelatine**—Dr. E. Vogel refers to this question in the *Photographische Mittheilungen*, and recommends the use of ammonia to obviate the difficulties brought about by the presence of grease. The collotyper, to his regret, is familiar with the small pits due to greasiness of the gelatine. These produce black spots in printing. It has been recommended to keep the gelatine some time in a fluid state to allow the fatty particles to rise to the surface, and then to draw off the gelatine from below. This is a doubtful remedy, as it only removes the coarser fatty particles, whilst the finer remain distributed like an emulsion in the gelatine. The best means by which the fat may be removed is to treat the gelatine with ammonia, which converts the grease to soap. The gelatine should be dissolved, two per cent. of ammonia added, and the vessel should then be stood for ten minutes in boiling water and frequently stirred. To prevent rapid evaporation of the ammonia, cover the vessel with a sheet of glass, allow the solution to cool down to 50° C., and then add the bichromate. As the gelatine is softened by the addition of ammonia, it is preferable to start with a harder gelatine. Chrome alum should not be added, as it would be decomposed by the ammonia. Gelatino-bromide plates prepared with ammonia show less tendency to pit than those made by the boiling processes, for the reason above stated. In the boiling processes the gelatine might be treated with ammonia to remove the grease, and then neutralised, or rendered slightly acid, with nitric or glacial acetic acid.

**Transferring Process Negatives.**—The *Photographische Chronik*, in replying to an inquiry, discusses the question, Why process negatives tear and strip more readily than line negatives. The tearing may depend upon the larger number of acid and alkaline baths which are used in process work, and, combined with copious washing, they may loosen the film. But the principal factor is the deterioration of the elasticity and flexibility of the film by the more copious and compact deposit of metal in the process of intensification as compared with line negatives. This is very evident if a line negative, intensified with pyro and silver, is compared with a process negative intensified with lead or bromide of copper. A good collodion will stand much, but many collodions used for process work are far more porous than those used for line work. Tearing of the film in stripping is best avoided by adding acetic acid to the bath, and using a thin, flexible paper, which has not been over-sized, as temporary support. But, when the transfer has been successfully accomplished, how is it that process negatives strip from the glass support more readily than line negatives? This is due to the heavier deposit of metal in the process of intensification. It often imparts a perceptible relief to the image. The film is then coated with rubber solution and plain collodion, but no fusion with the collodion of the negative occurs. After the negative has been reversed it only



adheres to the glass by the dots formed by the screen, whilst in the case of the line negative considerable areas adhere. This is proved by the fact that only the high lights, in the process negative, detach themselves from the glass.

**Parallelism in Copying.**—Herr Gerstenbrandt, of Gratz, recommends the following method: Set up the camera in front of the plan, or map, to be copied, and adjust it with a spirit level. Fix a compass to a square block of wood, bring one of the edges in contact with the object to be copied, and note the exact position of the compass. Then apply the same edge of the block to the focussing screen, and turn the camera on the screw, so that the needle of the compass assumes the same position as before.

**Bismarck's Photograph.**—The photographers, Wilcke and Priester, who photographed the late Prince Bismarck, have been sentenced to imprisonment for six and three months each, respectively, for illegally entering the room in which the body of the late Prince lay. The keeper, Spörcke, who assisted them to enter by the window, has also been condemned to five months' imprisonment. We do not think any sympathy will be felt for the perpetrators of this outrage on the feelings of the relatives of the deceased statesman.

**Peroxide of Hydrogen and Photographic Reliefs.**—The *Photographisches Wochenblatt* draws attention to a paper read by Dr. Andresen before one of the Berlin photographic societies. One volume of peroxide, in concentrated aqueous solution, evolves, when boiled, 475 volumes of oxygen. It is therefore an oxidiser. But, in consequence of the peculiar condition in which half of the oxygen exists in combination with oxygen in the opposite condition, it may also be used as a reducer. For instance, peroxide of hydrogen reduces silver oxide to silver by affinity of the oxygen of the silver oxide for the excess of oxygen in the peroxide of hydrogen. But,

since diamine,  $\begin{array}{c} \text{NH}_2 \\ | \\ \text{NH}_2 \end{array}$ , and hydroxylamine,  $\begin{array}{c} \text{NH}_2 \\ | \\ \text{OH} \end{array}$ , are developers, it also seems

probable that peroxide of hydrogen  $\begin{array}{c} \text{OH} \\ | \\ \text{OH} \end{array}$  is also a developer. This

is actually the case if the peroxide of hydrogen is used in alkaline solution, by which means the silver bromide is predisposed to form silver oxide. Peroxide of hydrogen acts differently in acid solution. In this case the metallic silver is converted to silver oxide, and is dissolved by the acid. It therefore becomes a reducer. But it also dissolves the gelatine that incases the particles of silver, and a negative relief of transparent gelatine is thus obtained, in which the highest lights form the deepest depressions. This may be important in photo-mechanical work, and a patent has been applied for.

**The Action of Light at Low Temperatures.**—Messrs. Lumière gave an account in the *Bulletin de la Société Française* of some experiments made for the purpose of ascertaining if the action of light on the silver haloids is physical or chemical. As it is generally admitted that chemical action is slower at low temperatures, a gelatino-bromide plate was plunged in liquid air. Part of it was allowed to emerge, and was exposed to light. It was found that short exposures did not produce any appreciable effect. The portion of the plate immersed in liquid air was reduced in temperature to  $-191^\circ \text{C}$ . Light action could be obtained by long exposure, and extra-rapid plates were found to require 50 to 400 times normal exposure at  $-191^\circ \text{C}$ . Light action was further reduced at the surface of the liquid where evaporation produced a still lower temperature. It was also observed that the same phenomena were produced when the plate was not in actual contact with liquid air, and that the latter absorbed chemical rays but very slightly. The plates did not suffer deterioration by exposure to liquid air, and regained their sensitiveness at the ordinary temperature. It was found that the latent image could be exposed to  $-190^\circ \text{C}$ . without impairing capacity for development when the normal temperature was restored. Refrigeration was, therefore, the sole cause of the want of sensitiveness, which tends to prove that the latent image is the result of chemical decomposition. Other light-sensitive materials, such as citrate of silver paper, bichromated mucilages, &c., also remained unaffected by light at about  $-200^\circ$ . Although chemical action is no longer manifested under these conditions, it is not the case with all phenomena produced by light, such as phosphorescence. Sealed tubes of barium, strontium, calcium, and zinc sulphate were heated until

every trace of residual phosphorescence was removed. These tubes were plunged in liquid air in the dark, and, when reduced to a temperature of  $-191^\circ \text{C}$ ., they were exposed to sunlight, electric light, and X rays. Upon withdrawing the tubes in the dark, they became luminous as the temperature rose. It may therefore be concluded that light is active and is stored up at  $-191^\circ \text{C}$ ., but its manifestation is suspended until sufficient heat is restored.

#### THE FUNDAMENTAL PRINCIPLES OF PHOTOCHROMY.

IN a paper on "The Application of the Diffraction-grating to Photochromy,"\* I have briefly sketched the fundamental principles of heliochromy upon which a proper classification depends. I shall now enter more fully into the matter.

The word "indirect" applied to a photochromatic process is obviously very vague, and leads to confusion between such optical processes as those of Ives and Joly, and chemical processes such as one of Graby's methods referred to in the former paper. The real distinction between the two principles, that one depends on the accepted theory of colour vision while the other does not, does not convey a precise notion to any one who is not tolerably well acquainted with the subject of colour vision and the origin and development of photochromatic methods.†

It is, perhaps, natural for such a person to attempt to discriminate between the two fundamental methods by noticing that the known composite processes depend upon colour screens for their effect, while the direct processes do not. It is, however, conceivable that a direct process—one that does not depend upon any particular theory of colour vision—should make use of screens to produce the effect of colour.

If a slit be illuminated and photographed by a model "prismatic camera," the image on the sensitive plate would consist of one or more bands according as the slit was illuminated with monochromatic light or not; in fact, the same kind of effect would be obtained as that shown on the corona photographs obtained by Sir Norman Lockyer with his prismatic camera. It is easy to imagine that a positive from this banded negative, when backed with a screen coloured and graduated like a spectrum and viewed through the prism, could be so illuminated that the colours should be recombined and the eye should see the slit in its natural colour. Of course, it is extremely doubtful whether such a process could be of any practical use, as obviously the object must be very narrow.

In my former paper Captain Abney was mentioned as dividing processes into "indirect" and "direct." I find, however, that he apparently prefers the divisions "colour photography" and "photography in natural colours," respectively.‡

"It may be said that any feasible theory of colour vision lends itself to the success of colour photography, whilst it requires no theory to take a photograph in natural colours."

The distinction between "colour photography" and "photography in natural colours" as terms is somewhat subtle, but Abney's definition undoubtedly distinguishes what are, perhaps, most correctly called the "composite" and "direct" processes in their fundamental points; but:

"Evidently these (Lippmann's) photographs do not fall under my definition of what is photography in natural colours."

"Photography in natural colours, according to my definition, is photography in pigments."

Abney here makes a restriction which is not even implicitly contained in his first definition; but, accepting both definition and restriction, Lippmann's process, although it is a direct way of producing photographs in natural colours, is not "photography in natural colours." This would be a contradiction of terms if "photography in natural colours" were not simply a name of a class of process to which Lippmann's method does not, according to Captain Abney, belong. Obviously almost any other word would have answered this purpose, and would have been less misleading.

The classification, then, according to Abney, in terms which, I think, are less misleading, is as follows:—

1. Composite processes (which depend on some theory of colour vision).
2. Direct pigment processes (colours due to absorption).

\* THE BRITISH JOURNAL OF PHOTOGRAPHY, April 14, p. 232.

† En passant, it may be remarked that this shows the hopelessness of attempting to expose the subject of heliochromy in the way that is unfortunately almost always done in the case of other sciences (mathematics, notwithstanding the fact that its development is very like that of a physical science, has been the worst treated in this respect), that is, starting from "definitions."

‡ See for example, Abney "The Scientific Requirements of Colour Photography," being the sixth Robert Boyle Lecture delivered before the Oxford University Junior Scientific Club, on June 1, 1897.—*Journal of the Chemical Society*, June 1897, 23 pages. (Henry Frowde). The quotations are from pages 1, 22, and 21.



3. Direct processes of which the colours are due to other causes, such as interference.

The notable point in Abney's classification is the separation of 2 from 3. Bequerel's results were certainly due partly to interference, and that any direct pigment process does not depend on "position of particles" as influenced by wave-length, apart from other properties of light of different colours, is *a priori* so extremely improbable that such a view cannot be accepted without the very strongest evidence. The evidence is at present by no means very strong, and wholly experimental; there has been no serious attempt to raise it to the theoretical state; in other words, to give a rational explanation of it. On the other hand, the Lippmann, or rather the Zenker-Rayleigh, theory affords a theory which is easily conceivable and is capable of mathematical treatment.

PHILIP E. BERTRAND JOURDAIN.

#### NEW MODE OF CHLORO-PLATINITE OF POTASSIUM MANUFACTURE.

The *Chemical News* has an extract in full from the Bulletin of the French Chemical Society of a paper by M. Vèzes upon the production of this salt, so important in the platinotype process. M. Vèzes' process is considered by the author to be much superior to methods hitherto employed. Chloro-platinate, made in the usual manner, is suspended in a quantity of water insufficient to dissolve it even when warm (1 litre per 100 grammes of chloro-platinate, for example; there would be no inconvenience in even reducing this quantity of water). We add one molecule of neutral oxalate of potassium for each molecule of the salt (say, 37 grammes of crystallised oxalate  $\text{CO}_2\text{K}_2\text{CO}_3\text{K} + \text{H}_2\text{O}$  per 100 grammes of chloro-platinate), and heat to boiling. The oxalate dissolves and reacts on the dissolved part of the chloro-platinate; it gives off carbonic acid gas, and the solution, at first a deep yellow, becomes red. The chloro-platinate then gradually dissolves, passing to the state of chloro-platinite, and finally, after the lapse of several hours, the whole is dissolved; the deep red liquid, on cooling, deposits perfectly pure crystals of chloro-platinite. The weight of the crystals thus obtained by the single operation naturally depends on the more or less concentrated condition of the liquid during ebullition; with a convenient concentration it may be more than eighty per cent. of the theoretical weight of the chloro-platinate employed. By the addition of alcohol to the mother liquor it is easy to precipitate almost the whole of the remainder of the salt. To sum up, the preparation of chloro-platinite of potassium may be easily effected by the direct reduction of the platinite salt, held in suspension by boiling water, by means of an equivalent quantity of neutral oxalate of potassium.

#### SOLUTIONS OF ALKALINE CHROMATES.

Now that the carbon process is coming so very prominently forward in connexion with ozotype, Mariotype, and other more or less "up-to-date" methods, it may not perhaps be amiss to call attention to a circumstance that is to a very large extent overlooked by occasional workers whom it most materially affects, if not perhaps also by those who are more regularly engaged in its working. We allude to the fact that solutions of the alkaline chromates, more particularly the bichromates in the pure state, *i.e.*, in the absence of organic matter, are practically, if not absolutely, insensitive to light, whereas the presence of a comparatively minute proportion of any of the usual organic constituents of paper or tissue renders them not only slowly sensitive to light, but also liable to spontaneous reduction in the dark. This means in the first place, of course, that whereas a sensitising solution that is fresh will keep indefinitely, after it has once been used, it begins to deteriorate rapidly, losing the bright, clear, orange tint, and gradually acquiring the smoky brown shade that tells of decomposition; hence, in the first place, a solution once used should never be poured back or mixed with fresh "stock."

It is not only that this partly deteriorated solution is robbed of some of its latent energy, but it actually acquires new properties not dissimilar from those of old sensitised tissue as compared with fresh. The same changes that occur in the tissue itself go on in the same manner, but perhaps more rapidly, in the solution, and, if the latter be of the semi-discoloured description, its effects in sensitising will be tantamount to the production "right off the reel" of a tissue three or four days old. This fact has long been known and utilised for the purpose of obtaining soft prints without the trouble of waiting for the tissue to mature, and many special additions, such as soap, sugar, glycerine, alcohol, and other

substances have been recommended to be made to the sensitising solution with that object in view. But, though the fact may be utilised for practical purposes, it is just as well to keep it clearly in mind, otherwise its possible advantages may be secured when they take anything but a beneficial form.

The different substances exercise widely different effects, though more in degree than in character. A soft gelatine will dissolve more freely in the sensitising solution in warm weather than a hard, and may naturally therefore be expected to lead to more rapid decomposition. Glycerine, sugar, and soap, all familiar constituents of "tissue" as met with in commerce, all have their individual action, while a very small proportion of alcohol will, in a short time—sometimes only a few minutes—completely rob the solution of all sensitising action by the entire reduction of the chromic salt. Bearing these facts in view, the old plan of sensitising and resensitising in the same bath would seem to be the very worst possible to adopt, and nothing short of freely brushing or sponging on to the tissue itself and removal of the surplus by squeezing would appear to offer satisfactory results.

#### COMBINED TONING AND FIXING.

At the London and Provincial Photographic Association, on April 20, the question of Mr. E. Banks' criticisms of Professor Burton's recently published formula for combined toning and fixing again came up, some idea having taken root that the same was a reflection upon the permanence of the combined gold bath and upon gold toning.

Mr. Banks made it clear, however, that this was not his intention. The matter of permanence was a relative question, and he would certainly not assert for a moment that any form of silver print was permanent. His advice amounted to this, that, seeing that gold was wasted in a combined bath, it would be more economical to omit it altogether. Hypo, in the presence of lead and many other substances, would tone the print to any colour desired, with no diminution in permanence, compared with gold-toned prints.

Mr. R. P. Drage avowed a sympathetic regard for the combined bath. He had used it as far back as the time of the introduction of Aristotype paper, and had prints toned in such manner by formulae not materially different from those of the present time, which did not, by signs of deterioration, encourage him to regard doubtfully the value of the combined bath. He was also loth to look upon gold, the photographer's old friend, as an unnecessary substance in toning operations.

The Chairman instanced prints on Alpha paper, and said that he did not find that hypo would tone them alone. The addition of gold, however, at once set up a toning action. He had prints of this sort, nine years old, but no change had occurred in them.

Mr. W. Thomas believed that a large share of the trouble which arose with prints made by the combined bath was to be traced to the fact that the prints were often imperfectly fixed. As soon as the toning was apparently done the print was removed from the bath, when perhaps it was far from fixed. He instanced the case of a picture which was required in a hurry for illustrative purposes and had to be printed off without loss of time. This was done, the print stuck in a combined bath until fairly well fixed, washed for half a minute under the tap, dried, and mounted. Contrary, however, to what he imagined would be the fact, this print, when seen some time after, was better than many which had had the maximum of attention devoted to them.

The Chairman agreed, saying that the same applied to plates as well as papers, and speaking of imperfect fixing as one of the greatest evils to be contended against.

Mr. Thomas showed a couple of negatives afflicted in a peculiar manner. He was using a hand camera blessed with a shutter working far too quickly, and this, combined with the further fact that he was exposing on a very dull day, resulted in some plates which he knew were much under-exposed. He took rodinal (one in sixty) and left the two plates shown standing upright in a tank for ten hours (all night). In the morning he found them affected with an appreciable silver deposit and reversal in the shadows.

The Chairman recommended friction with turpentine or spirit as sure to remove the deposit. It was something like what occurred with a developing solution in an over-alkaline condition.

Mr. Thomas said it was interesting to observe that, despite the long time of development, there was no sign of granularity, or of uneven action or stain.

Mr. Lewis Madland showed some slides of Stockholm, visited in 1885, and gave a few interesting particulars of his stay in the Swedish capital, which somewhat resembles Venice in its position on many islands, being indeed called the Venice of the North.

Mr. Freshwater showed a Lumière colour transparency, made on the multiple-stained-film principle. Some jewels in one of the pictures were wonderfully well rendered and attracted special attention.

Mr. H. O. Rapson contributed some early slides of Gloucester Cathedral, St. Paul's, the Houses of Parliament, and other places, and, with the other exhibitors, was accorded a hearty vote of thanks.

\* See this JOURNAL, p. 232.



## PHOTOGRAPHY AND THE FUTURE OF ILLUSTRATED JOURNALISM.

COMMENTING upon an article by Mr. C. K. Shorter on Illustrated Journalism, which appears in the April *Contemporary*, the *Pall Mall Gazette*, asks: "What is to be the future of illustrated journalism in England? Is Mr. Clement Shorter wise in predicting that the earlier years of next century will see an illustrated *Times*? Is it true that the future of the black-and-white artist who devotes himself to the 'news block' is 'absolutely assured'?" These questions are of greater moment to the art student to-day than possibly the public imagines.

"Judging him strictly on his record," proceeds our contemporary, "Mr. Shorter has been himself—perhaps of necessity—an upholder of the photograph as against the artist in illustrated journalism. He does not believe that there is any 'overwhelming popularity attached to the pen-and-ink drawing, however intrinsically artistic.' He has more than a lurking sympathy for the 'accomplished journalist,' who prefers a photograph of a house to the most finished drawing by an artist of repute, though why he should confine himself to 'a house,' and not include also a horse, or a dog, or a man, will pass the comprehension of most people who have given a moment's study to the point. It is clear, therefore, that, if the future is to see a conflict between art and photography, Mr. Shorter, who is responsible for the art conduct of one of the great illustrated papers, is prepared to range himself on the side of photography.

"The question, then, for the journalistic artist to consider is, How far can the camera supplant him, and where exactly lies the dividing line between the things which the camera can, and cannot, do for the illustrated paper. Were the point decided on artistic grounds alone, the camera would be ruled out of court, for photography never was art and never will be art—is, indeed, getting further away from the artistic basis with every new 'fake' that is invented. But the public loves the snapshot and never questions its accuracy. Many people who are comparatively sane on other subjects have been known to prefer it to the work of the artist. It is, therefore, useless, from a business point of view, to fight the camera on its own ground. Fortunately, that ground is more restricted than Mr. Shorter seems to imagine. The photographs of the late Spanish-American War and of the operations in the Soudan, for example, have proved conclusively that the camera is no good at all on the field of battle. It minimises the enemy, which is a fatal error unknown to the old artist-correspondent, who never failed to cumber the foreground with the bodies of the foe! But, worst of all, it absolutely ignores personal valour, or depicts it in so tame a light that the spectator is left stone cold. In the matter of general news it is no better. Photographs of the late fire at the Windsor Hotel, New York, show us an empty street with a puff of smoke on the house-tops, and one or two firemen standing placidly on a ladder, for all the world as though they were being photographed. For action of any kind the camera is impossible, not alone because it lies, but also because it can never be used at the critical moment. It is only in the presentation of inanimate things that it can be of solid use, and, alas! its inanimation already rests heavily upon the English illustrated newspapers. In the old time one found the news of the day transfigured by the bright intelligence of the artist, quick to seize the essentials only; to-day one finds the pages black with unintelligent photographs, each a mere accumulation of irrelevant and dead-alive details, hopelessly out of proportion to the facts which they would chronicle. Let the photograph be kept in its place as the recorder of interiors—even of buildings; let it by all means give us pretty faces, largely doctored by the man behind the screen; and let it, if it will, depict for us all the other things which do not depend upon living impulses or accuracy of detail. But beyond these limits the artist will remain supreme, and the public will learn to respect him and call for him more and more as art knowledge spreads, and as the appreciation of art becomes a real influence and not merely a fashion, as it is at the moment."

## AN "IMPROVED" GELATINE EMULSION.

HERE MAX PETZOLD, of Chemnitz, proposes the addition to gelatine emulsions of developing substances, so that after the exposure of the plate all that is necessary to produce the image is the application of an alkaline solution. We give Herr Petzold's ideas in his own words, but we have little or no faith in their practicability:—

"If reducing substances be added to a bromide or chloride of silver emulsion ready for running or coating, the emulsion is decomposed on drying, in consequence of the energetic tendency to oxidation of the developing substance.

"In order to avoid this, the simultaneous addition of sulphite of soda is proposed, but this is a failure owing to its also being exposed under certain circumstances to very energetic oxidation, that is to say, it is very easily decomposed, because sulphite of soda in and of itself has an alkaline reaction whilst the reduction chemicals are only oxidised in this (alkaline) solution. If this easy oxidation of sulphite of soda could be avoided, the oxidation of the developing substance in the emulsion could also be avoided. This is easily attained if, in place of sulphite of soda, bisulphite be employed, which is only slightly constant and decomposes into sulphite and sulphurous acid. The sulphurous acid thereby released prevents in

*statu nascendi* the oxidation of the resultant sulphite and also of the developing substance, whilst, on the other hand, the silver salt is guarded against reduction in the emulsion. These appearances are also assisted by the acid reaction.

"The same result is attained with the use of acids in the presence of or without sulphite of soda instead of bisulphite. The sulphite of soda is then converted into a soda salt of the actual acid employed, whilst sulphurous acid is released.

"The process which forms the object of the present invention allows of sensitive dry plates and papers being produced, the emulsions of which contain developing substances and for the development of which only alkaline solutions are necessary.

"The following is an example of one means of carrying out this invention. 300 grammes of developing substance, such for instance as hydroquinone, pyrogallol acid, eikonogen, para-amidophenol, glycin, metol, or other suitable reducing substances employed for photography, are added to 10 litres of emulsion ready for use, the said reducing substance being in turn treated up to twenty per cent. of its weight with an acid sulphite or with sulphite of soda and organic acids which are thoroughly well stirred, poured out and allowed to dry."

## THE MAKING OF MIRRORS.

MIRRORS were formerly produced only by covering one side of the glass sheet with a coat of tin amalgam. Such mirrors are still being manufactured, the coating mixture consisting of from 20 to 25 per cent. of mercury. The old process, however, is now being largely replaced by silvering. The mercury process is highly injurious to the health of the operatives, as the working rooms quickly fill up with poisonous vapours. The silvering method, therefore, has become a blessing to the mirror-makers. It is true that silver mirrors, owing to the thinness of the metallic coat, are not as lasting as the old mercury mirrors, and their sensitiveness to air containing hydrogen sulphide is also somewhat awkward, but for protection from the latter the metal coat is covered with varnish, and, besides, they can be produced cheaper than mercury mirrors, and there is a smaller loss of light. The loss of light with mercury mirrors amounts to 33 per cent., while with silvered mirrors a loss of only 7 per cent. is suffered. For the better qualities of silvered mirrors, glass as colourless as possible, either plate or blown, but well levelled, is used. The light is reflected from the metal surface, that is, from the reverse side of the glass. Should the silver shade slightly into yellow, this shade can be neutralised by using slightly bluish glass.

Silvering and gilding of glass is based on the reduction of the dissolved metals by organic substance. The reduction of a silver-bearing solution by the action of an organic substance can be demonstrated on a small scale if a solution of nitrate of silver in distilled water is heated to boiling and mixed with a solution consisting of one part of grape sugar and eight parts of distilled water. The mixture instantly becomes dim, and in a short time the silver is precipitated in the form of a fine powder on the bottom of the vessel, which, if of glass, is covered with a yellowish-white coat of metallic lustre. The beauty of the metallic covering depends upon the careful preparation of the solutions. In a general way a solution of nitrate of silver containing an alkaline reducing agent is poured on the glass sheets, which, after standing in the cold for a short time, is covered with a firmly adhering coat of silver. As reducing agents there are used pure grape, starch, or milk sugar, and caustic soda or potash, sometimes tartaric acid and ammonia. By pouring the solution on the glass, however, air is often entrained, causing blemishes in the coat. To obviate this, the following process is recommended by *Neueste Erfindungen und Erfahrungen*: The sheet of glass to be silvered is placed in a box made of glass or porcelain, and somewhat larger than the glass sheet, the opposite edges of the sheet resting on two cross bars of glass or porcelain. The side of the sheet that is to be silvered is turned downward. Then the silvering solution is poured into the box until its surface just reaches the lower surface of the glass sheet which has previously been cleansed with a dilute potash solution and rinsed with distilled water. The silver is soon precipitated on the glass. The longer the contact, the thicker the coat. The sheet is then taken out of the bath, the coated surface rinsed with distilled water, dried at ordinary temperature, and finally coated with varnish.

For gilding, three solutions are required, one being metallic gold in aqua regia (1 part of pure nitric acid to 3 parts of pure muriatic acid), the other consisting of caustic soda in distilled water, and the third being the reducing solution composed of starch sugar, dissolved in distilled water, alcohol, and aldehyde. The process employed for gilding is otherwise the same as for silvering.

## THE JOLY PROCESS: FURTHER IMPROVEMENTS.

DR. JOLY has made some further improvements in his process of colour photography, which he describes in the Patent specification:—

"In my Patent, No. 14,161, 1894, I describe a process of colour photography in which the image is subdivided into minute linear areas overlaid by similar areas in certain transparent colours. My present invention relates to a mode of obliterating the linear nature of the image or rendering this linear character less conspicuous.



"To this end I superimpose upon the system of linear image overlaid by linear colours a minute linear or other pattern in a transparent medium, such as glass, gelatine, celluloid, &c., this pattern being in relief and depression in the transparent medium and not consisting of opaque or clear areas. Thus, in the case in which this transparent pattern in relief is linear I arrange that the lines of this pattern shall cross the lines of the image obliquely or otherwise. The effect is to break up the linear image and still preserve its full transparency or almost so. This result is due to the refraction of the rays passing through the transparent pattern.

"The transparent pattern may be borne or impressed on the reverse side of the transparent plate carrying the colours, or it may be borne or impressed on the reverse side of the plate carrying the positive photographic image, or upon a separate transparent plate, which may be affixed to the finished picture or attached to a stand upon which such picture is viewed, or placed in the carrier of a projecting lantern.

"In order to produce such transparent linear patterns in relief I may proceed as follows: If it is desired to impress the pattern on gelatine, the glass or celluloid support is coated with bichromatised gelatine and then exposed to light beneath a screen having the required pattern in opaque and clear, whether a linear or other pattern. Thus, a Levy screen may be used. After exposure, the shaded parts are removed by solution in the usual manner. The required pattern now remains. If it is desired to produce the pattern in glass, the glass support, treated as above, is further treated with aqueous solution of hydrofluoric acid for a short time and then scrubbed to finally remove the gelatine. The pattern now appears on the glass.

"The pattern may be produced in other ways, as by casting the transparent material in a mould having the required pattern in relief; by coating with a greasy varnish, removing this in a linear pattern by aid of a graver or comb, and then etching with acid or otherwise.

"The transparent pattern acts best when raised or depressed in forms which in cross section are lens-shaped or rounded. In the mode of procedure described above for producing the pattern by etching on glass, this result is brought about by the graduated action of the acid through the gelatine. To this end, also, alight separation of the Levy screen and the gelatine when printing may in some cases be advisable."

The following are Dr. Joly's claims:—

1. The combination of a minute transparent pattern, linear or other, in relief and depression in a transparent medium, with a linear image in colours, so as to refract the lines of the coloured image, and thereby reduce or annul the linear appearance of the latter.

2. The combination of a minute pattern, linear or other, in relief or depression, on a transparent medium with a transparent linear image in colours, and either carried on the reverse of the screen bearing the colours, or on the reverse of the positive image, or on a separate plate affixed over the picture or temporarily applicable thereto.

3. The combination of a transparent plate, having a minute pattern raised or depressed on its surface, with a stand for viewing transparent photographs, or with a carrier for projecting the same by the aid of a lantern.

#### PLATES FOR PHOTO-MECHANICAL PRINTING.

The invention for the purpose is thus described by the author, Mr. Alfred Henley:—

"I take a sheet of lead, most conveniently, perhaps, of as pure a quality as may be reasonably possible or can be readily gotten, and therefrom I make a plate of the desired size and shape, preferably very thin (say about from  $\frac{1}{16}$  to  $\frac{1}{8}$  inch in thickness, and the surface thereof can preferably be made in any ordinary and appropriate manner as smooth and plane as may be practically possible or can easily be effected. This plate is placed in a suitable bath, wherein soda has been dissolved in water in about the proportion of 1 ounce soda to 1 gallon water, which bath is, by any convenient means and appliances, heated up to the boiling point, and is kept at such temperature (or thereabouts) while the plate is immersed therein for the space of about half an hour. The plate, by any customary means, is then caused or allowed to dry, when it is thoroughly washed with liquid ammonia, of a strength of about '880, and is again caused or allowed to dry, and then can conveniently be warmed, as is customary.

"The plate then, in any ordinary manner, is coated with the sensitive film, which can, when desired, be made as is usual in this class of photographic work, but the film that I especially and preferably use is composed of the following ingredients, namely, gelatine, bichromate of potash, and water, in about the following proportions, that is to say—1 ounce gelatine and 180 grammes bichromate of potash to 8 ounces of water, which are duly mixed and treated as is customary, and then applied on and to the plate in such quantity and to such thickness as may in each particular case be desired. Then the plate so coated is dried in any ordinary drying oven or other appropriate apparatus at a temperature of about 80° F.

"This sensitive plate can be exposed to light under any ordinary photographic negative as is customary, and during and after such exposure can be treated in manner as is an ordinary colotype or other similar plate and with similar appliances and substances, as may be

desired or necessary and may be customary, until it is ready for the next stage of its treatment.

"This stage consists, as is customarily the practice, in treating the surface with an 'etching solution,' but the 'etching solution' that I use is composed of the following ingredients, namely, liquid ammonia of a strength of about '880, glycerine and water in about the following proportions, that is to say,  $\frac{1}{2}$  ounce ammonia and 6 ounces glycerine to 4 ounces water. This 'etching solution' may be applied to, and used with and on, the surface of the plate in any ordinary manner, where, and how, and when, and to what extent may be necessary or expedient in each particular plate as is customary in this art.

"The face of this plate so prepared can then be treated with transfer ink in any ordinary manner, whether by rolling such ink thereon, or otherwise, when transfers can be taken therefrom in manner as is customary, and as may be convenient and suitable in and for each particular plate, and such transfers can be used in the ordinary manner in and for their required and customary purpose.

"The consequence of making and treating the plate in manner aforesaid, and of and with the particular materials hereinbefore mentioned, is that a 'grain' or a 'texture,' or the like, is produced on and in the film, which therefore has a surface very different from the ordinary surface on the ordinary plate; and it is this 'grain,' or the like, which, contrary to the usual procedure, allows a transfer to be taken from this plate, and then to be placed and used with acceptance directly on the stone or other surface for printing purposes as is desired.

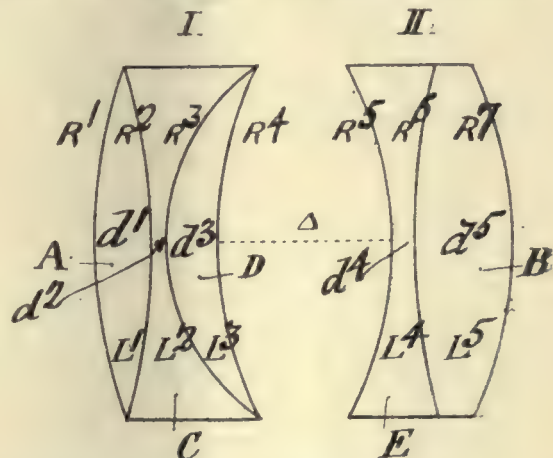
"The particular 'grain' or 'texture,' or the like, on and in any particular film can be varied by varying the temperature at which the plate carrying the same is dried. If such temperature is lowered below the 80° F. aforesaid, by, say, about 5°, or even 10°, then the 'grain,' or the like, will be proportionately larger, coarser, or more open; while, if such temperature is raised above the 80° F. aforesaid by, say, about 5°, or perhaps even 10°, then the 'grain,' or the like, will be proportionately smaller, finer, or closer."

#### RECENT IMPROVEMENTS IN PHOTOGRAPHIC LENSES.

HERR E. LEITZ.

A DOUBLE lens has been used, in which the crown glass has stronger refractive power than its attendant flint glass, the crown glass is biconvex and the flint glass biconcave. This double lens enables a high astigmatic correction to be made, and this has been recognised and led to a further form of lens, in which astigmatic, spherical, and chromatic correction has been so made in each of the triple lenses that either of the latter can be used alone as a photographic objective.

Experiments have shown that the spherical correction was so far behind with regard to the importance of the astigmatic correction that objectives in which the rays falling in an axial plane were brought into conjunction could only be used over about one-third of the theoretical opening. This disadvantage in the lighting power of the objective is attributable to the



fault of astigmatic correction, and a subsequent computation of the rays which do not fall in an axial plane has confirmed this proposition.

The influence of these unaxial rays, which increase with the enlargement of the opening of the objective, pointed the way to the construction of an objective in which the number of the astigmatic correction members exceeded that of the spherical correction members.

Such an objective is illustrated in the annexed drawing:—A and B are two biconvex lenses turned, respectively, towards the object and towards the image. The objective as a whole consists of two unsymmetrical members, of which that marked I, towards the object, consists of three parts, namely, a biconvex lens, a, a biconcave lens, c, and a meniscus, DE. The other member, marked II, turned towards the image, is a dual comb-



bination, and consists of the biconvex lens, *a*, towards the image, and the less refractive biconcave lens, *w*.

The two biconvex lenses,  $L^1$ ,  $L^5$ , which are more refractive than the following biconcave flint lenses,  $L^2$ ,  $L^4$ , give the astigmatic correction. The curve,  $n^3$ , gives the spherical correction as in the cemented curve of an applanatic lens. The inner member is a meniscus of crown glass of less refractive than that of the flint glass lens cemented to it.

As this radius is the only means of correction of spherical distortion, neither the triple nor the dual combination can be used alone, but the combination of the two must be looked upon as a single system.

As an example of an objective with the above-described properties, a system of focal length 240 mm. and an opening of  $f/8$  would have the following measurements:—

$n^1$ 44.3 mm.	$n^5$ 39.0 mm.
$n^2$ 70.7 "	$n^6$ 85.0 "
$n^3$ 17.1 "	$n^7$ 43.0 "
$n^4$ 45.1 "	$d^4$ 2.5 "
$d^1$ 7.1 "	$d^5$ 10.0 "
$d^2$ 2.0 "	$\Delta$ 13.7 "
$d^3$ 4.8 "	
$L^1 = L^5$ $n b$ 1.6112	
$n f$ 1.6187	
$L^2$ $n d$ 1.5514	
$n f$ 1.5587	
$L^3$ $n d$ 1.4967	
$n f$ 1.5020	
$L^4$ $n d$ 1.5366	
$n f$ 1.5444	

The claim is for a photographic objective corrected for spherical, stigmatic, and chromatic errors consisting of two unsymmetrical combinations (*i* and *u*), each having on the outside a biconvex lens (*A* and *B*) and inside thereof a biconcave lens (*C* and *E*) of smaller refractive index, and on the inner side of the combination forming the member (*i*) nearer the object a meniscus (*D*).

## RECENT IMPROVEMENTS IN PHOTOGRAPHIC LENSES

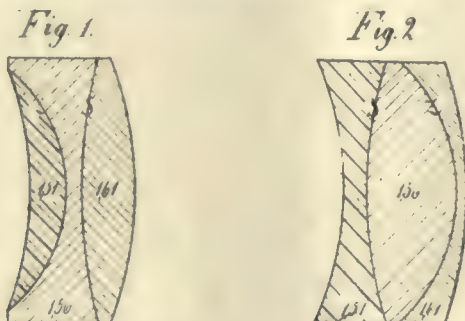
MESSRS. GOERZ & VAN HOUGH.

THE patentees point out that photographic objectives have been previously constructed consisting of three lenses, in which spherical and stigmatic distortions are corrected by each two lenses following one another, and cemented together, containing a dividing plane giving a light dispersion and one for light concentration.

Figs. 1 and 2 show the arrangement of such objectives in axial section. In both objectives a lens of medium refraction is enclosed between a lens of smaller and one of greater refracting power. In the form of fig. 1 the enclosed lens has a negative, the enclosing lenses a positive focal distance; in the form of fig. 2 the enclosed lens has a positive and the two others a negative focal distance.

In both cases, by the light-dispersing cemented plane, *z*, means is given for compensation of the spherical deviation, and, by the light-concentrating plane, *s*, means for correcting stigmatic deviation.

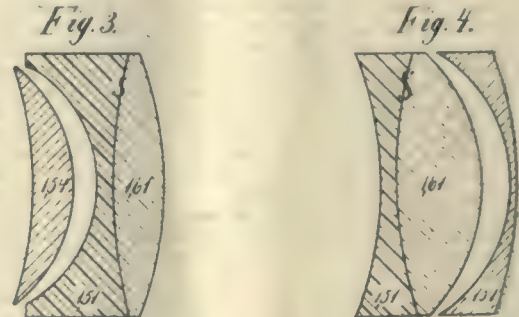
The operative opening, which can be given to systems of this kind, and thereby the illuminating power of the objective, is dependent upon the size of the difference between the refractive indices of the kinds of



glass meeting at the cement places, because, the smaller these differences, the deeper curves the cemented planes must have to compensate for the before-mentioned faults; but the curvature of these curves must not surpass a certain admissible amount, otherwise the distinctness of the picture received by the objective would be destroyed. The refracting indices of those kinds of glass which can be used for such objectives lie within the values 1.51 and 1.61, and hence the middle glass has a refractive index between these limits; the differences of the refractive indices can, on the average, therefore not exceed 0.05.

In order to have a greater illuminating power, without augmenting the number of the lenses, and while preserving the distinctness of the

picture and the correction of all faults, they do not use, as in the above-mentioned objectives, a light-dispersing cement plane, but this correction is attained by the lenses at the place, *z*, receiving, not the same, but different, radii of curvature, so that the curve of the negative lens is greater than that of the positive lens, and so that between both now distanced lenses an air space of the form of a positive meniscus is formed. In consequence of this arrangement, it is no longer required that, for correcting spherical deviation, the negative lens should have greater refractive index than the positive one, or, what is the same, that the enclosed lens should be made of a glass of a medium refraction, but one can, in this case, make the middle lens, when it is a biconcave negative one (fig. 3), of very low refracting glass, or, if it is



(fig. 4) a biconcave positive lens, of a glass as strongly refractive as possible. The direct consequence of this is that in both cases, at the light-concentrating cement plane, *s*, two species of glass of very great difference of refractive index meet together, and that consequently this plane compensates for stigmatic deviation, with notably less curvature than was formerly possible.

An advantage of this new arrangement of the lenses, which is not less important than the augmented light power and distinctness of the picture is, that with it, it is also possible to meet the so-called requirement of sine in every single system to the fullest extent, that is to say, it is possible to take also into account the distinctness of the picture obtained by the single system itself of oblique falling pencils of rays, while using the full objective opening, by the possibility of annulling the coma in a certain direction of the chief ray, which was not possible with cemented three-lens systems, in which other faults have been completely compensated.

The numbers inscribed on the drawings give the coefficients of the kind of glass used for the respective lenses. The cemented plane, *s*, concentrates the light; the plane, *z*, disperses the rays.

It is clear, without further explanation, that one can put together two of the described lens systems, and can use them as a compound objective.

The claims are:—

1. A three-lens system for photographic purposes, formed by a cemented meniscus of two lenses, one biconcave lens of lower and one biconvex lens of higher refraction, in conjunction with

(a) Either a meniscus of positive focal distance put in front;  
(b) Or a meniscus of negative focal distance put behind,  
wherein the surfaces, lying one opposite one another, have such curvatures that between the single and the cemented meniscus an air space in the form of a positive meniscus is formed.

2. A compound or double objective formed of two-lens systems as in Claim 1.

## PICTORIAL STEREOSCOPIC CARDS.

HEER OTTO HYMMEN has devised means for utilising stereoscopic photographs in the following manner:—

1. On correspondence cards or the like of all kinds serving the same objects as the well-known picture post cards, but more completely in so far as they allow the object of the representation to appear not as a surface picture, but, by the help of a stereoscope, as corporeal and plastic images.

2. On cards or strips for reproducing instantaneous exposures, following one another in rapid succession, of moving objects with the object of producing spacious living pictures by the combination of the stereoscope and the kinoscope, cinematograph and other like apparatus.

3. On cards or strips for teaching by sight within the domain of natural sciences, architecture, technology, industry, manufactures and the like. It is not desired to cover cards with stereoscopic figures for the study of stereometry, spherical trigonometry, displayed geometry and crystallography, as such as are already known.

4. On cards or strips for reproducing patterns or samples, machines, and manufactures for replacing the original patterns or samples more particularly where the weight of the article or its heavy composite mould or form hardly admits of or entirely prevents the sending or transportation of the original pattern or the making of a drawing.

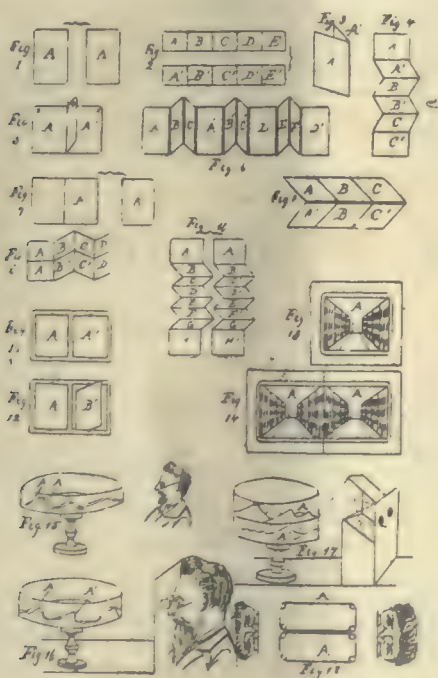


The cards or strips with stereoscopic representations may consist of cardboard, paper, celluloid, or any other suitable material, and, of course, such cards or strips may be bound or fastened together to form books, albums, rolls, series or the like.

Correspondence cards, letter paper, and the like, which have hitherto only been provided with simple (flat) views or pictures (such as illustrations of the locality from which the correspondence is dispatched) are by this invention provided with two related views of the same subject forming a stereoscopic pair. A postal card, letter, or the like, having such a stereoscopic pair imprinted as a heading or at some other suitable part, thus becomes of greater interest to the person receiving it, as by placing it in an ordinary stereoscope a plastic or relief view may be had which is much superior to the usual flat simple views.

In the application of the invention to the reproduction of instantaneous exposures with a stereoscopic effect, Herr Hymmen arranges two sets of a series of pictures one on each of two endless or continuous strips, the related pictures of each set forming stereoscopic pair, when appearing side by side as shown in fig. 18, in which the views on the band, A, form stereoscopic pairs with those on the band, A'. Stereoscopic sight-holes are provided as shown, and the bands may be put in motion by any of the known mechanisms usual in kinetoscopes or cinematographs. Spacious animated pictures may thus be produced.

The strips of views in stereoscopic pairs may similarly be applied to a zoetrope or round panorama, as shown in figs. 15, 16, and 17, instead of the ordinary single or flat views. In the arrangement shown in fig. 17,



in which the strips are arranged one over the other, it is necessary to provide a suitable arrangement of mirrors to one of the sight-holes so as to make the strip, A, appear to the sight on the same level as the strip, A'. In figs. 15 and 16, the pairs are arranged side by side on a single strip.

In the application of the invention to teaching by sight, and also for reproducing views of patterns, samples, machines, and manufactures, and the like, double pictures forming stereoscopic pairs are provided in place of the usual simple (flat) pictures. These stereoscopic pairs may be mounted or arranged in a variety of ways. For instance, they may be mounted side by side in position for viewing in the stereoscope as shown in fig. 14, or each picture of a pair may be mounted separately as in figs. 1 and 13, and a suitable frame be provided whereby the two related pictures, A A', may be held together when required. This loose arrangement of each picture of a pair allows of the single pictures being utilised as ordinary single or flat views when not actually in use in the stereoscope. By this means the inartistic effect of two similar pictures being exposed to view side by side on a single mount may be avoided when the views are out of the stereoscope. Fig. 11 shows such a frame with separate pictures, A A', forming a stereoscopic pair on the backs of which are other pictures forming another pair. By reversing one picture, say A', when not in use in the stereoscope, one picture only for each pair (i. e., A, A') will be exposed (fig. 12), thus avoiding the inartistic effect of repetition as before stated. Fig. 3 shows the related pictures of a pair connected with a hinge movement for the same purpose.

Where a series of stereoscopic pictures are required, they may be arranged in strips which may be either flat or made to fold. Figs. 4 and 5 each show a folding strip, but with the related pictures of each pair

arranged in series in fig. 4 and in parallel in fig. 9. Two separate folding strips may, however, be used for the pictures of each pair as in fig. 10, the "lefts" being on one strip and the "rights" on the other strip. Fig. 8 shows another arrangement in which two strips are hinged together so as to be adapted to show the pictures separately or in pairs, and fig. 2 a similar arrangement on two separate flats. Fig. 6 shows a folding arrangement in which the related pictures of stereoscopic pairs are separated to avoid the inartistic effect before pointed out, but allowing of any pair being brought together when required for use with the stereoscope.

Where the pictures are bound up in book form the related pictures of a pair may be placed, the "left" on page 2 and the "right" on page 5, as shown in fig. 5, the intermediate leaf, that is pages 3 and 4, being utilised for descriptive matter and acting also as a partition wall for the stereoscope, or the one picture only of each pair may be bound up in the book, and the related pictures to complete the stereoscopic pairs be provided in the form of a supplement to the book as shown in fig. 7.

#### AT THE CAMERA CLUB.

MONDAY last week was a kind of Open Night at the Club, in the sense that there was no fixed lecture or settled programme. Members were invited to exhibit and explain any novelties which might have come under their notice, or which they themselves might have evolved from their inner consciousness. Such evenings are, as a rule, by no means barren of results, and many a useful thing has on these occasions made its first bow to the photographic public. One hopeful sign there was in the circumstance that Mr. Inwards occupied the chair, for this gentleman has the happy knack of seeing the merits of a thing at a glance, and can explain its advantages with clearness and precision. He first called upon Mr. Teale to show a new form of camera which that member of the Club had recently constructed.

The novel feature of this camera is that it requires no focussing glass or screen, this duty being performed by a view-finder coupled with a mirror. The mirror works upon a pivot, and is so adjusted that when the view is correctly focussed half of the image is seen in the view-finder and the other half in the mirror. We hope to have the opportunity of publishing a sketch of the apparatus later on, without which it is impossible to describe it in a more detailed manner.

Dr. Lindsay Johnson was next requested to exhibit an apparatus which he had constructed to test the speed of shutters. He reminded his hearers that he had previously distinguished himself by the invention of many things of no use to anybody, but he trusted that the contrivance which he now showed would not come under the same category. Shutters were most deceitful things, and he found that most of them professed to move about ten times quicker than they actually did. When you see one which is estimated to work at  $\frac{1}{1000}$  second, it is best to disregard it, and meditate upon the story of Ananias and Sapphira his wife.

The apparatus in question takes the form of a small box, in which, by a clockwork movement, a disc pierced by four equidistant holes revolves against a fixed disc pierced with many more holes at stated intervals. By holding the apparatus up to the light, and interposing the shutter to be tested between it and the eye, at the same time regulating the speed of the revolving disc to, say, one turn per second, it is possible, by noting the number of holes visible at the moment of releasing the shutter to calculate its rate very accurately. Dr. Johnson concluded his demonstration by presenting the apparatus to the Club, for the use of the members, a statement which immediately evoked a hearty vote of thanks.

It may be noted that the Camera Club has among its members many who devote themselves to mechanical pursuits, and some of these gentlemen were now called upon to show specimens of their ingenuity. As these exhibits were not photographic in their nature, we cannot consider them here; but we may make an exception in the case of several new patterns of drawing-pens, shown by the Chairman, for a photographer often finds this form of pen necessary in his work. These pens showed much ingenuity in overcoming faults inherent to the ordinary instrument.

Mr. Lyon showed a very ingenious form of instrument for drawing a parabola, which he had previously exhibited at the Royal Society. Mr. Inwards stated that he had made one of somewhat similar design, and that he had subsequently found that he had been anticipated by a Dutchman who lived about three centuries ago, and had published a drawing of the contrivance in a Latin work of that date.

That such an apparatus, old as it was, was wanted in our English workshops might be judged from the circumstance that all our warships, big and little, required parabolic reflectors for their searchlights, and he had ascertained that these were made at Nuremberg at a cost of 100l. a piece, because they could not be manufactured in this country.

Dr. Johnson detailed a curious discovery which he had made in his examination of the eyes of different animals in the Zoological Gardens, and that was that, without exception, the cornea of the eye of mammals exhibited a parabolic curve, and was not spherical. By pressing a plastic substance on the eye, subsequently making a plaster cast from the mould thus formed, and cutting the cast in half, he was able to ascertain this fact. It may be mentioned that Dr. Johnson has on former occasions explained to the Club the various optical devices by which he is able to distract the attention of the fiercest animals whilst examining their eyes



—methods which would possibly never occur to a less able and resourceful operator.

On Thursday, the 20th ult., Chief-Justice Ryner of Lagos gave a picturesque description of this little-known colony of ours on the West Coast of Africa, especially interesting because it is one of our most recent acquisitions, British possession of it dating only from the year 1861. The lecturer has had ten years' experience of the country and its people, and was able to give a very clear account of the place. Moreover, his photographs, taken under great difficulties, were singularly good and evoked much applause. As the lecture was not of photographic interest, we do not give any detailed account of it; but it is interesting to note that the lecturer, like so many other photographers who have worked in tropical regions, complains sadly of his plates frilling. He tried all kinds of remedies, and finally gave the matter up as a thing which could not be cured, and must therefore be endured. "It cannot be helped," he said, "many films bearing what you think will turn out to be fine negatives float entirely off the plate." Alum, before and after fixing, seemed to afford the best check. Some plates frilled more badly than others, but none were free from the fault. His developer was pyro potash.

On the following Monday Mr. T. C. Hepworth gave a lecture and demonstration, his subject being the new apparatus called the Biokam, for taking and exhibiting animated photographs. As this instrument has already been described in our columns, it will not be necessary to enter into any details of its construction; but we may mention that Mr. Hepworth adopted a plan for showing the audience the construction and working of the instrument which might often be adopted by lecturers with advantage to themselves and their hearers. He showed a series of lantern pictures which exhibited every movement and phase of the new instrument. If a button had to be pressed here, or a catch raised there, a picture was shown with a finger doing the work. This was, of course, far better than the usual plan of holding up at the lecture table an article far too small for any one to see perfectly, or handing round the machine for individual examination.

Thanks to these lantern pictures, the Biokam was thoroughly understood by the audience by the time the demonstration of its projecting powers took place. About one dozen films were thrown on the screen by means of an electric lantern, the magnification being no less than 100 diameters. In spite of this strain the details of the pictures came up well, and there was plenty of illumination. It was pointed out that the pictures must be regarded as experimental ones, for it was impossible to attain perfection at the first attempts, and of late the weather had militated against first-class photography.

A very interesting discussion followed with regard to the pioneer efforts to produce action upon a lantern screen—a discussion in which Lord Crawford, Mr. Stroh, Mr. Bros, Mr. Gambier Bolton, and others took part. All agreed that the instrument which had been shown was most ingenious in construction, and was wonderfully compact considering the many purposes it was designed to fulfil. Mr. Humphrey occupied the chair, and conducted the proceedings with his usual tact and kindliness.

#### EXHIBITION OF THE WEST SURREY PHOTOGRAPHIC SOCIETY.

THE West Surrey Photographic Society held its Eleventh Annual Exhibition of members' work on the Wednesday, Thursday, Friday and Saturday, of last week at the Railway Hotel, Battersea-rose, S.W.

The Society has changed its quarters since the last Exhibition, but has been fortunate enough to secure a meeting room which answers admirably as an exhibition gallery. The number of photographs at this year's Exhibition was perhaps a little smaller than usual, but the average quality had not fallen off. We missed the work of the late President (Mr. G. H. James), but his influence was plainly shown in many of the exhibits, and naturally the gum-bichromate process was strongly in evidence, E. Pointon and S. W. Wensum in particular being exponents of this method of printing. The Judges were Colonel J. Gale and Mr. J. Taylerson, and they were empowered to make one award in each of the three classes. The award was withheld in the Portrait and Figure Class, but we could not help thinking that a little figure study by Mr. A. W. Curtis must have entirely escaped their notice. It was certainly one of the best things in the Exhibition. In the landscape class, the awards were made to Messrs. H. P. Hoad and W. H. Wilshe, and in the Class for Seascapes to Mr. T. E. Meadowcroft. In addition to the exhibitors whose names have already been mentioned considerable work was shown by the President (Mr. J. T. Price) and by Messrs. J. Bulbeck, G. Bottle, and C. Shead.

One of the most interesting features of the Exhibition was a collection of studies of fruit and vegetables, the result of one of the Society's competitions, the principal examples being by Messrs. E. W. Burch, A. W. Curtis, E. Pointon, and W. H. Wilshe. Of the collection we can speak in unqualified praise. Such subjects are not very frequently treated by photography, and in hitting upon such a novelty in the way of subjects for competition an opportunity has been given to prove that many of the prosaic articles of every day life lend themselves to pictorial effect when suitably dealt with.

## Our Editorial Table.

### "CALCIUM" PAPER.

L. Trapp & Co., 29, Budge-row, E.C.

MESSRS. TRAPP are placing on the market a new collodio-chloride paper, "Calcium," which is issued with both glossy and matt surfaces. Rapidity of printing, freedom from curling, excellence of tone, and permanence of results are amongst the characteristics claimed for the new paper, with which we have been very pleased. Full instructions for the use of a variety of toning baths are issued with the paper, of which many Continental photographers speak highly. As we have many times before pointed out, owing to the chemical inertness of the vehicle a collodion paper has particular claims to the notice of the photographer. In physical respects we find this one to behave admirably.

### THE CADETT ORTHOCHROMATIC LIGHT-FILTER.

MESSRS. CADETT & NEALL are issuing the following notes on the use of their orthochromatic light-filter: These light-filters are adjusted for the rapid series of the spectrum plates, and will render all colour luminosities correctly, with a small margin of error. Each light-filter is carefully tested by Mr. Cadett with the latest improved form of Captain Abney's colour sensimeter. The filters are of no use for any other orthochromatic plate than the Rapid Spectrum series. The best and most easily arranged position for the filter is immediately behind the lens in the camera, care being taken to exclude all reflected light between the filter and the lens. The filter can, however, be placed in any suitable position. Care should be taken to avoid leaving the filter in direct sunshine or long-continued daylight; when not in use, it should be kept in its case. The surfaces being optically worked, the filter should be treated as a lens, and every care taken to avoid scratches.

The colour luminosities are rendered as they appear to the eye, in the quality of the light by which the subject is photographed. By special order, the filters can be paired for stereoscopic negatives.

The following developers are recommended for use with the spectrum plates:—

#### No. 1.

##### PYRO-SODA DEVELOPER.

##### Stock Solution.

Pyrogallie acid.....	1 ounce.
Potassium metabisulphite ...	30 grains.
Distilled or soft water to make altogether .....	9 ounces fl. and 55 minims.

Every 10 minims of stock pyro solution contains 1 grain of pyrogallie acid.

A.—Stock solution .....	8 ounces fl.
Distilled or soft water to make altogether ...	20 "

B.—Sodium carbonate cryst. (washing soda, select translucent pieces) .....	350 grains.
Sodium sulphite cryst. ....	700 "
Distilled water to make altogether .....	20 ounces fl.

Equal parts of A and B to make developer.

#### No. 2.

##### METOL DEVELOPER.

##### One Solution Only.

Distilled or soft water .....	80 ounces fl.
Metol .....	1 ounce av.
Sodium sulphite (pure recryst.) .....	5 ounces.
Sodium carbonate (cryst.) (washing soda, select translucent pieces) .....	6½ ounces.
Or instead anhydrous sodium carbonate .....	2½ "

##### HYDROQUINONE DEVELOPER.

A.—Hydroquinone .....	120 grains.
Sodium sulphite (recryst.) .....	250 "
Potassium metabisulphite .....	8 "
Distilled or soft water to make altogether ...	20 ounces fl.

B.—Sodium carbonate (cryst.) (washing soda, select translucent pieces .....	2½ ounces av.
or	
Sodium carbonate anhydrous.....	360 grains.
Distilled or soft water to make altogether ...	20 ounces fl.

Equal quantities of A and B to make developer.

##### FIXING BATH.

Hypo .....	1 pound.
Water .....	1 quart.



## FERROUS OXALATE DEVELOPER.

A.—Neutral oxalate of potash .....	1 part.
Distilled water .....	4 parts.
B.—Protosulphate of iron .....	1 part.
Citric acid .....	1½ "
Distilled water .....	3 parts.
C.—Potassium bromide .....	1 part.
Distilled water .....	3 parts.

For use, take A, 100 parts; B, 25 parts; C, 10 parts.

## CATALOGUES RECEIVED.

FROM MESSRS. HARRINGTON BROTHERS, 4, Oliver's-yard, City-road, E.C., we have received their April price-list of chemicals used in photography.

MR. JAMES D. GRIFFIN, of Floodgate-street, Birmingham, sends us his catalogue of photographic and microscopic glass. This is a useful list of twenty pages devoted to lantern and camera glass; positive glass; opalines, backs and boxes; vignetting glasses; plate-glass cutting shapes; matt-surface opals; ruby, orange, and other coloured glass; dark-room lamps; microscopical thin glass (in squares and circles); glass slides in sheet, crown, and patent plate, also with cavities in centre, &c.

We have also received "Results of Meteorological and Magnetical Observations in 1898 at Stonyhurst College Observatory," by the Rev. W. Sidgreaves, S.J., F.R.A.S.; "On the Reflection of Cathode Rays," by Mr. A. A. Campbell Swinton (a paper read at the Royal Society on February 9); *La Photographie Anisée*, by Boleslas Matuszewski, published at 8, Rue Campagne-Première, Paris; the *American X-Ray Journal* for March; "The Colour Principle of Trichromatic Printing," a lecture by C. G. Zander, read at a meeting of the Institute of Printers and Kindred Trades of the British Empire on April 19; *Principles et Pratique d'Art en Photographie*, by Frederic Dillaye (Paris: Gauthier-Villars).

## News and Notes.

THE Oxford Camera Club has commenced the issue of printed proceedings to be published three times a year.

PHOTOGRAPHIC CLUB.—May 3. Demonstration of the Weiss Flashlight Apparatus, by Mr. Reinhold Thiele.

THE Earl of Crawford will preside at the Annual Dinner of the Camera Club, to be held at the Club House, Charing Cross-road, W.C., on Thursday evening next, May 4.

PARIS EXHIBITION, 1900, AND PATENTS.—Interested parties may see at the London Chamber of Commerce the full text of the law regarding the protection to be granted to patents, &c., which may be exposed (in a technical sense), at the Paris Exhibition of 1900.

THE management of the Canterbury Music Hall send us a half-tone picture of the members of the company now appearing at that popular place of entertainment. There are forty-five portraits, and a key block is supplied. The original photograph was taken by Mr. E. Sharp.

CRIPPLEGATE PHOTOGRAPHIC SOCIETY.—The next meeting of this Society will be held on Monday, May 1, when Mr. F. O. Bynoe will deliver his popular lecture, "Camera and the Wheel." Tickets of admission can be had of the Hon. Secretary, Mr. Alfred T. Ward, Cripple-gate Institute, Golden-lane, E.C.

MESSRS. MAWSON & SWAN, of Soho-square, London, and Moseley-street, Newcastle-on-Tyne, announce a competition open to all users of their dry plates and films. One hundred and twenty pounds are offered in sixty prizes, and there is no entrance fee. Prospectuses giving full particulars may be obtained of the firm at either of the addresses named.

THE Holland Fine Art Gallery, which is being established in London at 235A, Regent street, W., with the object of introducing the art of the Netherlands more fully to the British public, will open shortly with an Exhibition of paintings by famous masters, including examples by J. Bosboom, Israëls, Manve, Mesdag, M. Maris, Nuhuys, W. Maris, J. Maris, Poggenbeek, and others.

A NEW use has been found for the motor cab. A woman having broken her leg in the street, a motor cab and a doctor were telephoned for, and arrived simultaneously. The doctor brought an X-ray apparatus, and the cab brought the battery. The two being combined, an excellent skiagram of the lesion was obtained, and suitable first aid rendered. The battery was then disconnected from the Röntgen tube, and by its means the cab took the woman to the hospital.

THE members of the Edinburgh Photographic Society had their first outing for the season on Monday, 17th inst., under the leadership of Mr. A. Eddington, F.J.I. The places visited being Selkirk, Newark Castle, Bowhill, and Oakwood Tower. The weather conditions were all that the most fastidious photographer could desire. In the evening the members dined together at the Selkirk Hotel. On the motion of the Librarian (Mr. J. Anderson) a hearty vote of thanks was accorded the lender for his excellent services, the Librarian mentioning at the same time that this had been one of the most successful outings ever held by the Society.

AT Exeter on Tuesday was opened a very attractive exhibition of photography, under the auspices of the Exeter Camera Club. The Exhibition remained open until Friday. The arrangements were admirably carried out by the Hon. Secretary, Mr. C. R. M. Clapp, assisted by the Committee of the Club. It was entirely a loan collection—no medals or other prizes being offered—and comprised 163 frames. Of these, twenty-one were lent by the Glasgow and West of Scotland Association, ten by the South London Society and fifty by the Birmingham Society, whilst the Exeter Camera Club showed seventy-five. The Exhibition, as it stood, was somewhat smaller than its predecessor last year, but was generally considered to be an advance artistically, the contributions of local members showing marked improvement.

EXHIBITION AT ROTHERHAM.—The Tenth Annual Exhibition of the Rotherham Photographic Society was held in the Drill Hall, Rotherham, on Thursday, Friday, and Saturday, April 20, 21, and 22. The opening ceremony was performed by Major C. J. Stoddart, J.P., in the presence of a fairly large company. Dr. Baldwin (the President) occupied the chair. The Members' Work and Loan Collection were most effectively displayed, bays having been arranged and special lighting facilities provided. Compared with previous years, the standard, from the Society's point of view, was well maintained. Twenty-one members sent exhibits, and, although largely topographical, with a leaning towards architecture, there were, nevertheless, some very effective subjects. Careful technique was noticeable, but some of the landscapes suffered through lack of suitable clouds. It should be mentioned that many of the examples were, doubtless, intended for the Photographic Survey collection. The contributors in the Members' Section were Miss Crossley, Messrs. G. B. Brook, J. Caseldine, J. Clark, J. C. Cox, W. J. Dawson, Wm. Firth, W. E. Garsed, B. Godfrey, A. R. Habershon, H. C. Hemmingway (Hon. Secretary), R. H. Law, J. Leadbeater (Vice-President), A. S. L. th (Hon. Treasurer), W. Mason, G. T. M. Rackstraw, J. Turner (Vice-President), P. G. Turner, J. W. Stamp, C. H. Sutton, and F. A. Winstanley. Mr. Leadbeater's series of reproductions of old engravings were exceedingly interesting. The Loan Collection included the Royal Photographic Society's series, and examples by the Autotype Company, London; Mr. Worsley Benison, Chesham; Mr. T. A. Scott, Derby; and Mr. T. G. Hibbert, Sheffield. The trade firms giving their aid were Messrs. R. & J. Beck, Limited, Cadett & Neall, Elliott & Sons, J. J. Griffin, Limited, Kodak Limited, Marion & Co., Paget Prize Plate Company, and Wellington & Ward. Each evening there were lantern shows, the members' slides being supplemented by the series of the Royal Photographic Society. The Eastwood Orchestral Band played choice selections, and there was enjoyable vocal music contributed by friends. On Saturday evening the Rotherham Borough Prize Band gave their services. Generous support was forthcoming from the public, and the Sheffield societies sent a fair representation. Several sales of members' work took place, and the money thus received will be handed over to the Treasurer of the Rotherham Hospital.

## Meetings of Societies.

## MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
1.....	Bradford Photo. Society ....	{ With Cycle and Camera in Lakeland. G. Thistlethwaite.
1.....	Camera Club .....	Opening of Members' Exhibition.
1.....	Cripple-gate Photo. Society .....	Camera and the Wheel. F. O. Bynoe.
1.....	Putney .....	Annual General Meeting.
1.....	South London .....	Prize Slides, 1898.
2.....	Ashton-under-Lyne.....	Demonstration on Developing.
2.....	Camera Club .....	Lantern-slide Evening: Lullus' Night.
2.....	Hackney .....	{ Some Simple Optical Experiments. Rev. F. C. Lambert.
2.....	Isle of Thanet .....	{ Demonstration: Plant and Flower Structure—How Best to Prepare as Lantern Slides. G. Dowker, V.P.
3.....	Croydon Camera Club .....	Sixth Annual Rummage Sale.
3.....	Photographic Club .....	{ Demonstration: The Weiss Flashlight Apparatus. Reinhold Thiele.
3.....	Woodford .....	Arrangement for Summer Outings.
4.....	Camera Club .....	Annual Dinner.
4.....	London and Provincial .....	Paper by W. T. Wilkinson.
4.....	Woolwich Photo. Society .....	Prize Slides.
5.....	Croydon Microscopical .....	Conversational Meeting.
6.....	Croydon Camera Club .....	{ Excursion: Beddington. Leader, W. H. Rogers.
6.....	Hackney .....	{ Excursion: Chislehurst. Leader, S. C. Stean.

## ROYAL PHOTOGRAPHIC SOCIETY.

APRIL 25.—Technical Meeting.—The Right Hon. the Earl of Crawford, K.T. (President), in the chair.

## SPECTROSCOPIC PHOTOGRAPHY.

THE HON. SECRETARY (Colonel Waterhouse) showed a print, sent by the Kodak Company, from a negative taken by Sir Norman Lockyer, of the arc spectrum of iron, with a comparison spectrum of the sun from wave-length 3600 to wave-length 5200. He read a memorandum, from which it appeared that Sir Norman had lately been experimenting with flexible film, with the idea of adapting it to spectroscopic photography. The large concave Rowland grating which he used had 20,000 lines to the inch, and was of 21½ feet radius, giving a spectrum of 30 inches in length; the focal plane of this grating being of necessity considerably curved, it was impossible to get a sharp photograph of the whole spectrum on a glass plate, but he had got over this difficulty by the use of the Company's flexible film bent to the



curvature of the field. The print shown was said to be the longest solar spectrum ever photographed at a single operation, being 30 inches long. Sir Norman Lockyer hoped, by using films at the next solar eclipse, to be able to obtain a greatly increased number of photographs, owing to the rapidity with which the film could be shifted in the short space of time available for photographic operations. It was stated that an apparatus for carrying films was in course of completion, which could be adapted to the spectroscopic cameras at present in use in the laboratory and observatory.

The PRESIDENT said he had never worked with a Rowland grating, but he had used a plane grating of about 23,000 lines to the inch and obtained a spectrum of about the same length as that shown; the focal plane, however, being by no means flat, he was compelled to use his glass plates in short sections so as to take chords of the arc. He believed that Dr. Copeland, the former director of his observatory, and now Astronomer Royal for Scotland, had for some time past utilised films for work of this description, and that therefore the use of flexible film in this direction was not absolutely new, but the photograph now exhibited was a remarkably fine one.

#### LIGHTNING.

Mr. J. Sterry submitted a photograph, presented to the Society by Mr. Wing, of a compound lightning flash. Mr. Glew, in a recent paper, had said that he had never seen a lightning flash consisting of more than three components, but this photograph by Mr. Wing had been examined by Mr. Glew, who found that it contained three distinct flashes—one single flash, one with two components, and one with either six or seven components.

#### GLASS DIAPHRAGMS.

Mr. T. Bolas, F.I.C., F.C.S., gave an exceedingly able and interesting demonstration of "The Making of Glass Diaphragms, Thin to Newton's 'Very Black' Stage," in the course of which he manipulated the blow-pipe and glass tubes with such dexterity as to draw from the President the remark that he deserved to be known as a "fairy-fingered Bolas." He pointed out that the thin glass of the bursting bulb must necessarily be much wanting in flatness, and that in its thinner forms, as he showed by experiment, it was a mere irregular fringe; moreover, it was seldom thinner than to give Newton's third order of colours (from about twelve to twenty millionths of an inch for flint glass). He then demonstrated the fact that approximately flat diaphragms of any thinness up to that giving Newton's blacks (from about one millionth of an inch to one three-millionth for flint glass), could be prepared by preparing a glass bulb, with a thin diaphragm across it, and two necks, one on each side of the diaphragm. This bulb being expanded by equal air pressure on both sides, the diaphragm could be slowly stretched to any required extent while kept hot by the surrounding mass of glass. The diaphragms thus made were approximately flat, and it was suggested that, being mounted in air-tight and convenient setting, they might lend themselves to many applications in demonstrative physics, especially in relation to phase reversal as affecting the theory of the Lippmann heliochromy, and also as to the greater limit in estimates of molecular magnitude. The thicker diaphragms, silvered, would form delicate manometric mirrors for photographic registration, while the thinner might form molecular filters of an altogether new class. The skill with which Mr. Bolas carried out his delicate demonstration was much appreciated by the meeting, and his ultimate success in attaining the "very black" stage was warmly applauded.

An informal discussion followed.

#### THE HALOID SILVER COMPOUNDS.

COLONEL WATERHOUSE exhibited some specimens of silver chloride, bromide, and iodide, produced by dry double decomposition through pounding in a mortar. When recently making some experiments on the lines of Carey Lea's observations on the effect of mechanical pressure or friction on the silver haloids, the idea struck him that it might be possible to form these haloid compounds mechanically by pounding silver nitrate and the alkaline halogens in a mortar, and, finding that Becquerel had stated that the iodide of lead could be formed in this way, he had tried the experiment with the three haloid salts of silver referred to, using mixtures of silver nitrate with common salt and potassium iodide and bromide. He also showed some silver chloride which had been darkened by continued pounding in a glass mortar, and stated that, although this specimen was not very dark, he had succeeded in getting a strong reddish chocolate colour on the sides of the mortar and the end of the pestle. Colonel Waterhouse read a note in which he gave details of his experiments, and referred to the observations of Carey Lea and Becquerel upon the subject.

#### COMING EVENTS.

May 9, Ordinary Meeting. "Photography of Colours," by Mr. Sanger Shepherd. May 16, Photo-mechanical Meeting, subject to be announced. May 23, Technical Meeting, "Korea," Mrs. Isabella Bishop.

#### PHOTOGRAPHIC CLUB.

APRIL 19.—Mr. H. Snowden Ward in the chair.

Mr. F. H. EVANS gave a lantern lecture on "Gloucester Cathedral," illustrated with a collection of slides, the excellent character of which almost exhausted the powers to praise of a large and appreciative audience. Mr. Evans prefaced his exhibition with some well-chosen words on the several types of architecture to be found in this and other English cathedrals, and then proceeded with such a systematic representation of the beautiful features comprised within the walls of Gloucester Cathedral that, spacious as it is in fact, in fancy one conjured up an edifice of far greater proportions. Particular interest attached to the display on account of the impending visit of the Photographic Convention to Gloucester early in July, when Mr. W. Crooke, of Edinburgh, presides, and the Mayor will open the proceedings for which the Guildhall has been courteously granted.

Mr. BRIDGE, the Hon. Secretary of the P.C.U.K., in moving a vote of thanks to Mr. Evans, referred to the slides as a specimen of what was to be found in and around the Convention's next meeting place, and, though he rather thought that

Mr. Evans had left little unphotographed, yet, from what he knew of the untiring energy of Conventioneers—they suffered very greatly from this species of disease—he had little doubt that they would not return without something new as the result of their endeavours.

**Croydon Microscopical and Natural History Club (Photographic Section).**—On Friday evening last Mr. GEORGE SCAMMELL came down to Croydon in order to lay before the members of this Club the work proposed to be carried out by the National Photographic Record Association. It was suggested that a number of centres should be formed, and societies working around such centres should take up the work, and thus avoid as far as possible the duplication of result. A map was shown, indicating how this was to be done. Everything ought to be done by scale, and Mr. Scammell showed a printed scale marked in yards and metres with their subdivisions, which could be included in the photograph. A mount, too, was shown, to take four quarter-plate or two half-plate prints, cut out and sunk to protect the prints, which could be obtained for half-a-crown a dozen. The prints themselves must be absolutely permanent, obviously, and therefore only carbon or platinum prints would be accepted, bromide or P.O.P. being excluded. It is needless to say that Mr. Scammell handled his subject in a most pleasing and lucid manner, the pity being that the weather was as bad as bad could be, and prevented the attendance which would otherwise have been present and which the subject deserved. Some seventy slides followed, showing the class of work which has so far been accomplished. At the conclusion, the CHAIRMAN (Mr. W. Merton Holmes) proposed a cordial vote of thanks, which was carried enthusiastically.

**Lewisham Camera Club.**—April 18, Mr. M. Stodart opened a discussion on

#### LENSES.

describing the defects inherent in the older types, but which were entirely absent in modern lenses, owing to the invention of Jena glass, the method of manufacturing which he described. As a result of the discussion it seemed to be the opinion amongst the majority of the members that, except for rapid work, no distinct advantage was derived from the use of the newer lenses, as they required stopping down in order to obtain depth of focus, and the production of a sharp image over a considerable angle was not always essential in landscape work.

**North Middlesex Photographic Society.**—April 17, Instruction Meeting, Mr. E. R. Mattocks in the chair.—Mr. Child Bayley showed a couple of lantern slides, which he had exposed twenty or thirty times the correct time, and fixed and then developed with Wellington's sulphocyanide intensifier. They were as clear and dense as one could wish, and of good colour. Mr. H. W. BENNETT, F.R.P.S., gave a lecture on

#### DEVELOPERS AND THEIR MODIFICATION.

In his preliminary remarks he said that it was false that amidol and other newer developers allowed curtailment of exposure, and instanced two examples in which the exposure had been very short; one was developed with amidol and the other with pyro and ammonia. The result was in favour, if any, of the pyro-developed one. He gave a formula for a standard pyro developer, that is, for correct exposures: 1. Pyro, 1 ounce; nitric acid, 10 minims; water, to 9½ ounces. 2. Pyro, 1 ounce; metabisulphite of potash, 1 ounce; water, to 9½ ounces. 3. Pyro, 1 ounce; sulphite of soda, 4 ounces; citric acid, ¼ ounce; water, to 9½ ounces, made up with distilled water and filtered. The one he generally used was No. 2. To make up for use take pyro, 30 minims of ten per cent. solution as above; ammonium bromide, 15 minims; ammonia, 30 minims (also ten per cent. solutions); make up to 2 ounces with water. If No. 2 pyro is used, take 40 minims ammonia, as the metabisulphite is strongly acid. The temperature of the developer should be about 65° F. If it is much colder, development is prolonged, and a vigorous negative is impossible. The time of development for most plates was from four to seven minutes. He showed three negatives developed for three, six, and twelve minutes with this developer, the same exposure to each. The one developed for six minutes was of the best printing density. It was inexpedient to curtail the time of development if a softer result was desired, as the shadow detail suffered. The developer may be diluted to 8 ounces instead of 2, as in the standard. He showed two examples, one with the standard developer and the other the diluted; in the latter the gradations were in a smaller compass. The time of development was prolonged to fifteen minutes instead of six. Fresh developer should be used for each plate, whatever its composition. He gave two formulae for modifying development: 1. Pyro, 30 minims; ammonium bromide, 5 minims; ammonia, 50 minims. 2. Pyro, 30 minims; ammonium bromide, 40 minims; ammonia, 30 minims, each in 2 ounces of water. He showed examples, normally exposed, treated with these modifications; the time of development with No. 1 was two and a half minutes, with No. 2 twenty minutes. In using an excess of ammonia, as in No. 1, the surface of the plate often showed iridescent markings; these could be quite got rid of by immersing for a few moments in a weak solution of Howard Farmer's reducer. The lecturer then treated of amidol, and gave three formulae: 1. Amidol, 2 grains; sodium sulphite, 10 grains; potassium bromide, 1 grain; water, 2 ounces. 2. Amidol, 2 grains; sodium sulphite, 20 grains; potassium bromide, 1 grain; water, 2 ounces. 3. Amidol, 2 grains; sodium sulphite, 40 grains; potassium bromide, 3 grains; water, 2 ounces. He showed examples of normal exposures developed in these solutions. No. 3 most nearly approached standard pyro developer in the result. They were all developed in six or seven minutes. A plate given two-fifths normal exposure was developed in a solution of pyro, ¾ grains; ammonium bromide, ¾ grain; ammonia, 1½ minims; to water, 2 ounces; and developed for twenty-five minutes. Also one three times normal exposure in a solution of pyro, 3 grains; bromide, 4 grains; ammonia, 3 grains; to water, 2 ounces. The results were shown, and were good, printable negatives, but not up to normal exposure of standard developer. The lecturer said that a practical application of the foregoing was to treat subjects having harsh contrasts with a developer suited to under-exposure, and subjects lacking in con-



trast with one suited to over-exposure. Mr. MacINTOSH, in moving a vote of thanks to Mr. Bennett for his very lucid and practical lecture, queried the advisability of filtering the pyro solution in view of its easily oxidisable nature.

**Preston Scientific Society (Photographic Section),** April 19, Annual General Meeting.—Mr. J. H. Yonge was re-elected Chairman, and M. A. W. Cooper Hon. Secretary. Messrs. G. D. Marsden, G. C. Isles, W. Phillips, Hy. P. Burton, W. Crossdale, and Dr. Sellars were elected as Committee.

**Glasgow Photographic Association.**—At the Fifth General Meeting of the session, held within the Philosophical Society's rooms, Glasgow, Mr. J. Craig Annan (Vice-President) in the chair, Messrs. A. Herbert Brown, George S. Nicol, Charles Raeburn, and John H. Tenby were elected members. The meeting approved of the resolution of the Council to join the other local societies in approaching the executive of the 1901 Exhibition, with a view to obtaining for visitors the privilege of using hand cameras in the grounds of the Exhibition. In the course of the CHAIRMAN'S "Notes on the Journals," amongst others, the subjects of "Sacred Art and the Camera," "The Use of Artificial Light combined with Daylight," "Flower Photography," and "Zone-plate Telescopes and Cameras" were noticed and discussed. Mr. Thomas Manly's new process of "Ozotype with Carbon Tissues" was explained, and the Chairman exhibited results of his experiments in the process. Mr. FRED. MACKENZIE described and demonstrated a new method of exposing plates in the camera, by which, with one specially designed dark slide of the usual dimensions, and paper or other envelopes, plates can be exposed and changed in daylight. Mr. WILLIE ANDERSON gave a demonstration of a new method of vignetting, and exhibited and explained his apparatus. Several very successful prints were made, developed, and exhibited. Mr. A. LINDSAY MILLER favourably criticised the new processes, and moved a vote of thanks to Messrs. Annan, Mackenzie, and Anderson.

### FORTHCOMING EXHIBITION.

1899.

April 28-May 13 ..... National Trades and Industrial Exhibition, Bingley Hall, Birmingham. Manager, Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.

## Patent News.

THE following applications for Patents were made between April 10 and April 15, 1899:—

**ADJUSTABLE FOCUSSEING SCREEN AND DARK SLIDE.**—No. 7535. "Focussing Screen and Dark Slide, with Carriages for taking up the varying dimensions of Photographic Plates and Fastening Shutters." W. HARRISON.

**DEVELOPING TRAYS.**—No. 7611. "Improvements in Photographic Developing Trays." A. B. SHEPPARD and J. P. LEECH.

**STEREOSCOPE.**—No. 7655. "Improvements in Automatic Apparatus for Successively Presenting to View Photographic Pictures or Slide in Stereoscopes, Optical Lanterns, and the like." L. J. E. COLARDEAU and J. RICHARD.

**PLATE CARRIERS.**—No. 7751. "Improvements in and relating to Means for Carrying and Exposing in the Camera Photographic Dry Plates or Films." F. MACKENZIE and G. WISHART.

**CINEMATOGRAPH CAMERAS.**—No. 7881. "Improvements in or relating to Cinematograph Cameras." H. G. SAGROVE and J. HALL-WRIGHT.

**SHUTTERS.**—No. 7970. "Improvements in or relating to Photographic Shutters." Complete specification. W. O. STANLEY.

## Correspondence.

\* \* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### ANOTHER SECRET PROCESS.

To the EDITORS.

GENTLEMEN.—A man has recently called on me, and other photographers in the district, offering for sale a secret (?) process for the production of bas-relief in portraiture, &c., and showing specimens said to be produced by his process, which appeared exactly similar to those produced by the Tarber method. The man offered to impart a knowledge of his process for two guineas, and said he could explain all that was necessary in ten minutes. He subsequently reduced his fee, as a special favour, to one guinea; and, in the case of another photographer near here, to half a guinea. He claimed to have instructed Messrs. Gunn & Stuart (Richmond), besides Hills & Saunders, Mayall, and a goodly selection of well-known firms, and said that the work they showed in bas-relief was produced by his method. Some of his statements were contradictory, and his claim to know all the good photographers in Brighton (which statement I was able to test) proved incorrect. We did

not transact any business with him, and I thought it desirable to write you on the matter to strengthen any information you may already have. You may make any use of this letter, and retain the circular at your discretion.—I am, yours, &c.,

East Molesey, April 25, 1899.

JOHN G. WILLIAMS.

P.S.—The man wrote his town address on back of circular in pencil, but could not supply us with his card, or other printed matter.

[In our ALMANAC for 1898 will be found several processes of bas-relief photography. It is very old, and was known and exploited many years ago.—EDS.]

### THE TANQUERAY PORTRAIT SCHEME.

To the EDITORS.

GENTLEMEN.—There are many unpleasant things that business men come across that it is not always wise to give vent to through the public press, and I am not sure if so much attention given to the "Tanqueray free portraits" does not give the two Americans running that show a good advertisement. Still, on the whole, I think with you, gentlemen, that more light should be thrown upon this subject, hence this letter. I have had recently two of these so-called portraits brought to me to re-work, and hear of a third coming, and quite a dozen customers have referred to the matter during the past six weeks; it is therefore evident that this neighbourhood has been widely circularised.

During several trips to Paris in the past few years I have had a good opportunity of watching Tanqueray's progress. I have seen both his old and small establishment in the Rue des Italiens, and also his present large premises in the Rue de St. Pétersbourg, and there is every evidence that he has made a lot of money out of his scheme. I have before me one of his portraits, and on careful examination I should judge it to be made by the American solar process, there is no trace of gelatine on surface of paper, it looks like an eighty-five gramme Steinbach paper salted, and sensitised with nitrate of silver.

These prints in America are sold to the trade (and they are largely used over there) for five cents each (2½d.), the actual cost to Tanqueray would be about 1½d. The thin mount would cost ¾d. and the air-brush artist would not get more than 9d. or 10d. for his work in an American portrait house. The only postage stamp a portrait recently brought to me was one of fifty centimes, so that the eight francs or eight shillings (most usual) paid for "mailing" leaves Tanqueray a profit of over four hundred per cent. The formula by which this paper is sensitised was offered me by an American for three hundred pounds, another one over here, some four years ago asked five hundred pounds for it, it did not cost me anything.

Enclosed I send you a circular and testimonials from Tanqueray in the Rue de St. Pétersbourg, Paris, also one from his brother-in-law, Schneider, around the corner, in the Rue de Constantinople.

Sometimes this individual has acted as Directeur in place of Tanqueray at the other address, but you will notice that both Schneider and Tanqueray, carrying on distinct businesses in different streets, use the same testimonials, as if addressed to each house individually. It would be interesting also if the public were acquainted with Tanqueray's doings in America and Canada, but I have written for only about what is within my own knowledge.—I am, yours, &c.,

FRANK A. VENNING.

Crayon Limited, 49, Brecknock-road, London, N., April 19, 1899.

### PHOTOGRAPHY AT FUNERALS.

To the EDITORS.

GENTLEMEN.—To my mind, I think there is nothing so utterly obnoxious, as for any one "shopping" on such an occasion; surely the poignant sorrow of the true mourners might be respected, if not the feelings of the general public! But talk about consideration for others, I was completely non-plussed, when some thirty years ago, while taking a photograph of a country church, the clergyman suggested my taking a "photograph of a funeral that was just about to take place—with himself officiating in his white surplice"—and, mind you, not a junior clergyman by any means; suffice it to say, young enthusiast as I was, I nevertheless declined! I hope my brother photographers will exercise a little of the same consideration, and never again be charged with so despicable an act as to attempt to make capital out of such painful circumstances, but—

"DO AS YOU WOULD BE DONE BY."

### A SOCIETY FOR PHOTOGRAPHIC PRINTERS.

To the EDITORS.

GENTLEMEN.—I was much interested in the letter of Mr. F. G. Willatt on the above topic, and fully agree with his desire to more accurately classify the various photographic assistants. I would point out, however, that our trade is a mere infant when compared with carpentry, plumbing, and bricklaying, and, consequently, the distinctions between its various members have not yet reached so definite and fixed a boundary as those between the members of the building trade. Such a clear line of duties as now falls to the carpenter and plumber has only been attained by



years of experience, aided largely by trade-union action. The result is an effect of trade unionism, and a similar condition will prevail in photography so soon as assistants become trade unionists. The difference is merely that between the organized and unorganized.

The want of knowledge concerning trade unionism displayed by the average assistant is well put by Mr. Willatt. "I must be free to take what wage I please," says the assistant, assuming wrongly that trade unionism destroys such a liberty. The trade unionist is much less heroic; he considers wages from a businesslike point of view. In plain language, he tells the "free and independent" that, if 25s. is the general rate of wages for operators, artists, retouchers, printers, the only liberty he enjoys is to accept 20s. or 15s., he not being in a position to do otherwise, since the employer has money and the "free and independent" is penniless. This being so, a trade union undertakes to supply cash, every member paying money down to receive money value in return—a purely commercial transaction for services rendered, the result being that a trade unionist is not compelled to accept 20s. or 15s., but can demand 25s., the full market value of his labour. There are trade unionists to-day who, by the payment of sixpence, or even less weekly, keep up their wages 2s., 3s., 5s., or even 10s. or 11. a week, and with increasing organization the rate of wages will continually rise.

With Mr. Willatt's suggestion that photographic printers should form a union I do not agree. The spirit of the times is entirely against such a course of action. "Fewer unions and more union" is now the motto of the labour world, and every trade-union leader is striving to federate or amalgamate the smaller unions. The last engineers' strike has entirely changed the trade-union outlook, and in the future trade unionism must deal with men by the 100,000 if it is to cope with federated capitalists. The proper policy, in my opinion, is for photographic assistants to join the National Amalgamated Union, particulars of which were given in the JOURNAL of last week.—I am, yours, &c.

JOHN A. RANDALL.

April 21, 1899.

## PINHOLE PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—There has been quite a fuss made of late about photographs being taken by means of a box with a little pinhole. I should like to state that this is no new invention, as I have had such a box in my possession for years, and have only to-day exposed a quarter-plate with splendid results, the negative being perfectly sharp and fully exposed.—I am, yours, &c.,

G. FROST.

West-end Studio, Alton, Hants, April 21, 1899.

[Quite so: pinhole photography is not a "new invention." Indeed the principle of passing an image through a minute aperture may at least be traced back to Sir Isaac Newton.—EDS.]

## IN REPLY TO "FREE LANCE."

To the EDITORS.

GENTLEMEN,—Will "Free Lance" show that a point moving half an inch in  $\frac{1}{100}$  second, must necessarily be represented by a line? Will he also show that every part of a horse in gallop moves at uniform velocity?—I am, yours, &c.,

P. EVERITT.

London, April 22, 1899.

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

O. BURTON and J. W. BURTON, Haymarket, Leicester.—Three photographs of Tom Frost.

T. M. BARBOUR, 1, Briarley-street, Bury, Lancs.—Photograph of group of the Bury Football Team with the Lancashire cup.

A. B. LEZARD, Sunningdale, Boxley, Kent.—Photograph of ss. "Stella," with Elizabeth Castle, Jersey, in background.

WILLIAMS & Co., The Studio, Castle-street, Maesteg, Glam.—Photograph of Dr. W. H. Thomas, J.P., M.D., M.R.C.S., L.R.C.P., Maesteg, Glamorganshire.

RECEIVED.—METOL; J. H. C.; F. BROWN; C. GORHAM; R. PRYOR; H. J. HILLHOUSE; and others. In our next.

R. A. FREEMAN.—The paper is not now obtainable commercially.

A. WINTER.—We should not expect to find any loss of definition through the cause assigned.

S.—If your order comes from H.M. Office of Works, we believe it covers Hampton Court Park.

J. B. (Plymouth).—The negatives are your property, and you cannot be compelled to part with them.

W. T. W. S. (Uppingham).—We are very much obliged to you for your letter and enclosure. It is a very painful case; but we prefer to withhold from publication.

CALIFORNIAN.—We do not give recommendations of the nature of that asked for. Better look through the advertisements in our ALMANAC and study the details of the various matter therein given.

RESTORING DAGUERRETYPES.—Messrs. G. and J. Hall, of 9, Westgate, Wakefield write: "If 'C. B.' will send Daguerreotype to us with 2s. 6d., we will either restore it or, if too far gone, return the money less postage."

COPYRIGHT.—1. Yes; the respective assignments would embrace the total length of the term of copyright. 2. In both originals and reproductions. 3. Yes. 4. No; but they may have copyright in photographs of the pictures. 5. Not to America.

THE TELESCOPIC.—G. NAG says: "I have read with great interest your articles about Szczepanik's Telescoposcope in the THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1899. As I am desirous of possessing one of these marvellous instruments, I shall trouble you to let me know where a telescoposcope can be had, and at what price?"—In reply: The instrument referred to is not on the market, and we doubt if it is likely to be yet a while.

CRYSTOLEUM.—B. & S. say: "Can you kindly inform us of any method whereby ordinary gelatine-surfaced paper can be rendered transparent for crystoleum work?"—The only means we can suggest are those used for albumen prints, such as wax, castor oil, paraffin wax, &c. It is a little doubtful if any of them will render the prints so transparent as they would albumen ones by reason of the baryta coating with which the paper itself is coated.

PREVENTING UNMOUNTED PRINTS CURLING.—G. DAVIES says: "Can you inform me of a method to prevent unmounted silver prints curling when dry? I notice that views, &c., published abroad show no tendency to do so. Can you oblige me with the reason?"—The prints referred to are usually kept flat while drying—i.e., drying between blotting-boards under pressure, and then heavily rolling on a steel plate. If the prints are squeezed on talced glass, and allowed to dry on that, they will have little tendency to curl afterwards.

UNDER-TIMED NEGATIVES.—R. BEST sends a couple of negatives as a sample of what he took on a recent Continental trip, and says he has "about a gross more plates to develop, but they have all had about the same exposure. With what have been developed pyro ammonia was used and the development much forced, which has caused staining."—The plates are much under-exposed. We should recommend the metol-hydroquinone developer, as given in the ALMANAC, to be tried, using it somewhat diluted, and with plenty of patience.

COPYRIGHT.—Z. Z. Z. says: "I have to-day had brought me a 12×10 to reduce to half-plate. It has not so much as the name of the photographer on it, but I find in your issue of to-day that it is registered. The members of the band have paid for a 12×10 copy each; some of them wish me to produce a half-plate size to send to their friends, agreeing to take a certain number. Can I do it?"—In reply: No; not if the person registering the photograph was not paid for it. The copyright is his. We have had no previous query from you.

WORKING UP PLATINOTYPES.—BLACK AND WHITE says: "Could you advise me the best way of touching up platinotypes—what materials to use, &c.? Are there any handbooks published on the subject?"—Only the ordinary water colours, such as are used for other photographs, are necessary, such as Indian ink or ivory black modified with a little blue. There is no work specially devoted to working up platinotypes published. They are treated just the same as any other kind of photograph, and the paper is better to work upon than most others.

DRYING PRINTS. ACTINOMETER.—ACTINOMETER says: "Could you kindly reply to the following questions? 1. A few days ago I dried some prints (P.O.P.) with methylated spirit, and there did not seem to be any harm resulting, but perhaps some bad effect may show itself afterwards; so, does it injure prints of any sort to be dried with methylated spirit? 2. I am thinking about getting an actinometer, but I believe the actinometer has to be exposed for a much longer time than the plate; and, as a plate sometimes requires an exposure of a quarter of an hour in interiors, it seems to me that the actinometer would have to be exposed for a very long time indeed, some hours perhaps."—1. If good methylated spirit be used, no harm will result, but we should advise it to be free from the mineral spirit. 2. Directions are supplied with the different actinometers to meet such cases as those referred to. Get prospectuses of them from those who supply them.

LENS QUERY.—PORTRAIT LENS says: "Would you kindly say if you know Janin, Paris, lens-maker? I have an offer of a portrait lens, five inches diameter; it has a rack for focussing and another rack to separate the back and front lenses near and distant; is it the same principle as Dallmeyer has on his B lenses? Would it, do you think, be useful for large heads? It has no stops. What I really do not understand is the second rack for separating lenses. Thanking you in anticipation."—In reply: The lens is a very old one, as that form is not made now. The object of separating the lenses is to alter the equivalent focus and, at the same time, to an extent flatten the field, but only at the expense of astigmatism. It will, we expect, be found to work at its best with the components in their normal position. The lens is not constructed on the same principle, for diffusing of focus, as the Dallmeyer patent lenses. If the lens be of long focus, we should say it would probably do for large heads.



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## EX CATHEDRÂ.

THE ballot paper for the election of Judges to act at the next Exhibition of the Royal Photographic Society has just been issued. It contains the names of twenty-five gentlemen who are standing for the Pictorial Section, and nine for the Technical. Here is a complete list of candidates with the number of nominations they have received. Pictorial Section: B. Alferi (1), J. Craig Annan (5), Harold Baker (15), H. Walker Barnett (1), F. P. Cembrano (1), R. W. Craigie (1), W. Croke (1), Dr. P. H. Emerson (13), T. Fall (1), L. Fildes, R.A. (1), Colonel Gale (13), J. H. Gear (4), A. Horsley Hinton (14), J. A. Hodges (3), F. Hollyer (5), Charles Job (1), B. W. Leader, R.A. (3), Sir J. D. Linton (3), H. P. Robinson (6), J. A. Sinclair (4), G. A. Storey, A.R.A. (4), W. Thomas (2), G. E. Thompson (1), J. B. B. Wellington (15), W. L. Wyllie, A.R.A. (12).

IN the Technical and Scientific Sections the gentlemen nominated are: Captain Abney (17), T. Bolas (13), J. Bulbeck (1), Chapman Jones (18), J. W. Swan (1), J. J. Vesey (1), L. Warnerke (1), Colonel Waterhouse (1), Sir H. T. Wood (1).

In recent years no such list of nominees, containing, as this does, the names of some of the most prominent photographers of the time, has been issued by the Society, and for bringing about such a gratifying result we have the satisfaction of knowing that the prime cause at work was the attention we directed to the matter three weeks ago. We shall have more to say on the subject in future issues.

\* \* \*

It may be as well to remind members of the Society that the ballot paper is contained in the April number of the *Journal* which was issued on Wednesday. Special attention is directed to the condition that the ballot papers must be sealed in a plain envelope bearing no inscription whatever, and that the envelope in its turn must be enclosed and sealed in one which must bear upon its outside the words, "Ballot paper," and the signature of the member voting, and must be addressed to the Secretary, Royal Photographic Society, 12, Hanover-square, London, W., and posted to reach that address on or before Wednesday, May 31, at noon. Any ballot paper arriving after the time and date named or in a manner not conforming to the above regulations will be disqualified. Care should be taken that the ballot paper when returned bears not more than five names for the Pictorial Section and three names for the Technical and Scientific Sections.

\* \* \*

READERS OF THE BRITISH JOURNAL OF PHOTOGRAPHY all the world over will, we are sure, learn with regret of the very dangerous illness of Mr. W. B. Bolton. For many months past he has been bravely fighting the battle against the most terrible of all diseases by which a human being can be attacked—cancer—and at the present moment he lies prostrate and helpless. A wish for Mr. Bolton's recovery will rise in the minds of thousands who read these lines. His is a name that has been written across the pages of photographic history in indelible ink. It is nearly thirty-five years since the publication of the collodion emulsion process associated with the names of Sayce and Bolton. For the greater part of that long space of time Bolton's writings have had a conspicuous place in THE BRITISH JOURNAL OF PHOTOGRAPHY, of which, during the years 1879–1885, he was the Editor-in-Chief,



in which capacity his work oftentimes was of the most brilliant kind.

\* \* \*

IN the early eighties, the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY were most eagerly scanned for what they contained relative to the details of the then comparatively new gelatine dry-plate process, with which, as an experimentalist, Bolton's name was perhaps more intimately associated than any other. It is hardly an exaggeration to say that the industry of gelatine dry-plate manufacture owes more to the experimental efforts of Bolton on the subject of the correct principles of emulsification than to any other man. But, indeed, there is scarcely a branch of photographic chemistry of which Bolton has failed to say something luminous, informative, and suggestive. Fortune has showered great gifts on many less deserving than Bolton, upon whose very grave illness we ourselves, who have seen the best that is in him for twenty years past, can only think with the greatest pain.

\* \* \*

THE Invitation Pictorial Section of the International Photographic Exhibition, comprising about a hundred photographs sent by forty or more British exhibitors, has, we learn, excited the very greatest interest and admiration among the Italian photographers who have seen the display. A debt of gratitude is owing to Mr. Henry E. Davis for having been instrumental in organizing the section, which has taught Italian photographers that British pictorial photography has reached a stage of beauty and variety of expression far higher than what has been attained by photographers elsewhere. In particular, we are given to understand, Italian admiration has been excited by the mastery over the various printing processes shown by British photographers.

\* \* \*

BESIDES holding its Annual Dinner on Thursday in this week, the members of the Camera Club entertained their lady friends with a lantern-slide evening on Wednesday last. The annual exhibition of members' work is now on view in the Club-room. Of its kind it is, perhaps, as good an exhibition as the room has seen. Mr. W. Crooke sends a charming full-length study of a little boy, and the refined and delicate art of Mr. H. Walter Barnett is shown in four portraits, one of which, with its conscientiously studied effects of lighting and pose, it is difficult to imagine was produced by photography. Contributions come from Mr. George Davison, Mr. Henry Stevens, and other able workers, and altogether the Exhibition is a pretty and pleasant one. Two of the most conspicuously hung portraits are, however, excellent examples of what to avoid in vignetting, and deserve to be seen on that account.

\* \* \*

WE hear upon the best authority of the discovery of a new transparent substance which is claimed to possess properties suiting it for the manufacture of photographic films and other articles. The new substance is named Flexoid. It is textureless, flexible, does not expand, contract, or buckle when wet, is not acted upon by the ordinary photographic developing and other solutions, but lies perfectly flat and limp during these processes, and dries without curling. Flexoid is applicable to most of the purposes to which celluloid, xylonite, and similar compounds have hitherto been used. It can be moulded,

pressed, turned, or otherwise treated. It is stated to be free from gun-cotton, camphor, gelatine, or collodion. It cannot ignite spontaneously in the lantern, and hence should solve the long-desired solution of a fireproof film for cinematographs.

\* \* \*

THERE will be no Paris Photographic Salon this year. The galleries in which the Photo-Club de Paris have hitherto held the Exhibition are not available this summer, and efforts to find suitable premises elsewhere have been unsuccessful. In these circumstances the Committee of the Club notify that the next Exhibition of the Paris Salon will not be held until the year 1901, the great Exposition of 1900, of course, blocking the way of an Exhibition next year. We are not confident of the survival of the "photographic Salon" idea for three years without the stimulating fillip of an exhibition, and this both at home and abroad. However, the news we have given will be interesting to English exhibitors, who will know that they need not trouble to prepare anything for the Paris Salon for a couple of years.

\* \* \*

THE Assistant Secretary of the Royal Photographic Society asks us to remind the members of the Society that the next sitting of the Fellowship Admissions Committee will be held on Monday, May 8, and that all applications for consideration at that meeting should be in his hands by that date.

\* \* \*

MAY-DAY brought us from the office of the *Art Journal*, 26, Ivy-lane, E.C., the familiar annual, *Pictures of 1899*, which consists of reproductions of many of the pictures hung at the Royal Academy and other exhibitions. The volume should be found useful for reference by those interested in the year's art, and many a photographer might find it advantageous to purchase it for the purpose of informing himself of some of the latest phases of painting and sculpture. It is noteworthy that this year our splendid contemporary, the *Art Journal*, completes the fiftieth year of its existence. A special Jubilee reissue of the publication in twelve monthly parts is announced.

\* \* \*

FOR the Gleeson-White Fund, to which we made reference a fortnight ago, Mr. H. Walter Barnett sends us a cheque for 17. 1s. We shall be happy to receive further contributions to the fund and forward them to the proper quarter.

\* \* \*

WITH reference to our last week's remarks on the imminent removal of the Royal Photographic Society to its new premises at No. 66, Russell-square, a happy suggestion has been made to us that the occasion should be signalised by some little inaugural function in the nature of a housewarming. For the first time in its history, it takes possession of a worthy and permanent home, and it is felt that an event of such interest and importance deserves a little celebratory notice. It is put to us that if the President, Lord Crawford, and the Council were "at home" one evening to the general body of members, a large number of them would be present for the purpose of viewing the new premises. Possibly music and light refreshments could be provided, and the occasion thus be made a pleasant little function. These suggestions may be worth the notice of the Council.



## THE PROJECTED COPYRIGHT ACT.

IN the House of Lords, on Friday last, the new Copyright (Artistic) Bill, to which we made allusion in our previous issue, was read a second time, and then referred to a Select Committee. Lord Monckswell, its promoter, in moving its second reading, referred to some of the differences between the proposed Act and the present one, and made a point of the fact that it had the warmest support of the Royal Academy. It will be remembered that a new Copyright Bill was introduced in the Lords last session, but it came to nothing; so indeed had several others that had been projected in previous years. Strong comments have from time to time been made that these Bills have all been framed more in the interests of painters than in those of photographers, and therefore the latter should watch their particular interests in the matter.

As the new Bill has now been printed and issued, it will be well to point out its most salient features as affecting photography, and compare them with those existing in the present Act. The Bill is entitled, "An Act to simplify and amend the Law relating to Copyright in Artistic Works," and, if it passes, is to take effect on the first day of 1900. In the Bill a distinction is made between works of fine art and photographs. This may possibly wound the *amour propre* of some of the "Salonistic" school, though it must be admitted that recent exhibitions have failed to establish a claim to photography being a fine art in the true sense of the term. However, we do not imagine that the majority of professional photographers will care very much about this distinction in the Bill; what most concerns them on this point is the duration of the copyright in their works.

In the Act of 1862—the existing Act—photographs and paintings are dealt with alike. In both cases the copyright endures for the life of the author, and for seven years after his death. In the proposed Act copyright is dealt with in three classes. The first is "works of fine art," which comprise paintings, drawings, engravings, sculpture, and other artistic works; the second, photographs; and the third, casts from nature. In the first class the copyright is for the life of the artist and for thirty years after his death. Here is a decided prolongation of the copyright. In classes 2 and 3 it is for a period of thirty years from the first day of the month of registration. This seems a little vague when taken with subsequent clauses. The duration in these classes may be a longer or a shorter term than at present, according to the life of the author. If he dies shortly after the production of the work, it would be longer; but, if he died thirty or more years after, it would, of course, be shorter. Any how, it is to be for the definite period of thirty years, neither more nor less. We opine that the value of copyright in the majority of photographs is not very great after the lapse of thirty years, though it is different with paintings.

Registration, it seems, is not necessary by the author, the copyright being his sole property; but registration is compulsory where the copyright is assigned to another, and the assignment must be in writing. The registration in this case must be effected within six months of the assignment, or the copyright becomes null and void. An important point in the present Act is that the copyright is vested in the author, and it was decided, in the celebrated case of *Nottage v. Jackson*, that the author was the one who actually took the photograph, even though he were an *employee*. In the new Bill it is provided that, when any person employs another for a valuable

consideration to make any photograph, or assists in making one, the copyright is to belong to the employer as if he were the author of the photograph.

In the case of portraits taken for a valuable consideration—though what is a valuable consideration is not specially defined—the copyright is still vested in the author, but he is not entitled to make any copy thereof, or sell, distribute, let on hire, or exhibit such work without the consent in writing of the owner of such portrait. The owner is to have all the rights of an owner of copyright to prevent infringements and to obtain the seizure of copies dealt with; and it will not be necessary, in order to enforce such rights, that the portrait be registered.

With regard to infringements, the infringers will be liable to an action for an injunction to restrain and for damages, and an account of all copies sold, as at present. The penalties will, however, be heavier than now. At present it is limited to ten pounds for each copy, but, according to the new Bill, it is to be twenty pounds and twice the sum for which each copy was sold, and, in addition to this, the taxed costs as between solicitor and client; also all the negatives, plates, &c., are to be forfeited and destroyed, as at present. Any court of summary jurisdiction is to have the power to grant warrants to search any house, shop, or place—on sufficient ground for it being shown—and make seizure of any infringements if found; also any constable will be empowered to seize, on a request in writing from the owner of the copyright or his agent, any pirated works in the possession of hawkers. For fraudulently affixing any person's name to a work of fine art or photograph, who did not produce it, with the intention to defraud, the punishment is to be very severe—imprisonment not exceeding six months, and forfeiture to the person aggrieved a sum not exceeding one hundred pounds. In the supplementary conditions and definitions of the Bill, the expression, "photograph" is to include negatives or positives and any copies made therefrom.

The expression of copy is important and well defined, and we here quote it in full. "The expression 'copy' shall, subject to the provisions of this Act, mean any representation or reproduction of a work, or any part thereof, or the design thereof, in the same or any other form, and in any material and any size, and shall include a reproduction of a picture by a sculpture, or a sculpture by any other work of art, and a representation of a picture or sculpture by a living picture." In the memorandum to the Bill the case of *Hanfstaeigl v. the Empire Palace* is specially cited. Had this Bill been law a few years ago, thousands of pounds would have been saved in litigating this case.

In the above we have simply referred to the more important points of the proposed Act as it stands as affecting photography, and withhold any criticism upon it for the present. The Bill may, of course, be very materially altered, amended, and modified before it passes into law, if it does do so. As we have said, the Bill is printed, and may be had at the Queen's printers—Eyre and Spottiswoode's—for the small sum of 2½d., and those interested in the subject will do well to get it.

**On Varying Qualities of Limes.**—The well-known varieties of effects brought about by the use of different kinds of limes for the oxyhydrogen light in lantern work seem capable of being increased by the addition of another important variety. M. Henri Gautier described the thermal effects obtainable by limes prepared in the electric furnace. Naturally the extent to which the



electric action was permitted could be varied or arrested to any extent, and so possibly a valuable new lantern adjunct produced. Working with the furnace at its best, M. Gautier obtained pieces that were so slowly acted upon by water that their specific gravity could be taken in that liquid.

**New Actinic Photometer.**—At the same meeting of the Paris Academy of Sciences to which M. Gautier described his lime experiments M. Charles Henri gave an account of his new instrument, entitled as above. Its action is founded upon the luminosity of phosphorescent zinc sulphide and the intensity or nature of the exciting sources of light.

**Diffraction of Rontgen Rays.**—Up to a recent date it has been generally held that the X rays could not be, and had not been, diffracted; but Professor Haga, in the name of himself and Dr. C. H. Wind, has shown that diffraction can be produced, as in the following method. The Crookes tube was placed behind a slit 1 cm. high and 14 microns wide; at 75 cm. from the latter was placed the diffraction slit, which gradually diminished in width from 17 to about 2 microns. The dry plate was placed at a distance of 75 cm. from the diffraction slit. The plates were exposed for times varying from 100 to 200 hours. The image of the slit, at first narrower, gradually and unmistakably became broader. From the width of this slit, corresponding to the broadening and the character of the latter, an estimation of the wave-length of the rays can be made. The experimenters found the rays to consist of from 0.1 to 2½ Angström units comprising four octaves.

**The Use of Kites.**—We have several times referred to the position attained of late in the science of kite-flying and its possible adaptability to photographic purposes, and our attention has been again called to the matter by observing in a scientific contemporary a query as to the proper mode of constructing such a kite and the suitable gauge of the pianoforte wire to be used as the "string," the purpose of the inquirer being to send up the kite with a camera attached. Bulletin No. 3 of the Blue Hill Observatory gives an excellent *résumé* of the kind of work done during the last two years. An early record was Mr. D. Archibald's, he in this country having sent up, to a height of 1500 feet, a kite with anemometer attached. Mr. W. Eddy a couple of years later invented a kite which ascended 2000 feet, until at last, in America, the last two years' efforts have culminated in the attainment of a height of 10,000 feet for a kite with self-acting meteorological instruments attached. Last February, they topped the record at 12,507 feet. Kites are cheaper than balloons, and the instruments can be better actuated from them than from the latter. It would therefore appear that there now only needs the advent of a suitable camera with self-exposing apparatus for the photographic method to become an actual success.

**Permanency of Aluminium.**—An opinion prevails that aluminium is not put to the uses it might be in photography, and certainly the advantages it offers, by reason of its extraordinary lightness, are so very great, that it is small wonder, especially as it now is obtainable at such a cheap rate, that opportunities should be sought for further utilising it. One great supposed drawback is its alleged want of permanency. We have been credibly informed that cases are frequent in which it has been known, when exposed to the atmosphere, to "shell away," and we have the record of the French Commission, who examined this question with considerable pains; they gave an adverse verdict. But two points militating against the acceptance of the verdict must be borne in mind. First, the metal is now procurable in a far purer form than at the time the Commission sat, so high, as M. Moissan recently pointed out, at a sitting of the Paris Academy, as 97.8 per cent. against a mean percentage 93.4, which was its record about five years ago. Again, referring to the quick disintegration of drinking vessels used in Madagascar, M.

Moissan points out that this may have been expedited by the utensils having been mounted in iron, and so a galvanic action having been set up; and this, as every one knows, is fatal to metals like aluminium. With regard to the use of this metal for developing dishes and the like, account would have to be taken of its behaviour to chemicals. Thus, concentrated nitric acid will not act upon it; but, contrariwise, it is readily dissolved by hydrochloric acid. It is also readily acted upon by solutions of caustic potash or soda, though not to the same extent as with hydrochloric acid.

### SPEED SCALES.

THERE is a very good opening for a series of articles on the speed scales now in use. I have computed the enclosed comparative table, which is as near as I can get it from the data before me; but such data are not always of a satisfactory nature. The following is a quotation from the *Instructions for the Use of Hurter & Driffield's Actinograph*:—

"The Speed Scale.—The speed of the plates as marked on this scale has no relation to the arbitrary and unreliable speeds generally spoken of, but is based upon scientific principles and upon clearly defined units. We define the speed of a plate as that exposure, expressed in seconds, which, with one actinograph degree of light, will produce a theoretically perfect negative of an ordinary landscape, the light reaching the plate being equal to that reflected by the objects. The marking of packets of plates with their actinograph speed will be a very great boon to photographers, if only because the exposures the plates will require will be exactly proportional to the speed indicated."

The above appears to be very clear and rational, and I understand from it that if a packet of plates marked 10 required one second exposure, another marked 20 required two seconds, and so in proportion; but all this is expressed by the example which is given thus:—

"If, for example, a photographer has worked successfully with some plates of which the actinograph speed was 10, and the next packet he procures is marked 20, he will at once know that the latter requires just half the exposure of the former, because twice as rapid."

EXPOSURE TABLE.

Proportionate length of Exposure.	Hurter & Driffield's Notation.	Watkins' P Number.	Wynne's Meter.
6	166.66	250	f.115
7	143	214	f.106
8	123	188	f.99
9	111.11	166.66	f.94
10	100	150	f.89
20	50	75	f.63
30	33.33	50	f.51
40	25	37.5	f.45
50	20	30.0	f.40
60	16.66	25.0	f.36
70	14.3	21.4	f.34
80	12.5	18.8	f.32
90	11.11	16.66	f.30
100	10	15.00	f.28

This is difficulty No. 1. The scale used in the Watkins meter is clear, and the column of proportionate exposure is calculated to correspond with it.

Returning to the Hurter & Driffield meter, I find, from Mr. Watkins' Relative Speed List, that some firms mark their plates with H. & D. speed numbers, but that the speeds denoted by the same number vary according to the make as 1 to 1½ and 2½ (approximately). This difference, I understand, is due to the developer used in testing the speed. In compiling the table I have taken the value of the H. & D. meters at two-thirds of the Watkins' plate-numbers. The last column is calculated from the H. & D. column in accordance with the data given in Mr. Wynne's List of Plate Speeds.

Ought not this matter to be taken in hand by the Royal Photographic Society, and a uniform system of testing and marking recommended? My own view is that the numbering should be in direct (not reverse) proportion to the exposure required. This has been done in the case of apertures.

CHARLES LOUIS HETT.



## AMMONIUM PERSULPHATE—ITS PROPERTIES AND USES.\*

8. BESIDES a neutral solution, Namias also tested a solution of ammonium persulphate, made alkaline by the addition of ammonia, and found that such a solution acted only very slowly as a reducer, and required an hour and more in order to obtain the same effect which is given by the neutral solution. If a solution of persulphate made alkaline by the addition of ammonia is mixed with a solution of silver nitrate, there will be no precipitate even after a long time, and even after some hours the mixture remains as clear as water. Nevertheless, the alkaline mixture exerts a reducing action on the image which is quite equal to the plain solution, but it requires a longer time.

Whilst the phenomena stated above prove that the explanation given by Lumière and Seyewitz is untenable, they lead to the conclusion that the inferior reducing action on the surface of the image-bearing film (namely, the deposition of the subsulphate of silver) is not the only and the principal action; what the latter is, is at present unknown.

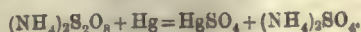
9. Besides the use of ammonium persulphate as a reducer, there are other applications in photography which are not less important.

In the first place it is undoubtedly the best method to reduce yellow stain in negatives, and it is considerably more effective than thiocarbamide, which is so often recommended for this purpose.†

Ammonium persulphate acts quickly on the freshly made and also on the old negatives. Either a one per cent. or, at the most, a two per cent. solution should be allowed to act, and this takes from five to fifteen minutes; the negatives should then be placed at once in a five per cent. solution of sodium sulphite and then washed. The persulphate destroys and removes the substance which forms the yellow stain, and converts any silver in the yellow fog into silver sulphate.

Persistent yellow fog or yellow spots in the negative, caused by the fixing, require a prolonged action of the persulphate, and even if in a weaker solution a reduction of the image will take place. If a solution made alkaline with ammonia be used, there is no reduction during the time necessary to remove the fog.

10. Ammonium persulphate may also be used for the reduction of negatives which have been intensified with mercury, cyanide, which has hitherto been recommended for this purpose, being unsafe. Negatives which have been blackened with sulphite are specially suitable for this purpose. In this case the image consists partly of metallic mercury, which is converted into sulphate according to the following equation:—



12. The property of the persulphate of dissolving the silver of the image may be used for making positives direct in the camera or may be used for the preparation of duplicate negatives with advantage.‡ The negatives, which should be fully exposed, should be treated with a developer with plenty of bromide till the image is plainly visible on the back. It should then be washed and immersed before fixation in a five per cent. solution of persulphate and left till the image has entirely disappeared, which will be in about twenty minutes.

It is advisable to mix the persulphate with some alum solution in order to counteract the solvent action of the former on the gelatine, and for the same reason also the strength of the persulphate should not exceed five per cent.

The film after this contains only the silver bromide not reduced by the developer which corresponds to a positive image. After washing, the plate should be exposed to diffused light for from twenty to thirty seconds and then blackened in the developer. For this second reduction the ordinary negative developer is hardly energetic enough, and therefore Namias adds to every 1000 parts of the ordinary hydroquinone developer at least 10 parts of caustic soda. This method for the production of positives is much simpler than all that have been hitherto recommended; it can, however, give failures as well as those if not properly worked. In order to obtain clean images, the development must, as has already been mentioned, in the high lights be carried on right to the glass.

On the ground of the notable action of the persulphate on the silver image, it was feasible to assume that it would not be without influence on the latent image; and, as a matter of fact, Namias has been able to confirm that an exposed image after a five minutes' treatment with a two per cent. solution of persulphate has entirely lost the power of being

developed. A shorter time of action only weakens the image, so that it is quite possible that use of this property might be made to reduce the action of over-exposure. The few experiments which have been made however, do not allow a definite conclusion on this point.

13. The property of the persulphate of converting the chromous oxide into chromic acid enables one to use it for the development of over-printed bichromated gelatine films in which the ordinary means are of no use. For this purpose a five per cent. solution mixed with one per cent. of sulphuric acid should be allowed to act for half an hour or longer, and then development effected with lukewarm water. The persulphate, in the presence of the sulphuric acid, oxidises and partly dissolves the insoluble chrome gelatine or albumen, so that the same will dissolve more readily in lukewarm water.

Namias believes that ammonium persulphate could also be used for the restoration of spoilt pigment paper, but no results have been made.

14. A very important application of the power of the persulphate to dissolve metals may be made. It has already been mentioned that persulphate will dissolve zinc, converting it into sulphate without the evolution of hydrogen. Experiments have proved that persulphate gives far more even results when used for etching zinc for half-tone work than any acid, and that its action is very like that of ferric chloride.

It was found, however, that there was still a small evolution of gas when the persulphate acted on zinc, even when the solution was made alkaline with ammonia. This latter fact appears to exclude the assumption that the gas that is set free is merely hydrogen caused by the action of the sulphuric acid, which is formed by the spontaneous decomposition of the persulphate, on the zinc.

Perhaps the zinc decomposes part of the persulphate which may not take part in the reaction, so that the persulphate extracts the hydrogen from the water and sets free oxygen, as has been noted elsewhere.

Whatever it is, there is no doubt that an etching solution, which, like ammonium persulphate, acts in a neutral or alcoholic solution, and which causes only a faint evolution of gas, will be very advantageous for the regular process of etching, and probably may make the burning in of the insoluble bichromate film for the protection of the drawing during etching quite superfluous. The bichromate film made insoluble by the action of light alone may prove by itself to be sufficient protection, so that the burning in, which is so prejudicial to the zinc, may be obviated.

Aluminium is attacked in a similar manner as zinc, so that, when this metal is used as a substitute for the litho stone, this etching solution ought to be the most suitable.

Copper is also attacked by ammonium persulphate without the evolution of gas, and the more alkaline it is made the stronger it acts, so that in many cases the persulphate may replace ferric chloride.

15. For positive work on printing-out papers the persulphate is very useful as a reducer. As a neutral solution acts too energetically, Namias uses a one per cent. solution of persulphate to which one per cent. of ammonia is added. The prints may be reduced before or after toning or after fixing. The prints should be well washed, and, if treated after fixing, they should be treated to a subsequent bath of sodium sulphite of one to two per cent. strength.

The use of an ammoniacal solution is also to be recommended on the further ground that a neutral solution may cause a slight deposit of sulphur.

16. If a bromide print is wanted in a hurry, it should be superficially washed and then bathed for about five minutes in a one to two per cent. ammoniacal persulphate solution; the persulphate oxidises the hypo, and during the short immersion that is necessary there is not likely to be any reduction.

The same solution may be used for the removal of yellow stains which sometimes occur on bromide prints. If the print is to be reduced, the ammonia should be omitted.

The persulphate seems to have no reaction on platinotypes.

17. Finally, another useful application of persulphate is in the restoration of old silver paper that has turned yellow.

Namias found that gelatino-chloride paper, which after four months' keeping had become quite brown, became quite white by a few minutes' immersion in a two per cent. solution of persulphate rendered faintly alkaline with ammonia. When the paper was dried and printed under a negative, good prints were obtained, but of somewhat less intensity than with the fresh paper; but this loss can be avoided by adding two per cent. of silver nitrate to the persulphate. Paper thus restored gave quite as beautiful and vigorous prints as fresh, so that the problem of restoring old paper has been solved.

\* Continued from page 232.

† The use of ammonium persulphate for this purpose was also suggested first by R. E. Liesegang.—Trans.

‡ This was pointed out also by R. E. Liesegang.—Trans.



## BACKGROUNDS, MOUNTS, AND FRAMES.

[Paper read before the Photographic Society of Philadelphia.]

As we must make a picture before we frame it, the subject of backgrounds comes at once into the foreground. It readily divides itself into two classes—natural and artificial. Let us look first at the former.

Theoretically, nature always provides a perfect background for any natural picture. The broad expanse of a landscape, the rich colour values of a sunset, the delicate tracery of winter-dressed trees, the flash of a scarlet flower against its mass of green foliage, need no assistance. The picture is there, can we but find it. It is when we begin to twist nature to our own ideals that the background becomes of importance. Of how much importance, let the impious professional "artist," who poses the peanut-eating tourist of a day, with his "Marlar" held tightly by the hand, against the majesty of Niagara as a background, tell! It is important to him, sure enough; and his efforts are apt to cause a sincere regret that his tintype machine is not a back-action dynamite bomb, warranted to destroy both ways at once.

But the thing for the photographer to consider first, in using a natural background after he has selected or composed his picture, is the matter of contrast. If his effort is being expended on a group of people outdoors, he must decide whether he will have the group major or minor—whether it will contrast with and dominate the composition, or whether it shall harmonise with the natural surroundings, seeming an incident of the time and place. The latter form is the most satisfying when well accomplished, and certainly much the more difficult of accomplishment. But either one or the other form must be resolved upon—a medium course is mostly well on the way to a mess.

Contrast in backgrounds is easily accomplished, especially in these days of wide-angle, fixed-focus, hand-camera lenses. Witness your fisherman friend, whose tremendous catch, held directly toward the lens, hasn't lost anything of apparent size because compared with the human background.

Contrast, however, properly managed, is most desirable. To pose the group so that a clump of dark foliage is back of it, or, again, to have the salient figure of a composition so that a cloudy sky gives it life, is very satisfactory. But my talk must not trench too much upon the deeps of the subject of composition. Let me but briefly call attention to the harmony of green fields, of broad lawns, of wind-swept meadows, as backgrounds for any artistically arranged outdoor picture. The medium tones, photographically, of sward, lawn, or leaf-strewn surface, blend most delightfully.

For superb contrasts, take account of the background effects of solid masses of green foliage. It is Alfred Stieglitz, I think, who has so successfully used foliage masses in outdoor portraiture. Much study may profitably be given to this branch of our art.

In passing from the consideration of outdoor or purely natural background effects, I want only to drop one word of technical warning against the use of too small stops in landscape work. I recently saw a photograph printed as an advertisement of a modern lens, which showed microscopic definition all through. There was no background—it was all foreground, and the mountains in what was intended to be the distance seemed to be cut out of tin, like a pie-crimper. I am not in love with fuzzy impressionism, but there are extremes in the other direction.

The artificial backgrounds are likely to be far more troublesome. Years ago they were easy, apparently, as any one may see in looking over old studio photographs. All that was necessary was to bring Mr. Reuben Hayseed, who wanted his picture took, into the gallery, pose him against a Louis XIV. chair, with a large red hand carefully spread out, his rotund face solemnly staring into the camera, and a fine marble staircase fading away into the background, showing, of course, the perfectly accustomed surroundings of our rural friend, and the thing was done!

Nowadays, the portrait professional has a most perfectly appointed studio, with various artistic backgrounds, which some of them know how to use. With his work we need not concern ourselves, but rather with what we can do in such work as the amateur undertakes.

It may be enunciated almost as a cardinal principle in seeking backgrounds for portraits or any other photographic work of an artistic, not technical, nature that extremes are to be avoided. A pure white sheet and a flat black surface are equally objectionable, though both may serve the purpose of the artist who understands alike their value and their danger. Indeed, there may be this one thing concerning the whole subject of backgrounds, mounts, and frames, taken as a primary fact, that the photographer must decide between harmony and contrast. There is always harmony in a well-managed contrast; but the difficulty of obtaining it indoors points the amateur to the wisdom of working first along the easier and scarcely less charming path of colour harmony without violent contrasts, until he may deem himself ready to take up the masterly methods of a Rembrandt.

For our familiar photographic work, then, we want background materials. With the principle of colour harmony before us, and the not less important thought that the background must remain a subsidiary feature, we can always work with reasonable certainty. I remember a sharp reminder I had some years ago, when a portrait was attempted in

an hotel room, without considering the wall paper. When the negative was developed, the lurid display on the wall fairly swallowed the sitter!

In arranging for a home group of the children at play, for instance, the main care as to background must be to avoid the hard lines not only of windows, but of varnished doors and furniture. In this case we want familiar surroundings, but we don't want a picture of a door with human accessories.

Simplicity is also of the utmost importance. Photograph something, but not everything; don't let your background smell of the "junk shop," or seem to be a mere gathering of *tric-à-brac*.

For the work indoors, or with artificial backgrounds, a study of the colour value of various materials will be exceedingly useful. Make a negative of pieces of all the cloths or papers you want to consider, from black velvet to a white sheet, and notice the various gradations.

Take account also of the lighting of your background. A pure white surface may be so managed as to show a gradation of shades, and a black cloth will reflect a surprising amount of light. Glossy surfaces are hard to manage, but capable of fine effects when under control. Again, remember the importance of depth, or "atmosphere," and don't have microscopic sharpness in the background.

Passing now from the consideration of the details incident to the making of a picture, we come to its after-treatment in mounting and framing. It is hardly necessary to say that the sole object of the mount and frame should be to bring out the salient points of the picture. Neither should be conspicuous, or in the least detract from whatever attention the picture deserves. Every one present can call to mind, however, numerous instances in which the contrary is the case. While it may often be assumed that, if the frame or mount is more conspicuous than the picture, the latter is not worth bothering with, there are too many instances wherein a badly chosen mount or frame has spoiled a really fine photograph or painting, to make the assumption a rule.

In no part of the photographer's work is it more important that the underlying principles be understood than in this. At the risk of challenge, I shall attempt to reiterate the vital principle governing the whole matter of mounting and framing, which, when fully grasped, renders easy the proper handling of what has been difficult to many of us. It is simply this, there must be either colour *harmony* or well-balanced complementary colour *contrast* between the picture and its mount and frame.

Happy is he who can safely and successfully arrange contrasting colours, and who is able to decide just the amount of complementary shade his picture will balance in the frame or mount! As for me, while I have once or twice stumbled into a good result in contrasts, I breathe far more freely on the safe ground of colour harmony, and will be satisfied to work up through to the higher knowledge. Though it may be well to hitch your wagon to a star, the axles will be far less liable to screech as you get along if they are lubricated with the oil of patient endeavour and intelligent, progressive practice.

Why does a platinum print look well with a Rembrandt mount? Why did black oak frames at the Salon seem just the very best setting for little gems of black and white? Simply because in both cases perfect harmony exists between the picture and its immediate environment? Look at any sepia or brown photograph on a white mount, and you see a lack of harmony. Call to mind the lovely \$1.49 department store crayon enlargement of a cabinet photograph, in its gorgeous gilt \$3.98 frame, and the very antithesis of the right thing is before you. Any black-and-white picture is damaged by a gilt frame, because there is no harmony and no correct contrast. If you must use shiny metal, a little silver line will not hurt the platinum or Velox print, simply because it is relatively white, and thus in harmony.

Following this principle to its application, we see many delightful opportunities. Do you print with Velox, and will the bromide turn your blacks greenish-brown? Don't scold; get a deep olive mat, and a frame with a dash of green, and you have enhanced the beauty of your picture. So also with other photographic tones, if they are matched in the tones and colours of the mat and frame, the result is almost certain to be pleasing.

In passing, let me suggest for consideration a new frame material, which I thought was an original scheme of my own until I found some one else had also originated it. It is simply book cloth, such as you see on the modern publications, and which comes in a great variety of shades and textures. It may be covered over wood, but I have had much interest in evolving frames made of binders' board, or tar board, covered with this cloth. The frame is flat, of course, and therein lies a merit, for its wide surface affords an excellent surface for what might be termed extra illustration. A dainty sketch in one corner, in an harmonious tone, of course, or a twig of foliage in outline, and there results an individual frame, carrying out the real thought of the artist as to the picture and its environment. These frames may be made by any one who has patience, glue, and some ingenuity, and are by no means expensive.

So far I have thought and spoken mostly of the mounts and frames for photographic work. A concluding moment may touch upon the handling of water colours and other art mediums. There is no change of principle here; it is harmony that gives the most agreeable results, unless you may hit upon proper contrast. The prevailing tint of the



picture must govern or complement the frame and mount. I have a delightful little reproduction of one of F. Hopkinson Smith's water colours of Venice. It is green water, blue sky, and a dash of high colour in the garments of the figures. I chanced upon a dark olive mat, and a deep green oak frame, and the whole thing became harmonious. I had hit the complementary contrast; and, observe, there was no gold used, either in mount or frame. This substantially upset a dictum I had been given some years ago in New York, that "water colours must always have gold mats."

Again, I have a De Longpré peony bit, a riot of reds and pinks, done with his inimitable grasp of nature. I dared not try contrast, so the frame is one of flat binders' board covered with deep red book cloth. In the slang phrase of the day, "It's all right!"

But it is unnecessary to detail practice. The one principle which is about the only grain of wheat in all this chaff is that repeatedly stated, that harmony between picture, mat, and frame must prevail, either by shades of the same colour or by skilful contrast. This principle is so simple that any one may grasp it and use it, and yet forty out of fifty photographers, and ninety-nine out of a hundred makers of picture frames, neither know nor practise this fundamental principle, or else they use it unconsciously, and thus ineffectively and uncomfortably.

J. HOWARD McFARLAND.

### BALLOON PHOTOGRAPHY.

THURSDAY last week found the members of the Camera Club assembled in goodly numbers to hear a paper by the Rev. John Bacon, whose name has recently been much before the public in connexion with certain experiments in meteorology, which he has been making by means of a balloon. The subject covers much that is new to the Club, and was especially interesting to the members, for the reason that it had a distinct photographic tone. Mr. Bacon and his daughter, who shared in most of his experiences, are both ardent photographers, and the various details connected with many ascents were consequently well illustrated by lantern pictures.

Mr. Bacon prefaced his subject by remarking upon the difficulties of making accurate aerial records, and a common tendency to overstrain a point when no real justification existed for such a course. And to emphasise this he reminded his hearers of the nervous curate, who in speaking of the fatted calf, described the animal as of special importance in having been "fattening for years."

The lecturer acknowledged the merits of those observations made in 1862 by Glaisher and Coxwell, who did wonderful work considering the resources then at their command. He also referred to four noteworthy ascents made by Mr. Welsh, of Kew Observatory, all of which showed one marked characteristic which seemed quite independent of cloud or sunshine. On each occasion he came to a certain stratum of air where the decline of temperature received a certain check followed by a recovery. Three typical diagrams made by Glaisher, during the ascents already adverted to, showed a similar state of things, the check taking place at a height of about 4000 feet. Recent experiments in America with kites proved that there was the same curious check and recovery. Mr. Welsh imagined that this change of temperature, in an unexpected direction, was caused by a kind of aerial gulf stream in the upper atmosphere.

The lecturer now began an account of some of his own experiences in cloudland, the first ascent which he described taking place from the Crystal Palace, Sydenham, at 10 p.m., under the beneficent beams of a harvest moon. On this occasion he took with him an air thermometer, the usual cased instrument not responding quickly enough to small changes of temperature. He found that there were places in the air where the temperature was warmer by 15 degrees than it was on the land below. This led him to suspect the presence of floating volumes of air, or water vapour over certain localities, and he believes that these invisible clouds affect both light and sound phenomena.

During last season the lecturer made ten balloon ascents, during which he made many tests of the acoustic properties of the air. By blowing a horn he was able, by listening for the echo from the earth's surface, to find out whether the air was acoustically transparent or opaque. Such different conditions did not seem to affect the operation of taking a photograph on the ground, and he showed a couple of pictures taken in India, one on a very dry day, and the other when the air was saturated with moisture, and both were equally brilliant.

Then came the pictorial description of a balloon ascent from start to finish. First, we saw the balloon flaccid and empty lying like a big round mat on the grass, surrounded by sand bags attached to cordage. Half an hour later, the monster has half risen from its bed, and looks like a gigantic dumpling. The next picture showed the balloon three parts inflated and ready for the ring to be fixed in position. One more picture shows the machine ready to rise from the ground directly the word is given to cast off.

Next came a series of most interesting photographs taken from the car as the aerostat rose from the ground, the pleasure-seekers—the ascent took place at the Crystal Palace—looking very tiny and curiously foreshortened. Another view showed the human dots getting smaller and smaller, until they are quite out of sight, and a mass of roofs take their place.

"From the moment of starting," said the lecturer, "the balloon does not move, nor do you feel a breath of air. But the earth behaves very differently. First it flops down suddenly, and presently begins to solemnly turn round and round."

Upon this occasion the air was so still that the heavy grapnel was left behind as a useless incumbrance. The balloon was soon above Bromley, and then it was caught in a strong north-westerly wind. The voyagers travelled along so fast by aid of this wind, that they soon came in sight of the sea. There was Beachy Head, apparently unpleasantly near. They were soon passing over Hawkhurst, and from an altitude of 8000 feet saw Hastings "approach towards them." There seemed to be only three or four meadows between them and the cliffs, and, as they had no ballast left and little spare gas, those cliffs seemed to promise disaster. All this time the captain of the balloon seemed to be in a brown study, he was looking over the edge of the car, but did nothing to avert the impending danger. Suddenly they descended into a westerly wind, they were borne along above the chimneys, and finally came down quietly in a meadow. The captain had detected this westerly current long before by watching the smoke from the Hastings chimneys, and had landed in the exact spot which he had picked out for the purpose.

Another ascent graphically described by the lecturer, and illustrated once more by excellent pictures, took place at Clifton, near Bristol, during the meeting of the British Association at that city. Here the conditions were very different, and the pictures were not half so bright as those taken during the ascent from the Palace. The aeronauts rose from the earth at five p.m. on a September evening, and soon afterwards the sun went behind a cloud, and, owing to the sudden chill, down came the balloon, in a wood. The spring of the boughs cast them off, and they finally landed quietly in a meadow. One picture taken during this ascent showed the shadow of the balloon cast a long way below on the grass, and another showed a similar shadow on the clouds.

Mr. Bacon believes that the rapidity of photographic action depends largely upon the amount of moisture present in the air. In a humid atmosphere he always secured very rapid action, but not when dryness prevailed. Under the latter state of things he never made an over-exposure.

The lecturer next referred to his experiences during the last eclipse expedition to India, and showed some very interesting pictures taken by his daughter during the period just before, and just after, totality. The pictures were each the same so far as subject went—a landscape with trees, and groups of Hindoos dotted about, "all in a mortal funk." One very curious point referred to was that the landscape five minutes after totality was double as bright as that taken five minutes before totality. The phenomenon has been noted before, but never photographed, and the common explanation given is that the eye is deceived owing to the restful period of darkness. It is suggested now, in light of these photographs, that the greater luminosity of the one last taken is due to the condensation of moisture during the time the sun is covered, and the consequent greater diffusion of light from the suspended particles. After showing some photographs taken in the Scilly Islands—where tropical conditions prevail, both with regard to vegetation and absence of twilight—Mr. Bacon described some of his acoustic experiments.

He made many attempts to sound the sky for those invisible masses of vapour which Professor Tyndall called acoustic clouds. In making sound experiments off the North Foreland, Tyndall heard distinct echoes from space, and attributed them to the presence of banks of invisible vapour. Mr. Bacon failed to obtain these results, although he used tonite cartridges, suspended 120 feet below the car of the balloon, which made a noise like a cannon. The echo from the earth came up like a deafening roar, but there was no sign from space.

Mr. Bacon's lecture was listened to with rapt attention, and his pictures were much admired. The vote of thanks proposed by the Chairman, Mr. Machell Smith, was most heartily given.

### JOURNALISTIC PHOTOGRAPHY.

MR. CLEMENT SHORTER contributes an article to a recent (April) number of the *Contemporary Review* upon "Illustrated Journalism," in which, amongst a good deal of other interesting matter, he deals with the place occupied by photography, and its future prospects. A very fair article, written by a level-headed man, evidently gifted with the saving common sense, not always the characteristic possession of many of the writers of articles in which there is an estimating of the value of photography. It is this desirable quality that allows Mr. Shorter to give its due place to photography against his evident leanings towards the work of the artist, a bias possibly acquired from, or at any rate emphasised by, his connexion with the *Illustrated London News*. Within the last nine years illustrated London journals have, he tells us, run up from five to thirteen, an increase due to photography and the substitution of mechanical processes—in turn largely due to photography—for wood-engraving. The satisfactory statement is also ventured that, whilst there will ever remain room for the artist, "photography must have an even larger place in the journalism of the future than of the past." How marked its present position in this field is may be judged from an analysis made of the illustrations of nine of the leading journals, English,



American, Italian, German, and French, of March last, in which out of a total of 328 illustrations, 213, or nearly two-thirds, are photographs. And if America's character for taking the lead, in her sharp and profitable adaptability to any newer order of things, hold good here, the probabilities of the prophetic increase referred to are strengthened when it is noted that photographs form nearly eighty-eight per cent. in the American publications given. It is very evident that there is a heavy demand for photographic work, and if Mr. Shorter be correct in his further assertion, that it is mainly the mechanical difficulty of rapidly printing half-tone drawings and photographs that bars the extended introduction of illustrated newspapers, when these technical difficulties shall have been got over, the amount of photographic illustration will be multiplied many times over.

The work of the artist must ever claim a high, if not the highest, place, and one very important qualification of the successful editor, as put by the writer already quoted, is "skill in realising the limits of the artist and the limits of the photographer." The same applies in a marked degree to the photographer himself. A very great number of the photographs at present appearing are not good ones; what must the far greater number of those rejected be like? If practicable, by the way, how interesting and instructive would be an occasional supplement both of illustrated and non-illustrated papers giving photographs, drawings, and articles rejected as unworthy of an orthodox place!

Referring to some of the difficulties standing obstinately in the way of good photographic work, and that require something of imagination to conceive as ever cleared away, there is, to begin with, the so-decided demand for strongly spiced meat; one that the camera requiring reality as a *sine-quâ-non* to work upon is at once out of the running. The unhappy sailor must be half way down the shark's throat, as it were, the bodies of the victims of an explosion be shown in mid air, the colliding trains in the actual smash, the wrecked vessel in the act of striking upon the reef or breaking in two. No camera, however well helped out at the retouching desk, can accomplish this style of thing; here is fair room, at any rate, for the artist, with his imagination, suggestion, or what not, that he is so fond of taunting his competitor the photographer with the lack of. With journals cast in quieter mould, the popular royal, commercial, or civic functions, as shown in wedding, christening, directors' meeting, or complimentary feast, are also photographically out of it. It is possible that the public may turn for its pabulum to less spicy and more nutritious directions, and that our lenses and working material generally may become so improved in range and excellence as to give the camera a chance where now useless; but, without troubling ourselves about the future, there is ample room for the accomplishment of better results all round with the power we now have at command. The praiser of times that have been in illustrated work has some room for his discontent, for, apart from the descriptive letterpress being oftentimes so evidently written up to the pictures, these are themselves not worth writing up to, the combined result being a stiff mechanical production without spring and elasticity—a concrete floor to sleep—or try to—upon, instead of a feather bed.

One of the chief causes of failure lies in not recognising what is advantageously photographable; there is an effort to gain the older effect of the sketcher and artist by means of the camera. It cannot be done, more than the flavour of freshly caught trout can be expected in a tin of potted salmon because both are fish. Still potted salmon is very good eating, and if we cannot afford the time, and lack the skill, to catch the trout, we must make the most of the other. Take a case more to the actual point in illustration. We frequently have a photographic picture of an important football match; but who can call it a satisfactory one, or to be compared in interest with a spirited sketch? Are not the players pigmies? Is not the all-important ball a dot? and does not the field run into uninteresting foreground, without even the inevitable frightened dogs snoring across it? What satisfaction is there in the whole to one who has seen the match, or a similar one? How can it compare with the rush and go of his mental picture? Well, but who can expect it, with the players twenty or thirty yards off, in constant motion, on a dull winter's afternoon? Then, why try for it, and hold that you have a picture worth printing of a football match? The illustrative aim should be in a different direction. The forward player who led the rush, the three-quarters who did the passing, the goal-keeper who defended so well, would probably not be at all averse to being photographed after the game, and the pictures could be made successes. Come to think of it, why should the convention have obtained of taking a football team always before the play in the inevitable pyramidal semicircle? Would not a picture afterwards, with the telling marks of the play upon them, be far more interesting? Although the full life and soul of the game cannot be thus presented, it is yet possible, with truer aim and a streak of luck, to catch a characteristic and telling bit here and there—a scrimmage near, or line out from, the touchline, a flash of fast play near the goal. The same applies everywhere else—the review of troops, horse race, boat race, procession, and so on. How rarely is there anything of individuality introduced into practice. Given something to photograph, will not nine out of ten set about it in the same way, from the same point of view, and turn out much the same picture in all essentials? The Editors of the JOURNAL in the number for April 14, in a comment upon the prevailing complaint of pay and treatment by assistants, hit the matter

off very sensibly by saying that "the simplicity of modern photography is responsible for flooding the photographic labour market with an overwhelming amount of mediocre ability which is usually remunerated in the exact ratio of its value. On the other hand, in photography as in every other pursuit, the law holds good that talent is bound to assert itself in the long run." Now, I take it that no mean portion of the talent referred to would consist in presenting to the camera work that, from a thoughtful predetermining, as well as technical, knowledge of its power, it could do to advantage. A very difficult task when the many limitations of the camera are taken into account, and one corresponding in kind and degree to the higher power of the artist in truly conceiving and designing his picture.

The public demands illustration of a certain event or occurrence, and that editor is smart or otherwise who can best anticipate the value of the demand, and meet it; but it should rest solely with the photographer as to the best way of conveying the desired impression. It resolves itself naturally, like everything else, into a premium upon the intelligence of a worker in a special direction; partly in a technical knowledge of what his tools can do, but principally in a broader conception of what impression the full finished result is expected to give, and giving it. It is a great pity that these two factors have something of oil-and-water character about them; they do not mix well together from some reason or other, probably a natural one if we could go deep enough to find out, for it is by no means confined to photography. The technically excellent man, from too close an attention possibly to the strict rules and formulae that have brought him his excellence, is not often disposed to go beyond, whilst the other, rich in breadth of idea and thought, regarding himself as a quart-jug man, as it were, despises rather what he takes to be the pint capacity of the other, and, from impatient disdain, does not pay sufficient attention to the more commonplace means by which only his ideas can bear profitable fruit. There are a few, very few, who have the two qualifications in an ample measure—two-quart men; I wish I were one—they are certainly the ones who will root highest in the branches of this growing tree of photographic illustration.

J. REES.

## THE ANALYSIS OF GLUE.

(*Chemiker Zeitung*.)

Two new methods have recently been proposed for the analysis of glues. Stelling (*Chem. Zeit.*, 1896, xx, 461) recommends the estimation of the non-gluey material; Fels (*Chem. Zeit.*, 1897, xxi, 55) proposes estimating the viscosity of a solution of the glue.

I have made a number of experiments to determine the relative values of these two methods, and I propose to record briefly the results I have obtained.

Stelling's process consists of adding to a solution of glue (1 part of glue to 4 parts of water) alcohol at 96°, in small quantities at a time, while constantly stirring (we take 15 parts of glue and 60 parts of water, and make up to 250 c.c. with alcohol).

We then determine the proportion of non-gluey matter present by evaporating down an aliquot part of the alcoholic solution, previously filtered, and weighing the residue. This process is thus based on the supposition that alcohol at about 72 per cent. in volume leaves the glutine intact, while it dissolves the products of decomposition, considered as non-gluey material.

I should here remark that the products meant by the term "non-gluey" should not be considered as products of decomposition of the glutine; they are also found in the original solution of glue before it has undergone any destructive process by evaporation. I would also remark that the supposition that alcohol at 72 per cent. is best for separating the glutine from the products of decomposition does not rest on any theoretical considerations, and, if we proceed exactly according to Stelling's instructions, this separation does not even take place.

Glutine is not entirely insoluble in alcohol at 72 per cent., inasmuch as, on evaporating down the filtered alcoholic solution, we obtain a residue consisting principally of glutine, and possessing a strong adhesive power almost equal to that of the original glue employed.

Nevertheless, it cannot be denied that Stelling's process has a certain value—very small, it is true—for the valuation of glues; above all, when we have to deal with products of superior quality, products containing substances soluble in alcohol, in quantities much smaller than are present in ordinary glues.

Fels' method—that is, the determination of the viscosity—can also give very useful indications, but here, again, there are certain reservations which must be made. The viscosity is determined at 25° with an Engler viscosimeter. I claim to have discovered that solutions of glue undergo, after a more or less prolonged time of standing, modifications from the point of view of fluidity. In this way a freshly prepared solution had a viscosity of 9.0°, but, after standing for twenty-four hours, it had assumed a gelatinous consistency. Another solution underwent the following modifications: its degree of viscosity was 3.7 after two hours, 4.8 after twenty-four hours, and 5.4 after forty-eight hours.

I would here recall that the process I described (*Chem. Zeit.*, 1893, xviii, 726), some years ago now, while being somewhat more complicated than the above, merits more confidence in judging the value of the glue.



This process consisted in measuring the consistency of the jelly formed by 100 grammes of glue and 300 grammes of water.

The question of determining whether a given glue is good or bad is one which is not easy to decide, unless we have to deal with a product that is altogether inferior. In the greater number of cases we simply endeavour to decide whether the glue is suitable for such-and-such a purpose.

As far as the adhesive power is concerned, I have shown, by numerous experiments, that from this special point of view, the glue from bones, which is of a decidedly inferior quality, is quite as good as that made from skin, which is of a superior quality. It is quite another matter in so far as the consistency of the jelly is concerned. The researches which I have carried out in this direction lead me to the conclusion that the jelly made from glues from skin is generally firmer than the jelly derived from glues from bone.

In the examination of a glue it must not be forgotten to notice the smell; this characteristic may give very useful indications as to the resistance of the product, and its tendency or not towards putrefaction; with regard to the above, skin glues are much better than those made from bone. Finally, the proportion of acid present in a glue is a matter of capital importance for certain purposes for which it is required. The method I have proposed (*Chem. Zeit.*, 1897, p. 691, and 1892, p. 1816) for the estimation of free and combined sulphurous acid, has once more enabled me to satisfy myself that glues from skin are superior to glues from bone. The determination of the water, ash, and fatty matters gives less important indications.

RICHARD KISSLING.

### CHEMISTRY IN PHOTOGRAPHY.

As the science of photography is based upon that of chemistry, it is remarkable how little chemistry is understood by professional photographers, let alone amateurs. Many amateurs do not know the various weights and measures, and I have known some quite unaware that the fluid measure contained fluid ounces, and, when they have required so many ounces of a solution, have weighed it by avoirdupois weight; had they even weighed it by apothecaries' weight, they would not have been quite so much out, but even then what a long and troublesome way against the measure.

Unfortunately, some of our English weights and measures are a little confusing, the legal English weight being the avoirdupois, with—

16 drachms.....	1 ounce or 437½ grains.
16 ounces.....	1 pound „ 7000 „

This is of little use in photographic solutions, emulsions, &c., owing to its being practically indivisible, and the generally used photographic weight is the apothecaries', with—

20 grains.....	1 scruple.
3 scruples.....	1 drachm or 60 grains.
8 drachms.....	1 ounce or 480 „
12 ounces.....	1 pound or 5760 „

This is a very useful weight, owing to its easy divisibility, the ounce being divisible by 2, 3, 4, 5, 6, 8, 10, 12, 15, 16, 20, 24, 30, 32, 40, 48, 60, 80, 96, 120, 160, 240, and of course by itself, and it is doubtful if any other weight is capable of being so much divided. In addition to this advantage is the fact that it exactly coincides with fluid measure, the table of which is—

60 minims.....	1 drachm.
8 drachms.....	1 ounce or 480 minims.
20 ounces.....	1 pint or 9600 „
160 ounces.....	1 gallon or 8 pints.

Chemicals are invariably bought by avoirdupois weight, while formulae are almost as invariably given in apothecaries'; consequently, if an ounce avoirdupois is taken, where an ounce apothecaries' is meant, there is a deficit of 42½ grains—rather a serious matter in working.

The metric system is very much advocated now, experimental chemists especially using it a great deal, but at present it is not very generally used or understood in England, although many efforts have been made to popularise it, the enormous expense necessary for the change being all against its general adoption. The multiples in this system are all in tens, and multiples thereof. The standard is the gramme, which was intended to be, and practically is, the weight of one cubic centimetre (c. c.) of distilled water at 4° C. or 39° F., its point of greatest density. The gramme is divided and multiplied by tens, the different weights being expressed by prefixes to the word gramme, as kilogramme, commonly called kilo=1000 grammes, or rather more than 2½ lbs., more correctly, 2.2046 lbs., the full table being—

10 milligrammes.....	1 centigramme.
10 centigrammes.....	1 decigramme.
10 decigrammes.....	1 gramme.
10 grammes.....	1 decagramme.
10 decagrammes.....	1 hectogramme.
10 hectogrammes.....	1 kilogramme.
10 kilogrammes.....	1 myriagramme.
10 myriagrammes.....	1 quintal.
10 quintals.....	1 tonne or millier.

The word gramme being dropped in the last two weights, the fluid measure coincides with this, the standard being the litre, and the full table being—

10 cubic centimetres.....	1 centilitre.
10 centilitres.....	1 décilitre.
10 décilitres.....	1 litre.
10 litres.....	1 décalitre.
10 décalitres.....	1 hectolitre.
10 hectolitres.....	1 kilolitre.
10 kilolitres.....	1 myrialitre.

The litre is slightly more than 35 fluid ounces, or 1½ pints.

Many of the chemical terms used in photography are Greek to the average photographer. He reads in the various technical works of halogens and haloid salts, but usually has no idea of what is meant by them. The halogens are the elements bromine, chlorine, and iodine; and the haloid salts the various metallic iodides, iodates, bromides, bromates, chlorides, and chlorates. The chemical symbols and equations given in the various formulae are quite foreign to many. They see it stated in an article that



by what is known as double decomposition or the changing of  $\text{AgNO}_3$  to  $\text{AgCl}$  and  $\text{NaCl}$  to  $\text{NaNO}_3$ , but they are little, if any, wiser for the information.

$\text{AgNO}_3$  is the chemical symbol for silver nitrate, which is formed by the action of  $\text{HNO}_3$  or nitric acid upon  $\text{Ag}$ , this latter being the chemical symbol for silver, the full name of which is Argentum.  $\text{NaCl}$  is the chemical symbol for sodium chloride or common salt.  $\text{Na}$  is the abbreviation of natrium, the chemical name for sodium, and  $\text{Cl}$  the abbreviation of chlorine.

One of the most necessary lessons to be learnt in chemistry is the atomic theory or law of combining proportions, discovered in the early part of the present century by the great John Dalton, which has done almost more than anything else to make chemistry a workable science. It is assumed in this theory that each element (in chemistry any substance which chemical knowledge has been unable to split up into two or more ingredients is called an element) is composed of atoms or indivisible particles, and that every element (of which, at the time of writing, there are sixty-five) has a distinct atomic or combining weight, so that, whenever any chemical compound is formed, the combination always takes place in those proportions or multiples thereof. Hydrogen, which is the lightest element known at present, is taken as the unit, and its atomic or combining weight is known as 1, the weights of the other elements varying up to thorium or thorium with an atomic weight variously given as 231.5 and 238, the atom of thorium thus being that much heavier than the atom of hydrogen. In the old books upon chemistry we find the atomic weight of hydrogen given as  $\frac{1}{2}$  and the weights of the other elements in multiples of this, but it will be readily seen that the present system is a much more convenient and workable one. Taking the aforementioned equation as an example.  $\text{AgNO}_3$  is a compound of silver, nitrogen, and oxygen in the proportion of 1 part silver, 1 part nitrogen, and 3 parts oxygen, as expressed by the symbols, the atomic weights of which are  $\text{Ag}$  108,  $\text{N}$  14,  $\text{O}$  16, giving  $\text{AgNO}_3$  the combined atomic weight of 170; and, presuming that we take 170 grains of  $\text{AgNO}_3$ , and analyse it, we should find 108 grains silver, 14 grains nitrogen, and 48 grains oxygen; with  $\text{NaCl}$  we find the atomic weight of  $\text{Na}$ , or sodium, is 23, and that of  $\text{Cl}$ , or chlorine, 35.5, giving the combined weight of  $\text{NaCl}$  as 58.5, so that, presuming we dissolve 170 grains of  $\text{AgNO}_3$  in half a fluid ounce of distilled water (distilled water must always be used where accuracy is required) and 58.5 grains of  $\text{NaCl}$  in another half fluid ounce of distilled water, and mix the solutions, we should get 143.5 grains of  $\text{AgCl}$  (silver chloride) precipitated, and 85 grains of  $\text{NaNO}_3$  (sodium nitrate) in solution, thus proving that the various elements have merely changed places, for we find, by adding 170 to 58.5, we get 228.5, which is also the sum total of 143.5 and 85. This wonderful discovery enables us to find the requisite quantities of two or more elements necessary to form a compound when once we know the atomic or combining weights of those elements; and this is easily obtained, for all good works upon chemistry give a table with the names, chemical symbols, and atomic weights of each element, and by this beautiful arrangement the chemical symbol of a compound also gives us the weight of the atom of that compound by simply adding together the combining weights of the elements contained in it, when the sum total is the atomic weight of that compound. This law is found to be invariably the same in any chemical change, where a complete chemical decomposition has taken place, but does not hold good in mixtures where no chemical change has taken place and where, no matter how finely powdered and carefully mixed, the elements may be present in any proportion.

The measures used in measuring fluids are the same which chemists use in dispensing drugs and prescriptions, and the usual sizes are 1 drachm, 1 or 2 ounces, and 10 ounces; the drachm measure is divided on the glass of which it is composed in 5 minim quantities up to 60 minims or 1 drachm; the ounce measure is generally divided into  $\frac{1}{2}$  drachm, drachm  $\frac{1}{2}$ , drachms 2, 3, and so on up to 8 drachms or 1 ounce; the 10-ounce measure is divided into  $\frac{1}{2}$  and whole ounces up to 10 ounces; the figures are also engraved upon the glass, each 10 minims being



figured in the drachm measure; 1, 2, 4, 6, 8 drachms in the ounce, and each separate ounce in the 10-ounce measure.

The study of chemistry will be found not only invaluable in photography, enabling amateurs especially to economise largely in making their own solutions instead of having to buy them ready-made, thus knowing the composition instead of working in the dark, but useful and instructive in many other walks of life, well repaying the trouble taken in learning. It is not to be expected that every photographer can obtain a complete knowledge of chemistry on account of the time and expense involved, but enough can be learned easily and cheaply, thus enabling the photographer to understand many of the changes which take place in photography, and preventing many errors; and, although a little knowledge is said to be a dangerous evil, it need not be so in this case if properly used.

C. T. SUTTON.

#### ART PRINCIPLES APPLIED TO PHOTOGRAPHY.

On Tuesday evening, April 25, Mr. Alexander Keighley, F.R.P.S. (President of the Bradford Photographic Society), lectured on the above subject at the Philosophical Hall, Park-row, Leeds, before the members of the Leeds Photographic Society. Mr. Godfrey Bingley said it was a very great pleasure to him to ask Mr. Keighley to give his lecture, as he was so well known, not only to the photographic world of Yorkshire but throughout the country.

Mr. Keighley, in introducing his subject, said a photograph is not necessarily a picture; a picture might be a photograph, but some knowledge and skill in art is requisite for the one, and might be conspicuous by its absence in the other. On two different days two men go out and photograph the same scene—a cottage, with a group of trees, but with quite different results; in the one case, one operator secured something more than a mere likeness of the place, investing it with a certain charm which will give delight and pleasure to those who have never seen the spot; the other looks commonplace, and would be interesting only to those who have some association with the place or know it well. In other words, one was a picture and the other a photograph. The reason was not far to seek. One used his camera as an artist, studied the composition of the picture to harmonise the whole effect, selected the most suitable light, as well as the proper time of day and the year, and, lastly, introduced a figure or figures in keeping with the scene and the sentiment of the subject; the other was a mere mechanical reproduction of the details of the scenery, and, if figures were introduced, they had come into the picture as it were by mere chance and had very little relation to the surrounding scenery, and would perhaps have been better left out altogether.

The difference was not the fault of the camera and lens, but one of knowledge of the rules of art or artistic perception, which might be largely intuition or as a result of long experience.

People were very ready to assume that photography was merely mechanical, and that pictures produced by its aid could not be artistic because the camera was merely a soulless implement. It depends on the hand that manipulates them and the brain behind the hand, and the photographer could use his camera pretty much in the same spirit as the artist. He did not want to claim too much for photography; although a man might not soar to the highest flights of genius, still he did think it might serve as a means of artistic expression.

To succeed in pictorial photography, the amateur must know how to handle his tools, be able to master exposure, development, and all the rest, and be able to produce a clean, sharp, technical negative, and also any desired effect by modification in chemical process and treatment. There should also be a training of the mind to see artistic pictures, largely attained by studying books on art and the works of great masters of art in the art galleries and in photographic exhibitions.

In speaking of art the term was very vague, and there must be something grasped and connecting it, and this he proposed to do as fully as possible by means of diagrams, drawings, &c.

One who wished to succeed in pictorial photography must have some knowledge of the rules of art, rules of composition, light and shade, fitness of details and accessories. As well might a man purchase a camera and brushes, and expect to go out in the country and obtain a painting which is to be a work of art, as a photographer who is entirely ignorant produce anything analogous. The object of composition is to present the subject in an agreeable manner, and to seek harmony and unity, to give pleasure to the eye without sacrificing any of nature's laws.

The first elementary rule is evidence of uniformity. The principal object ought never to be placed in the centre of a picture, and this applies very particularly where objects are of considerable height vertically or length laterally. A church with a tall spire should not be placed in the middle of the picture. Another thing to be avoided is the sameness of size and proportion. Straight lines running across the picture from side to side are another eyesore, and means should be found of breaking them up.

And now let us consider variety of composition. In making pictures two difficulties confront one at the outset. In the first place, we have to present on a plain surface, a subject which really occupies all various distances from foreground to extreme distance. A knowledge of com-

position gives the idea of separation of various planes, so that, when we look upon a picture, we lose the flat surface and feel we can look right into it, the foreground standing out and the distance far beyond. Composition helps us to convey the idea of space, and to do this we must not place objects perpendicularly over one another or horizontally level with one another; to do this carries out the straight lines that surround the picture generally or horizontally parallel to the bottom line of the picture.

Corresponding projections and horizontal similarities give no idea of distance in a picture except that effected by light and shade. Figures placed underneath principal objects did not give any idea of distance. The laws of composition were not mere arbitrary laws, but dependent on the free constitution of the mind itself, and the result of an experience of a lifetime to many who have given the whole story to the subject.

The next point in composition is the balance of lines, where there are a considerable number of lines running diagonally across the picture; some other lines placed at the reverse angle should be sought in order to compensate or give balance. Clouds very often come in useful as balancing lines. As to the balance of objects, in every picture there should be a principal object, and a secondary object to balance. These two should not be of equal importance, for, if this is so, the eye is distressed, and wanders about from one prominent object to the other. The principal object should form the key-note of the picture, and should be so prominent that the attention of the eye is at once taken to it; after this it may be drawn to the secondary one, and back again to the scenes on the principal object. In every picture there are also strong parts and corresponding weak parts. The weakest part is, of course, the centre of the picture, and no prominent object should be placed there, because it divides the picture into two and cuts it up into equal parts, and does not give the element of variety. A good way is to divide the picture into three parts, horizontal and vertical. Upon one of the parts one principal object may well be placed, and a balancing object of smaller importance on another part. This rule should not be adhered to in any mechanical way; circumstances alter cases, and it is very useful to have such a rule in one's mind, and to borrow from it only in combination with knowledge and discretion. If they studied the works of great artists, they would find that they had not been worked out in haphazard fashion. In making the general outline or scheme, they will follow some geometrical plan, although not made evident, as they remember that the principal object of art is to conceal art. Sometimes a diagonal line is made a sort of basis for the composition, at other times a pyramid, and others a circle.

A question often arose as between the photographer and the artist as to how much ought to be included in the picture. No law could be laid down. It is a subject which certainly calls for taste and discrimination of each individual brought to bear on each subject.

In conclusion, the lecturer said, in these days of photography made easy, it is necessary sometimes to remember, to obtain good pictures, forethought and careful consideration are necessary to the photographer, and that he, as well as the artist, should think his subject out for himself. His endeavour that evening had been to show that in photography there is ample scope for some of the highest powers by which man had been endowed by his great Creator.

The lecture was illustrated with a profusion of lantern views, and the lecturer frequently showed that the principles for which he was contending were exemplified in the works of the great masters. A cordial vote of thanks was accorded to Mr. Keighley.

#### ON THE SOLUBILITY OF ARGENTIC BROMIDE AND CHLORIDE IN SOLUTIONS OF SODIC THIOSULPHATE.

[American Chemical Journal.]

In the course of a series of experiments having a practical end as their chief aim, several determinations of the solubility of argentic halides in solutions of sodic thiosulphate were made. Since the data concerning this reaction are none too plentiful, it seems worth while to record briefly our incomplete work upon the subject.

The method of procedure was extremely simple. Solutions of sodic thiosulphate of known strength, made by dissolving weighed amounts of pure recrystallised material in water, were agitated for varying lengths of time in test tubes at a fixed temperature with an excess of argentic salt. The bromide had been freed from chloride by long-continued digestion with potassic bromide, and both argentic halides had been carefully washed, dried, and powdered. At the end of the allotted times, the agitator was stopped, the heavy precipitates were allowed to settle, and two portions were taken from each perfectly clear supernatant liquid by means of an accurate 5.00 c. c. pipette. The silver in these portions was now precipitated by sulphuretted hydrogen and collected on a Gooch crucible. Subsequently, the mixed precipitate and asbestos were treated with nitric acid in excess, the nitrous fumes were expelled, and the silver in the mixture was determined by Volhard's method.

The agitator, based upon the apparatus of Noyes (*Zeit. Phys. Chem.*, ix. p. 606; also Schröder, *Ibid.*, xl. p. 454), consisted simply of a rotating rod with a number of flat strips of brass soldered at right angles



to its axis. The rubber-stoppered test tubes were strapped to the brass strips by means of rubber bands, and the whole was immersed in a large Ostwald thermostat. A portion of the water of the thermostat was drawn off when it was desired to remove the solutions, so that the mouths of the test tubes might be uncovered, and, of course, the projecting mouths were carefully dried. A spring curtain-rod supporter, easily obtained in New England, formed a very convenient support for the rotating rod when soldered to the sides of the thermostat. The results with the second solution showed that four hours' agitation was enough to ensure saturation. No claim of great accuracy is made for the figures—indeed, the variations among them show their crudity—but they more than sufficed for our purpose, and are trustworthy enough to form an adequate basis for the remarks which follow.

*The Solubility of Argentic Bromide in Solutions of Sodii Thiosulphate.*  
Temperature = 35°.

Cryst. sodii thiosulphate in litre. Grammes.	Weight of silver found in 5 c.c. solution. Gramme.	Time of agitation. Hours.	Weight of AgBr corresponding to each gramme of thiosulphate. Gramme.	AgBr corresponding to $\text{Na}_2\text{S}_2\text{O}_3$ . Molecule.
1.	0.110	4	0.376	0.496
2.	0.108			
3.	0.106			
4.	0.109			
	0.108			
5.	0.228	4	0.390	0.515
6.	0.224			
7.	0.225			
8.	0.225			
9.	0.226	16	0.390	0.515
10.	0.223			
11.	0.220			
12.	0.223			
	0.224			
13.	0.339	4	0.397	0.524
14.	0.340			
15.	0.347			
16.	0.341			
17.	0.344	4	0.427	0.564
18.	0.337			
19.	0.337			
	0.341			
20.	0.613	4	0.427	0.564
21.	0.611			
22.	0.611			
23.	0.619			
	0.613			

It is thus evident that the quantity of argentic bromide increases more rapidly than the quantity of the thiosulphate. In this respect the behaviour of the bromide resembles that of the chloride, as observed by Stetefeldt (*The Lixivation of Silver Ores*, Craz and Gerlach, Freiberg, Saxony). Hence, simply judging from the solubility, one has a right to infer that the solubility concerns itself with the undissociated part of the sodic salt, for this is the part whose proportion increases when the concentration is increased.

The nature of the equilibrium is obviously so complex that the molecular ratios could not be expected to consist of simple whole numbers. Neither could the solubilities of the two halides be expected to conform to one another. In order to test this point, the solubility of argentic chloride in a solution of sodic thiosulphate containing 200 grammes of the crystallised salt to the litre was determined. Four parallel analyses of 5.00 c.c. of the solution saturated at 35° yielded respectively 0.344, 0.341, 0.342, and 0.341 gramme of silver, or, on the average, 0.454 gramme of argentic chloride per gramme of sodic thiosulphate. (Russell found 0.400 and 0.485 by two different methods; the first was evidently not saturated, the second supersaturated; Stetefeldt, pp. 19, 20.) Thus the molecular ratio was in this case 1:0.78 instead of 1:0.52 as in the case of the bromide. The difference is undoubtedly due to the different solubilities of the argentic halides in water, which, of course, must be factors in the complex equilibrium.

It is well known that from these solutions two well marked double salts (Herschel, *Edin. Phil. Journ.*, 1819, i. 26 and 398; also Lenz, *Liebig's Ann. Chem.*, 1841, xl. 94)—or, more probably, complex salts—may be obtained by crystallisation; but, of course, this fact does not show that these salts exist in the solution. As Barth (*Z. it. Phys. Chem.*, 1892, ix. 217) has pointed out, however, the inability of the solution to give the ordinary reactions of silver shows that a complex ion must be formed. More light might obviously be obtained from observations on the freezing and boiling points, as well as of electrolytic con-

ductiveness; indeed, Barth made an interesting beginning in this direction, and obtained evidence of the existence of a trivalent acid ion in the solution.

We proceeded in a somewhat different manner. Instead of studying the behaviour of the pure double salt, we observed the change in the freezing point caused by the addition of argentic bromide to solutions of sodic thiosulphate. In one trial, the addition of 0.8 gramme of argentic bromide to 26 grammes of a 0.54 mole solution\* of sodic thiosulphate raised its freezing point 0.08°, while in another trial the addition of 0.25 grammes of argentic bromide to 19 grammes of a 0.4 mole solution raised its freezing point 0.03°. Further additions in both cases produced no further rise, although much more argentic bromide dissolved; indeed, in the first case, a slight fall was subsequently observed.

According to modern hypothesis, such a rise in the freezing point can be produced only by the diminution of the number of active particles present. In the present case, the addition of another salt with different ions must, as usual, increase rather than diminish the dissociation of the sodic thiosulphate molecule; hence it could have diminished the number of active particles only by causing some of the undissociated material to condense into a complex structure, in which the silver is combined. Thus further evidence of the plausibility of Barth's conclusion as to the existence of a complex ion is afforded. The fact that, upon the further addition of argentic bromide, no further rise is produced, may be accounted for by the possible concomitant formation of another complex group, containing more silver—a reaction which might involve an increase in the number of active particles. The substances corresponding to these stages may well be the salts  $\text{Ag}_2\text{S}_2\text{O}_3 \cdot 2\text{Na}_2\text{S}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$  and  $2\text{Ag}_2\text{S}_2\text{O}_3 \cdot 2\text{Na}_2\text{S}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$ , which are actually known in the solid state. The double formula is assigned to the second salt simply in order to show at a glance that it contains more silver than the first. It is more likely that this second salt possesses a simpler formula, and that its partial formation, even in the beginning, prevents the rise in the freezing point from being as great as it would be if influenced by the formation of ions of the first salt alone.

In the course of the work the depression of the freezing point of water, caused by the addition of sodic thiosulphate, was also observed, as follows:—

Gramme molecule in litre.	Depression of freezing point.
0.202	0.855°
0.404	1.590°
0.535	1.980°

In brief, this paper contains data concerning the solubility of argentic bromide and chloride in solutions of sodic thiosulphate, cognate results upon the freezing points of the solutions, and a few remarks upon the probable nature of the complex substances formed. The subject is one of great interest, but the time at our disposal, as well as the inherent obscurity of the equilibria of concentrated mixed solutions, does not suffice to present a more complete view of the details of the reaction.

THEODORE WILLIAM RICHARDS,  
HENRY BURNELL FABER.

## Our Editorial Table.

### THE NEW TELLA CAMERA.

Manufactured by the Tella Camera Company, Limited, 110, Shaftesbury-avenue, W.C.

SINCE its introduction, in the summer of last year, the manufacturers of the Tella Camera have found opportunity of adding some improvements to that popular instrument, although it must be confessed there was very little scope available for such a purpose, the Tella, as it was first seen, creating a general impression that the *ne-plus-ultra* of hand-camera construction had been reached. The improvements that have been made attack detail rather than principle. Dimension and weight have been reduced, so that now the No. 3, or first-grade Tella, measures only 8 inches by  $6\frac{1}{2} \times 3\frac{1}{2}$ , and thus is comfortably carried in any position on the cycle, while the weight, charged with fifty films, is but three pounds six ounces—a veritable featherweight, considering what the Tella is set by its constructors to do in the way of photographic work. Of especial value is the fact that the camera is now given the motions of horizontal and vertical fronts.

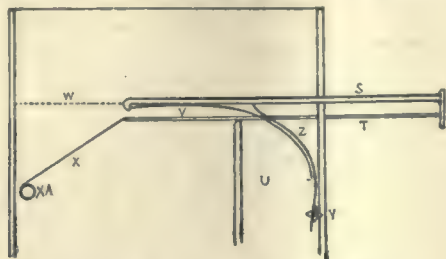
There is so much concentrated ingenuity in the design and construction of the Tella changing principle that we here describe it in full, the diagram easily enabling the reader to follow the progress of the film from the focal plane to the storage chamber.

The camera is shown in the position in which a film is being changed, with the lens pointing downwards. *s* is the septum partly withdrawn; *r* is a fine wire rod, which helps to guide the septum and keeps it square. One is at the extreme left-hand side, whilst there is another on the right-hand side. The ends of these two rods are connected with a roller blind, *x*, which is automatically wound up, when out of use, by roller

\* That is, a solution containing 0.54×248.3 grammes of sodic thiosulphate in a litre. Such a solution would be called by some a 0.54 normal solution; but it seems to us that this nomenclature is an unfortunate one, and that the term "normal solution" should be reserved for the equivalent solutions so useful in volumetric analysis.



spring, xA. The chamber, w, is where the unexposed films are inserted. The septum, s, is shown being withdrawn with a film, v, held in its claw. z is a German-silver guiding spring. When the septum is being drawn outwards, it lifts the carrier, v, into the chamber, u, which is reserved for the reception of the films after exposure. It will be seen how the film is safely guided by the spring, z, from one chamber to another. As the edge of the film passes by the indicator, x, it changes the number, showing how many have been exposed. Should the septum be withdrawn without a film in it, it will be seen that there will be nothing to work the indicator. When the septum is right out, the film is left flat in the exposed chamber, and these films are held by springs to prevent them lying loosely in the compartment; also, when the septum is quite with-



drawn, the roller curtain is unwound off xA. When the front film is removed, there is nothing to support the small separator; it therefore falls upon the curtain, and either slides straight away into a small chamber for its reception, situated just below xA, or is carried into it by the blind as it is automatically wound by the roller spring, xA. The chamber that holds the separators is only open whilst the septum is withdrawn. At all other times it is closed, and it is not possible for them to become loose in the camera.

What takes place when the septum is being returned to its proper position is, that it first causes all the separators to be bent backwards or rearwardly, and all the unexposed films with them, except the front one. Between the front one and all the rest a wide space is left, and down this space the septum enters. Thus only one film is left absolutely flat in front of the septum, whilst all the others are protected behind it.

To further praise the Tella would be equivalent to painting the lily or gilding refined gold. Let us therefore only add that, besides the No. 3 (or de Luxe Tella), there is now a No. 2, and that the difference between the two instruments is shown by the appended extracts from their respective specifications.

#### No. 2.

*Lens.*— $5\frac{1}{2}$  Krugel, best quality rapid rectilinear.

*Aperture.*— $f/8$ , diaphragms  $f/6.5$ ,  $f/8$ ,  $f/11$ ,  $f/16$ ,  $f/22$ ,  $f/32$ .

*Focus.*—Fixed. Range ( $f/11$ ): Horizon to 24 feet. Tella magnifiers may be added for objects as near as six feet.

#### No. 3.

*Lens.*—5 inch Cooke Anastigmat.

*Aperture.*— $f/6.5$ , diaphragms  $f/6.5$ ,  $f/8$ ,  $f/11$ ,  $f/16$ ,  $f/22$ ,  $f/32$ .

*Focus.*—Camera itself is made to focus. An accurate scale is engraved, which permits focussing as close as two yards. No magnifiers required.

*Rising Fronts.*—Both horizontal and vertical. These can be used with the largest stops.

*Finders.*—Two, for vertical and horizontal pictures respectively. The Adams Patent Brilliant.

For the rest we may remind our readers that the Tella cameras take fifty cut films without backing pieces of any kind, the shutters working from  $\frac{1}{2}$  to  $\frac{1}{125}$  second, indicators registering the exact number of exposures made, a function performed by the film itself in its movement after exposure. Finally the cameras can be used either in the hand or on the stand. Than the Tella there is no more ingenious or beautiful machine on the photographic market, and, as time goes on, we expect its popularity to increase in the ratio of its age.

#### MERCK'S PYROGALLIC ACID.

E. Merck, 16, Jewry-street, E.C.

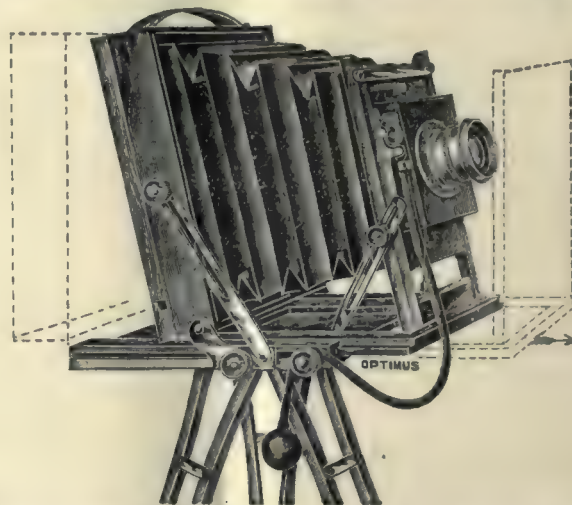
SOME years ago, when the "new developer" fever was nearing its maximum temperature, we heard a very well-known photographer at one of the meetings of a London photographic society make the remark that, if pyro were only then newly introduced, it would be hailed with great delight. Since that time several additions have been made to the list of our developing substances, but pyro still remains first favourite for negative work. In our opinion there will always be a constant and steady demand for pyrogallol, which experience shows, used with either soda or potash, gives the maximum amount of satisfaction as a developer. Hence special interest attaches to the introduction upon the English market of Merck's pyrogallol, which has long been popular on the Continent and in America. The sample which has been submitted for our inspection and trial could not qualitatively be excelled. It is a perfectly pure white flocculent production, readily dissolving into a clear

solution, and in actual use it has been found to produce negatives of ideal sparkle and density. We have never used a better pyro than Merck's, which, judging by the sample we have had in hand, should find great popularity among photographers.

#### THE "OPTIMUS" UNIVERSAL OUTFIT.

Manufactured by Perken, Son, & Rayment, Hatton-garden, E.C.

SURELY the "force of cheapness can no further go" when for seventy shillings such a well-made half-plate set of apparatus as that under notice may be obtained. To enumerate the articles comprising the set: the camera possesses leather bellows, rack-and-pinion focussing adjustment, and, as the diagram shows, a front and back swing, rising and falling front, mechanism for advancing the focussing screen quite near



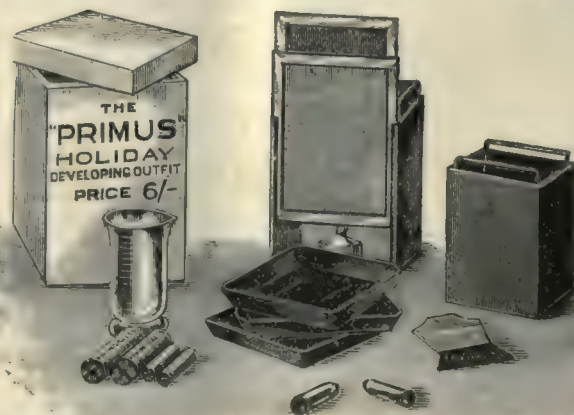
to the front when a short-focus lens is in use, and square reversing frame. The lens is of rapid rectilinear form, with iris diaphragms and with roller-blind shutter fitted. The tripod is compact, strong, and rigid.

One book-form double dark slide is supplied. The camera is exceedingly light and well made, and the covering and defining powers of the lens are so good that it alone may be said to be worth the price charged for the entire set, which is exceedingly good value for the money.

#### THE "PRIMUS" HOLIDAY DEVELOPING OUTFIT.

W. Butcher & Son, Blackheath.

THE tourist photographer will find this little outfit of the greatest utility in places where facilities for changing and developing are not procurable. The whole of the articles pack in the dark-room lamp, which is only a few inches square. Here is a list of the things which, in Messrs. Butcher's words, will enable the photographer to make his bedroom a



dark room: Japanned tin dark-room lamp with sliding fronts (ruby and canary), and special power night light; three japanned tin dishes; rack and siphon tank for washing negatives; four-ounce measure; two india-rubber finger stalls; developing and fixing cartridges and dishes. The articles make a compact little set well worth the money charged (6s. for quarter-plate and 8s. for whole-plate), and the convenience of the outfit is so great that we are sure many travelling photographers will be glad to avail themselves of it.



## THE WATKINS ACTINOMETER.

R. Field &amp; Co., 142, Suffolk-street, Birmingham.

This little instrument is designed to give the same results as the Watkins Exposure Meters; but it is pointed out that, being without slide rules, it is not so convenient, and the exposure requires a little mental calculation. The method of its use is as follows: The exposure is always a fraction of the actinometer time (found by testing the light), and this fraction is



found once for all by dividing the diaphragm number, which is stamped on the back of the actinometer, by the plate speed, which is given on the speed card. Thus, Ilford ordinary with  $f/22$  always requires  $\frac{3}{5}$ , or  $\frac{1}{2}$  near enough of the actinometer time. It takes the same refill as the '99 watch and is provided with quarter tint.

This useful little device should be widely appreciated by those to whom a little trouble is of no account when correctness of exposure is at stake.

## THE THORNTON-PICKARD ALBUM OF PRIZE PICTURES.

Published by Dawbarn &amp; Ward, 6, Farringdon-avenue, E.C. Price 6d.

In this album we have half-tone reproductions of forty-four of the prize pictures in the Thornton Pickard Company's Competition which was held last autumn. The pictures are of special interest in that each one is an example of instantaneous photography, Thornton-Pickard shutters having been used with the whole of the 2000 photographs that were submitted for competition. A list of prize-winners and some notes on the competition are given in the album, which is extremely well got up, and is decidedly worth preservation as a memento of an instructive and interesting competition.

## News and Notes.

PHOTOGRAPHIC CLUB.—May 10. Members' Open Night.

The dates fixed for the Annual Exhibition of the Hackney Photographic Society are as follows: November 16, 17, and 18.

REMOVAL.—Mr. J. LIZARS, of Belfast, writes: "Kindly note that I have removed to new premises, 8, Wellington-place, Belfast."

MR. H. S. FOSTER, chemist, of 14, Honor Hill-road, Honor Oak, S.E., informs us that he has provided a dark room for the use of amateurs.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, May 9, at 12, Hanover-square, at eight p.m. "The Photography of Colour," by E. Sanger Shepherd.

THE Second Annual Dinner of the Association of Plate-manufacturers, &c., was held on Wednesday evening last, May 3, at the Restaurant Frascati, Oxford-street, Mr. Frank Bishop being the Chairman.

MISS CATHERINE WOLFE BRUCE has, through Professor J. K. Rees, given 10,000 dollars to Columbia University, to be used for the measurement and discussion of astronomical photographs. Miss Bruce's gifts to the department of astronomy amount to 22,100 dollars.

SOME members of the Agricultural Society are organizing a Postal Club for the encouragement of bird and animal photography. The co-operation of photographer naturalists is invited. Address Mr. Charles Louis Hett, Hon. Secretary *pro tem.*, Springfield, Brigg.

In applying for advertisements from the Eastman Kodak Company in Berlin, the Editor of a German paper called *Photo Humor* has recently found the inconvenience resulting from the use of blackmailing methods. Starting with the allegation that "humorous photographic papers such as his were those which really increased the number of amateur photographers," he proceeded to ask "how many less Kodaks the firm would sell in the course of the year if he published in his paper uncompromising remarks about the Eastman Kodak?" He concluded by remarking that "it would be to the interests of the firm to advertise with him," and he offered sixty per cent. discount off his regular advertisement scale. The matter came under the notice of the Public Prosecutor, who, at the hearing of the case, affirmed that the action of the Editor was against the German law, and he demanded that the defendant should be punished accordingly. The Court returned the verdict that the defendant attempted to obtain money by unlawful means and to damage the reputation of other people, and he must therefore go to jail for two weeks, without the option of a fine, and also pay costs.

EXPLOSION IN A PHOTOGRAPHER'S STUDIO.—At a studio in Gosport on Monday night preparations were being made to take a photograph by the flashlight, when the magnesium powder exploded, shattering the apartment. The photographer, Mr. Harvey, was burned about the face and hands, and it is feared that he has lost the use of one eye.

THE South London Photographic Society's Whitsuntide Excursion is to Farnham, Surrey. The Leader is Mr. F. Goddard, and the headquarters are at the Surrey Arms, East-street. Trains and fares will be announced at the meeting to be held on May 15, but no special concessions can be expected beyond week-end tickets, this being Bank Holiday time. Arrangements have been made for the hire of a brake, to take members for a day's drive, for 1*l.* 10*s.*, if sufficient guarantees are forthcoming to secure same previously.

DEVELOPMENT WITH METOL AFTER FIXING.—Messrs. Fuerst Brothers send us the latest formula for this purpose: Take  $\frac{1}{2}$  ounce to 1 ounce of the following solution:—Metol, 120 grains; sulphite of sodium,  $2\frac{1}{2}$  ounces; water, 20 ounces. After an hour or two, according to the exposure given (the plates should be strongly over-exposed and all traces of hypo removed) the positive image appears full of detail, visible by reflected light but scarcely perceptible by transparent light. At the end of two hours the image has grown sufficiently to be intensified with mercury.

McKELLEN, LIMITED.—The first shareholders' meeting of this Company was held at the works, Mill-street, Long Millgate, on Thursday, April 27, the Chairman of the Company (Alderman R. Lovett Reade) in the chair. The Chairman stated that the Company was registered in January. Steps were immediately taken to obtain larger premises than those occupied by the late firm, and after considerable difficulty the present premises, with over two thousand feet of floor space, all on one floor, were secured at a moderate rental, with option of lease. The removal of machines, shifting engine, and fitting up of the same were effected by the middle of February, and production was at once commenced. Steady progress has been made, the output of each month since the beginning being a distinct advance on the predecessor. Substantial orders are in the books, and the men are fully employed on them. A stamping press has been set up, by which not only will the cost of the mechanical portion of the instruments be reduced, but the production in adequate quantities will be greatly facilitated. He said the Directors had spared neither time nor thought in their desire to give the Company a good start, and, considering the short time the Company had been in existence, the result has been exceptionally satisfactory. He concluded by saying that no effort would be spared on the part of the Directors to make the Company a great success, and by inviting shareholders at any time to call and inspect the works. In reply to a question put by a shareholder, the Chairman said that the Company had given up their retail shop in Bull's Head-yard for two reasons: first, that their undivided attention might be given to the manufacturing department; and, second, because they wished to secure the favour of the local dealers. A hearty vote of thanks to the Chairman closed the proceedings.

## Patent News.

THE following applications for Patents were made between April 17 and April 22, 1899:—

CINEMATOGRAPHS.—No. 8173. "Improvements in Cinematographs." A. J. JONES and L. JONES & Co., LIMITED.

CINEMATOGRAPH.—No. 8245. "Improvements in Apparatus for Taking and Displaying Photographs of Moving Objects." Complete specification. M. BARR.

CAMERAS.—No. 8362. "Improvements in or relating to Photographic Cameras." G. W. BASE.

CAMERAS.—No. 8455. "Improvements in Photographic Cameras." P. M. GRIMSHAW.

## Meetings of Societies.

## MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
5	Bradford Photo. Society .....	Fragments of Egyptian Discovery. Dr. Edwards.
8	Oxford Camera Club .....	Prize Slides.
9	Hackney .....	Concerning Exhibitions and Competitions. W. D. Welford.
9	Isle of Thanet .....	Lantern Evening: Prize Slides, 1898.
9	Leeds Photo. Society .....	On Some Exposures. Frank M. Sutcliffe.
9	Royal Photographic Society ..	The Photography of Colour. E. Sanger Shepherd.
10	Troydon Camera Club .....	The Comparison of Hand Cameras.
10	Photographic Club .....	Members' Open Night.
10	Southport .....	Platotype Printing. George Cross.
11	London and Provincial .....	Modern Photographic Lenses.
12	West London .....	Discussion on Out-door Work.—Arrangement of Summer Programme.
13	Ashton-under-Lyne .....	Excursion: Reddish Vale. Leader, William Turner.
13	Borough Polytechnic .....	Excursion: Around St. Paul's Cray. Leader, E. G. Hawgood.
13	Hackney .....	Excursion: Greenwich. Leader, F. W. Go-ling.
13	Liverpool Amateur .....	Excursion: Rossett. Leader, H. Holt.



## LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 27.—Mr. S. Herbert Fry in the chair.

MR. T. E. FRESHWATER showed a few interesting objects bearing upon the paper read by Mr. T. Bolas before the Royal Photographic Society on the blowing of glass diaphragms thin to Newton's "very-black" stage. He passed round one of the identical bulbs blown by Mr. Bolas, showing Newton's rings in a marked manner. The extremely thin state of the glass which attended the production of the black stage (asserted to be something like a twelfth of the thickness of gold leaf) was so difficult to get that Mr. Bolas had not produced more than one or two at the meeting, and Mr. Freshwater was unable to exhibit one. They were so fragile, too, at that extreme thinness that they were liable to disrupt at any moment. The method of blowing the diaphragms was to take two pieces of glass tube, mount them side by side, but slightly separated, and connect to one end of each tube a branched rubber tube, the other end of which is inserted in the mouth. The two free ends, which should be flush one with the other, are then held in the blowpipe flame until the open ends fall in and close. By blowing through the rubber pipe at this stage the ends may be distended into bulbs, which, as they expand, come into contact one with the other, producing a single bulb, supported on two stems, and divided internally into two chambers by a diaphragm formed by the wall of glass where the two bulbs merged together. The bulb is still kept in a plastic state and the internal air pressure increased by degrees. It is obvious that the air pressure is the same on each side of the diaphragm, entailing no unwholesome strain, but on the walls of the bulb itself the effect is to still further expand, and in expanding to stretch the diaphragm until it becomes of such thinness that Newton's rings and interference phenomena set in. The black stage, which is that when light falling upon it is practically extinguished, only just precedes the bursting stage, hence the difficulty of their production.

In the discussion which followed Mr. Bolas's demonstration Mr. JOHN SKEAR referred to the beautiful films which Mr. F. H. Glew had succeeded in making in a solid other than glass. It had been surmised that in glass only had such extremes of thinness been possible, but it appeared that Mr. Glew had produced similar results in varnish. Mr. Freshwater brought up three or four of these interesting films. Like the glass films, they exhibited a considerable amount of colour due to interference, but differed in the fact that the thinnest portions were near the edges instead of the centre. These films are made by dropping a minute quantity of varnish of a particular kind upon some water contained in a dish or saucer. The varnish flies over the surface of the water in a thin layer, which may be picked up by a metal ring or a circular wooden box. When dry, it shows the phenomena described. Newton's rings may be manifested in a variety of ways. One of the commonest is to press a lens of very slight convexity upon a plane surface of glass. Mr. Freshwater passed round a device especially to show this experiment.

The application of flexible films to spectroscopic photography was demonstrated by an admirable photograph of the spectrum of iron by the electric arc in comparison with the solar spectrum, made by Sir Norman Lockyer. It was of considerable length, and the film was employed to permit the full use of a large-curved Rowland grating. The Kodak Company sent the photograph for exhibition.

## PHOTOGRAPHIC CLUB.

APRIL 26.—Mr J. W. Zaehnsdorf in the chair.

MR. E. DOCKREE read his Affiliation Lecture on

## DEFECTS AND THEIR REMEDIES,

classifying the former into two kinds: (1) defects due to carelessness, and (2) defects due to want of knowledge on the part of the worker. Particular attention was given to such defects as distortion of outline, imperfect focussing, those due to defective apparatus and its injudicious use, under-exposure and over-exposure in interiors and exteriors, irregular development, and the many ills which attend development, fog of all sorts, marks, halation, and reversal, and many more.

In the discussion which ensued Mr. J. R. GOTZ referred to the lens shade, the use of which had been mentioned. He preferred a metal framework attached to the front of the camera, upon which the focussing cloth could be arranged to give the right amount of shade. The idea he got from a Glasgow photographer.

MR. F. A. BRIDGE and other speakers spoke of the disadvantage such a device would be under in a high wind, and pinned faith to the ordinary metallic shade attached to the lens, as being more solid.

MR. E. W. FOXLE said that Ross wide-angle doublets were always fitted with an adjustable sky flap, which could be placed at any angle, in any position with regard to the lens and light.

MR. J. NEBIT showed some examples of a method of correcting convergence of perpendiculars in a photograph. The idea was to copy the defective picture in the camera, the correction being secured by tilting the picture to an angle to be decided upon.

The prints were certainly improved by the copying, but the question arose that the height of the perpendiculars was shortened, and the image altered consequently in perspective and in size. It was represented that the plate also should be tilted if one wished to avoid the dwarfing or stunting of the vertical lines.

A cordial vote of thanks was passed to Mr. Dockree for his personal attendance, a course which much enhances the value of a lecture compared with its reading by another.

**Croydon Camera Club**—An audience of not less than forty assembled on Wednesday, April 26, to witness Mr. JAMES PACKHAM, F.R.P.S., demonstrate

## HOW OZOTYPE IS WORKED,

and to hear his explanations of this somewhat remarkable new printing process. In the course of a few introductory remarks the PRESIDENT congratulated the Club on its being the first photographic society to follow up Mr.

Manly's announcement at the Royal Photographic Society by the demonstration to be given by Mr. Packham of this probably most useful process. For this they were deeply indebted to Mr. Packham for his enterprise and ability. The lecture and demonstration proved to fully warrant the interest evinced by the large attendance. The lecturer began by giving an illuminative description of the process, from which it would appear that the picture or print is produced by light forming an allotropic oxygen image. How this is seized on by the manganous salt with which the paper is coated, how the acid bath acts on the carbon tissue, and why hydroquinone is used were clearly explained. Without following Mr. Packham through all his manipulations we may say that the *modus operandi* is much as follows: The paper is brushed over with potassium bichromate and a manganous salt in solution; it is dried, printed, washed, and squeezed on to carbon tissue, which is then developed in warm water, as is the usual carbon print. The printed image is a visible one, so that one can judge by ocular inspection how the picture is progressing and how much additional light action is called for, which in an ordinary carbon print is not possible. Mr. Packham handed round prints in various stages, and also developed some which he had prepared from negatives of his own. A large number of prints made by Mr. Thomas Manly were also shown, several of them being characterised by much beauty of effect and in other respects illustrative of what might be done by the new process. For the loaning of the above and for otherwise facilitating the preparation of the demonstration the audience's thanks were tendered to Mr. Manly. The discussion was participated in by Messrs. MACLEAN, ROGERS, BEN. EDWARDS, KOUGH, S. H. WHITTEN, HAWKINS, and WATSON. Asked by the President as to the percentage of failures Mr. Packham had met with, he answered "he had met with none." Mr. Rogers had, however, found blemishes arise through dark spots, some as large as sixpenny pieces, which had shown themselves on his prints. These were inexplicable, except on the theory that there was some chemical impurity in the paper used which set up an oxidising action; but in one case the paper was single transfer paper used in ordinary carbon work, which is presumably free from casual impurity.

**North Middlesex Photographic Society.**—April 24, Mr. R. B. LODGE gave a lecture on,

## WILD-BIRD PHOTOGRAPHY,

illustrated by lantern Slides. All the species shown were native to this country, but a few are extinct now or nearly so; these latter were photographed abroad, chiefly in Andalusia in Spain and in the marshes of Holland. Nearly all the examples were taken with a tele-photo lens on a heavy camera. The difficulties he had to contend against were very great. To get within proper distance, sometimes two or three yards, it was necessary to envelop himself in a green-baize sack, with a cover for the camera of the same material, and to lie for hours in a suitable spot with the camera focussed on the nest, and to wait until the birds came back or had got accustomed to the stranger near them. The birds themselves perched on branches or sitting on the nest, the nest themselves with the young birds waiting open-mouthed for worms and grubs were all shown. In the case of aquatic birds standing for hours in waders with water up to the middle is often necessary. The failures in this branch of photography were very great. Wind was a great source of trouble, also the birds moving and various other causes.

**Leeds Camera Club.**—April 27.—Annual Meeting, Mr. R. Bourke (the Vice-President) taking the chair.—The retiring officers and Committee of the Club, in their annual report, congratulated the members on a most successful year. The increase in the membership during the whole year has been constant, about a hundred having been added to the roll since the reconstruction in April 1898. The Club was invited to join the Yorkshire Union during the past year, but by a unanimous vote it was decided not to do so, as the Club could gain no advantage from participating in such a scheme. Regarding the future, the Committee desired to point out that in the syllabus arranged for the coming session there will be found the names of the leading workers of Great Britain, and that probably no photographic society has such a fine list of lecturers. It is proposed in the coming session to make special arrangements for the encouragement of the attendance of ladies, and the Committee reminded members that ladies are eligible for election as members. The report was unanimously adopted, and the election of the new Committee and officers took place. On the counting of the votes, Mr. R. Bourke (the Vice-President) declared Mr. W. J. Warren re-elected as President; Messrs. C. L. Rogers, Major Norwood, A. C. Homburg, and J. Charters Birch were elected Vice-Presidents; Messrs. Skilbeck, Barnes, Elif, Emmott, Morfett, Powell, and Paley were elected for the Committee; and the other officers were chosen as follows:—Mr. F. Rust, Hon. Treasurer; Mr. John H. Gash, Hon. Secretary; and Mr. R. Bourke, Lanternist, with Mr. C. Grayson as his assistant.

## FORTHCOMING EXHIBITION.

1899.

May 5-13 ..... National Trades and Industrial Exhibition, Bingley Hall, Birmingham. Manager, Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.

**LIQUID HYDROGEN.**—At the Annual Meeting of the members of the Royal Institution, held on May 1, Professor Dewar made a brief reference to the recent scientific work of the Royal Institution, and announced that, having obtained liquid hydrogen in considerable quantity, he had directly determined its temperature and other physical constants, finding its boiling point to be much lower than was previously supposed, namely, 20° above the zero of absolute temperature, and attaining by exhaustion a temperature of only 15° absolute. Pending the discovery in quantity of some yet lighter gas, there was no means in sight of bridging this gap and reaching the zero point. He also took occasion to warn the public against absurd exaggerations as to the properties of liquid air, which, originating in America, found their way into popular magazines in this country.



## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* We do not undertake responsibility for the opinions expressed by our correspondents.

### KEEPING QUALITIES OF PLATES.

To the Editors.

GENTLEMEN,—As a contrast to the experience of your correspondent in the issue of April 14, it may interest your readers to know that, of several dozens of plates taken out to India, in January 1898, for the total eclipse of the sun, not one was found unsatisfactory on account of any deterioration. Of course, the actual plates exposed during the eclipse were developed on the spot, but the remaining plates which had not been used were brought back here, without any such special care as was taken when they went out. That is now fifteen months ago, yet I used several of these remaining plates a few days ago (size 16×6 inches), and found them still in perfect condition. The plates were Lumière, Series A, Extra Rapid, and Edwards's Snap shot Isochromatic (Anti-halo). So far as I could judge, the rapidity of the plates was scarcely different to that of the fresh article.—I am, yours, &c.,

CHARLES P. BUTLER.

Royal College of Science, South Kensington, London, S.W.,

April 22, 1899.

### RE ANOTHER SECRET PROCESS.

To the Editors.

GENTLEMEN,—With reference to the above, we would beg to say that recently a man called upon us with specimens of bas-relief portraiture, and offered us the sole agency for the district. When we asked him for further particulars, he stated that it was a very simple process, and he would teach us for a fee of one guinea, upon which we declined with thanks. He gave no name, but we gathered that he came from Brighton.—We are, yours, &c.,

A. WILDMAN & Co.

The Maybury Studio, Maybury-road, Woking, April 28, 1899.

### PHOTOGRAPHY AT FUNERALS.

To the Editors.

GENTLEMEN,—Having read several comments in your excellent paper relative to photography and funerals, perhaps it might interest your readers to know that there are, in this, as in most other cases, two sides to the question, for it was only two or three months ago that I received a commission to be at the church lych gate in order to photograph a funeral, with choir and clergy. This was from one of the chief mourners. The proceeding to my mind was so very painful that I declined the offer, and I think most photographers would have done the same.—I am, yours, &c.,

E. H. DUNMORE.

Downton, April 28, 1899.

### SHUTTER-SPEED TESTING MACHINE AT THE CAMERA CLUB.

To the Editors.

GENTLEMEN,—Probably, owing to some misunderstanding, your report of the above practically states that the speed-testing machine shown at the above Club was the invention of Dr Lindsay Johnson. This, we feel sure, the gentleman named would not for one moment suggest. Whilst at our works he saw and much admired our excellent system of testing the speeds of shutter, and requested us to make him a couple of the instruments. This we have done, and are pleased to find that, with his well-known generosity, he has presented one of them to the Royal Photographic Society, and the other to the Camera Club.

We shall at all times be pleased to supply similar machines to others requiring them, yours, &c.,

ADAMS & Co.

26, Charing Cross-road, W.C.

### A SOCIETY FOR PHOTOGRAPHIC PRINTERS.

To the Editors.

GENTLEMEN,—I don't know that I can do better than thank Mr. Randall for his remarks upon my letter, as one can easily see that he has the whole thing in a "nutshell." He (Mr. Randall) first points out "that our trade is a mere infant when compared with carpentry, plumbing, and bricklaying, and consequently the distinctions between its various members have not yet reached so definite and fixed a boundary

as those between the members of the building trade." Exactly; but is that any reason at all why "our members" should not make a start? Why cannot "our members" (the photographic printers) form their section? I don't think for one minute Mr. Randall wishes to throw "cold water" on a scheme which probably is the only way, under present conditions, to unionise photographic printers. I shall await with interest for your correspondent's reply.

Again, he says, "The want of knowledge concerning trade unionism displayed by the average assistant is well put by Mr. Willatt, viz., 'I must be free to take what wage I please,' assuming wrongly that trade unionism destroys such a liberty." Here Mr. Randall points out that what trade unionism does do is to prevent the assistant accepting twenty shillings if twenty-five shillings be the union rate of wage. Quite right, so far, but still the assistant will say, "I must be free to take what wage I please." There is competition and fighting for berths, and the assistant can't stand out of a berth because he cannot get twenty-five shillings; he says again, "Half a loaf is better than none." Now, if Mr. Randall would show some better means of meeting the case than a photographic printers' union, I should be extremely glad. Dear sirs, I honestly think under present circumstances that it is an impossibility to get photographic printers to join the National Amalgamated Union; but let them have a union of their own, and then amalgamation will in due course follow. I also feel assured of the fact that the sooner photographic printers join hands, and agree as to what a printer's fair wage is, the better, and the sooner they have some means of a knowledge of certain rules which seem to predominate with certain firms the better also. "Fewer unions and more union." Yes—but let us not forget that it is the little tributaries (little rivulets) that form the great current bounding on towards the everlasting sea.—I am, yours, &c.,

F. G. WILLATT.

101a, Fulham Palace-road, Hammersmith, W.

### NORWAY IN JUNE.

To the Editors.

GENTLEMEN,—I expect to spend about three weeks in Norway in June, and wondered if you or any of your readers could give me a hint or two in reference to the photographic work there.—I am, yours, &c.,

NORWAY.

[Will some reader oblige our correspondent with a few hints?—Eds.]

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2A, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

W. Lander, 1, Regent's-parade, Shanklin, I.W.—Two photographs of Royal Museum, Carrisbrook, I.W.

A. M. Riddle, 4, Strathaven-terrace, Oban.—Photograph of "Free Church Convention" group, photographed at Oban, Argyllshire, N.B., on April 12, 1899.

L. WEST.—No, it is not the case.

T. ROBEAR.—The address is Avenue-road, Shepherd's Bush.

O. K.—We should not consider such services worth more than 1*l.* or 1*l.* 5*s.* a week at the outside.

H. J. HILLHOUSE.—Mercury is occasionally recommended to be added, but we believe the Company supply a special solution for the purpose, which perhaps it would be best for you to procure.

COCKLED CELLULOID FILM.—T. DEACON. The trouble was caused by your drying the films in spirit. Celluloid is partially, or wholly soluble in strong spirit, and should not therefore be used for celluloid films.

ALBUMEN AND GELATINE.—You are under a misapprehension; the two can be mixed in any proportion, but the mixture must not be heated beyond the coagulation point of the albumen, otherwise it will coagulate, and thus separate as a flocculent mass.

T. W. BARBER.—We doubt if the tone desired is producible in the way described. Alpha paper and the new gaslight development papers, such as Velox, Dekko, &c., might, however, answer your purpose, the colour being directly produced by exposure and development.

LENS QUERY.—F. BEALE. If the lens be a symmetrical one, it matters not which is used as a single one; but, whichever is used, the convex side should be next the ground glass, and the stop next the concave side. All rectilinear lenses, however, are not symmetrical, though the majority of the modern ones are.



**MARKINGS ON PRINTS.**—H. AYLWARD writes: "Will you kindly inform me what the marks on enclosed prints can be? It happens on a few in a batch only. Every care is taken in all stages of the process."—The marks are due to particles of foreign matter coming in contact with the prints while they are wet. What the foreign matter may be, we cannot say. Particles of pyrogallie acid, or other reducing agents, would produce similar spots.

**STUDIO.**—R. MINNA. The only advantage of a studio with a north light is that it is easy to work and requires less skill on the part of the photographer; but a skilful photographer will get equally as good pictures in a studio with any other aspect. The results depend upon the artist rather than the aspect of the studio, therefore do not attribute the whole of the success of —'s pictures to the fact that his studio is lighted from the north; to do so would be a fallacy.

**MOUNTING PRINTS WITHOUT COCKLING.**—C. C. WRIGHT says: "I have to mount some photographs in an album the leaves of which are of thin card."—There is considerable difficulty in mounting prints under these conditions without their cockling. The best way is to take the leaves out of the album, and then mount, and roll the prints in the usual way. Then rebind the album. If this cannot be done, then use the mountant given on p. 1061 of the ALMANAC.

**COPYRIGHT.**—F. T. BLACKBURN says: "I have taken a photograph of the Salterton Town Band, and the Bandmaster wrote me, giving me permission, on behalf of his men, to copyright same, and your publishers kindly undertook registration for me. I was not paid for photographing them, but have since sold copies to the members of the band. I have every reason to believe that it has been infringed. Have I a clear case?"—In reply: Yes, you have an absolutely clear case, and can impose your own terms.

**OPPOSITION.**—B. & Co. Unless you have an agreement to the contrary, there is no reason why the late operator and manager of the branch should not open a business a few doors off, and so "do your business an injury." The fact that he was five years in your employ, and knew all the customers, goes for nothing. He can also say on his circulars and on his shop front so many years with you, provided your name is not used in such a way as to imply that the business is yours, or is connected with yours.

**GROTESQUE PORTRAITS.**—GROTESQUE says: "Could you please tell me how the grotesque portraits are produced, such as a very large head (a true portrait) on a small body, such as Highlander dancing, or man riding donkey, &c.; also where I can get materials from for their production?"—There are different ways of producing such portraits, such as double printing, placing sketches before the figure when the portrait is taken, &c. If we mistake not, Fallowfield's supply the necessary appliances. Write them.

**NEW USE FOR OLD PYRO BOTTLES.**—A PHOTOGRAPHER'S DAUGHTER writes: "Would you kindly inform me if there would be anything deleterious to health if I were to use the empty blue bottles and corks, used by Schering's for storing pyrogallie acid, for bottling fruit, if they were thoroughly washed and cleaned? They are a most convenient size for the purpose, but I thought I had better inquire before using them."—In reply: Wash the bottles and corks copiously with hot water and you need have no fear of any ill effects.

**CRYSTALLISATION OF DEVELOPING SOLUTION.**—METOL says: "Will you tell me the cause of the following developer crystallising when cold:—Metol, 40 grammes; sulphite of soda, 120 grammes; hydroquinone, 45 grammes; water, 8 ounces. I dissolved metol in the 8-ounce hot water, then thoroughly dissolved the sulphite, then added the hydroquinone?"—If the solution were made in the order mentioned, there should be no crystallisation when cold. We have never had it behave so ourselves. Possibly there was some error in the order of mixing.

**RESIDUES.**—S. R. writes, complaining that he did not receive nearly the amount he expected for some residues he sent to a well-known London house to be reduced. That is very likely, because, possibly, he expected too much. Residues, nowadays, contain but very little silver compared with what they used to do when highly salted and strongly sensitised albumen paper was in vogue. Modern gelatine papers contain but little silver to be recovered, while the baryta coating adds very materially to the weight of the ashes. Further, the value of the silver, when recovered, is but half that of what it at one time was.

**STUDIO GLAZING, &c.**—J. H. C. says: "I should be glad if you would kindly answer the following questions:—1. I have reasons for wishing to glaze the side light of my studio with ground or fluted glass; should I be at any disadvantage in doing so? I have about 3 x 20 feet of plain glass for top light. Is there any special glass you could recommend (other than plain) for the side light? 2. What is the best means of preventing or removing the objectionable pyro stains from the finger nails?"—1. There would be no disadvantage. 2. On p. 972 of the ALMANAC are receipts for removing pyro stains from the fingers. But the stains are more difficult of removal from the nails, unless some abrading material, such as pumice powder, be used in addition.

**FERROTYPES.**—R. PRYOR says: "I am a photographer and a regular reader of your paper. I intend opening a tent on a 'public amusement ground' for ferrotypes. Have got Fallowfield's lists, but I don't know how to work the plates. Can you give me the following information, which will greatly oblige? What are the developing constituents most suitable? How are the pictures reversed? Do you know of any book on the subject? I am going in for dry-plate ferrotypes."—The most suitable developer is that supplied specially for the plates. If you did not receive the formula with the plates, write for it. For the moment we do not remember the one issued for these plates. Ferrotypes are all reversed, and remain so. Fallowfield publishes a work on ferrotypes.

**CERAMIC PHOTOGRAPHY.** A. JOHNSTONE.—There are no patents that will interfere with your working either the powder or the substitution methods of ceramic photography.

**WET-PLATE WORK.**—F. B. says: "I should be greatly obliged if you can inform me if there is much opening for a good wet-collodion worker, as I have been wondering lately if this particular branch of photography is worth following up. I am at present working as a wet-collodion lantern-slide maker, but am desirous of following the process further. Is there much opportunity of getting into process work? If you can tell me through your valuable JOURNAL, I shall be greatly obliged."—The working of the wet-collodion process is now chiefly confined to negatives for process blocks and making enlarged negatives for carbon printing. If you are a skilful worker, we think you would find employment; but, of course, the process is but comparatively little worked now.

**CYANIDE FUMES.**—S. WOODS asks: "Is there any way of doing away with the injurious fumes from cyanide of potassium when used for fixing wet-collodion negatives or transparencies? Are they injurious in a well-ventilated dark room?"—We know many who have [worked with the cyanide for years, both in photography and in electro-plating, without their suffering any ill effect. With some, however, it at times causes a headache and nausea, but rarely if the room is well ventilated. Often there are far more fumes evolved than there need be, owing to the cyanide solution being poured off the plate into the sink while it contains some remains of the acid developer. The acid then causes an evolution of cyanide fumes. Better develop over one sink and fix over another, so as to keep the two solutions apart. Then there will be little of the "injurious" fumes given off.

**AN ATTIC AS STUDIO.**—C. GORHAM says: "I have had an attic over my office made up into a sort of studio for my own private purposes, having two semi-skylights, and I enclose herein two proofs of my first attempt—one a rough proof off negative before retouching, and the other after retouching. Now, I want to ask you to be kind enough to tell me whether the light arrangement is about right, for I had no screens, shading fans, &c.; all I had was a grey background of my own painting. I am aware the heat in this subject caused the shade; could this have been obviated by light reflections?"—The portrait is flat owing to its being lighted entirely from the front. A much better effect would be got by working across the studio, so that the sitter be illumined by a side light. The shadows can be easily softened by reflectors. Fairly good portraits can be obtained in the room.

**SPOTS ON PRINTS.**—THE MAJOR says: "I should be much obliged if you could kindly give me your opinion regarding these small brown specks on enclosed print. I cannot understand the cause, as I am very particular to adhere to instructions regarding the toning, &c., of the paper, and do what I will I cannot get a perfect batch. Sometimes I have only one or two prints, and at others about a quarter of the batch spoil like enclosed. It is only quite recently this has happened. Do you think it is through the water containing rust, or is it in the chemicals? To me it seems to be rust if scraped with a knife. I should be much obliged to receive your opinion on the matter, as it is causing me much extra trouble, and is very annoying."—If the water contains particles of iron rust, the spots are fully accounted for. We see no reason for suspecting the chemicals. Try the effect of using water from another source.

**SPOTS ON PRINTS.**—SPOTTED PRINT says: "We are sending you some prints which, you will notice, are to an extent covered with small black spots. We have taken every precaution in the washing, toning, and fixing processes. We find that these spots always appear on the prints during the first washing. We have put the cause down to particles of iron in the water. Could you suggest any way of filtering the water as it comes from the tap? Do you know of any reliable filter on the market, and where it could be obtained? We have tried muslin and cotton-wool tied on the tap, but have not found it answer. We may mention that we have used two different brands of paper with the same result."—In reply: Particles of iron in the water would cause similar spots, and we should think that cotton-wool in muslin or flannel would keep them back if properly secured over the tap. Maignen's Filtré Rapide and the Birkenfeld filters are both good. They may be procured through any ironmonger.

**AN ETCHING QUESTION.**—J. BENTLEY says: "In your issue of January 30, 1890, there appears an article on Plate Etching, and towards the bottom of first column appears: 'Having some recollection of the facility with which fine lines could be drawn by the needle point upon glass which had received a coating of silver, so we silvered a glass, &c., and impressed image by means analogous to the Daguerreotype.' Now, I wish to know how this image is got by that process, of which I am ignorant as regards working details, and whether the same is applicable to copper for engraving or etching purposes, as a man in our district does work for engravers on copper, and the surface of plate is white and the image is black? Could you enlighten me on this, I should deem it a favour. I thank you for answer re Studio, in which I am doing good work, though facing west. I have covered the glass by V. Blanchard's method, which appeared in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1897 or 1898, with tissue paper soaked in linseed oil, and it makes a splendid ground glass, for which I may say I am thankful, and it may be of use to others."—In reply: To describe the working details of the Daguerreotype process would take up several pages of the JOURNAL. We must therefore refer our correspondent to some of the earlier works on photography, Hunt's, for example. The Daguerreotype plate is a copper plate, silvered on its surface. We cannot say how the plates referred to are produced, but, if one was sent for us to see, we could probably tell how it was done.



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## EX CATHEDRA.

THE Royal Commission for the Paris Exposition of 1900 has entered into communication with the Camera Club and the Royal Photographic Society with a view of delegating to a Joint Committee of these bodies the task of making a representative collection of British pictorial work to be sent to Paris for display at next year's great Exhibition. It is to be hoped that such care will be exercised in the appointment of the Joint Committee as will ensure that the photographs to be forwarded to Paris will be drawn from all available sources in Great Britain where good or representative photographic work may be found. The proceedings of the Joint Committee will be followed with a great deal of interest, and the method of selection adopted will, no doubt, be narrowly scrutinised. If any attempt be made by a certain small knot of persons to impose their own peculiar views as regards the selection of the photographs, a keen resistance to such a proceeding may be anticipated.

THE Second Annual Dinner of the Association of Plate and Paper-manufacturers, which was held on Wednesday in last week at the Restaurant Frascati, was made the occasion of the presence, under the genial chairmanship of Mr. Frank Blahop, of a fully representative gathering of the members of the Association. The company with the guests, which included the whole of the press and some other gentlemen, numbered about forty, and the vice-chair was occupied by Mr. John Howson. The festivity was a thoroughly enjoyable and harmonious one, and on these grounds alone it is permissible to hope that it will become an annual institution with the members of the Association.

\* \* \*

THE following firms were represented at the dinner: Britannia Works Company, Marion & Co., Kodak Limited, Wellington & Ward, Morgan & Kidd, Imperial Dry Plate Company, R. W. Thomas & Co., Paget Prize Plate Company, Mawson & Swan, Cadett & Neall, Elliott & Son, and others. The Secretary of the Association was also present. There were very few speeches, the principal one being made by Mr. Howson in response to the toast of the Association. In giving a brief history of the Association during the two years of its existence, Mr. Howson dismissed the term "ring" which had been applied to it as an erroneous one, pointing out that the regulation of the retail prices of sensitive plates and papers could not properly merit an appellation usually held to have a different meaning. It was gathered from Mr. Howson's remarks that the utmost success had attended the Association's objects, with which dealers and others were in thorough sympathy. The toast list also included "the Chairman," "the Vice-Chairman," and "the Guests," and a notable evening in the annals of British photographic trade and manufacture terminated with the singing of "Auld lang syne."

\* \* \*

THE interest excited in the election of Judges for next autumn's Royal Photographic Society's Exhibition appears to be exceedingly keen. A considerable number of members have agreed upon a voting list, which is in circulation, and in all probability the result will be an indication of the wishes of the large majority of members in this very important respect. Ballot papers should be sent in by the 31st inst.



DURING their stay at the Villa Liserb, Cimiez, Her Majesty the Queen and the Royal Princesses gave Mr. A. L. Henderson twelve sittings for their photographs, the resulting negatives being highly approved. By command of the Queen, Mr. Henderson also photographed the ceremony of the opening of the Victoria Bridge. On Wednesday, May 3, he was summoned to the Austrian Consulate and presented on behalf of the Emperor with a very handsome diamond and ruby breast-pin in recognition of his skill in photographing the unveiling of a monument to the late Empress Elizabeth. We congratulate Mr. Henderson on the honours of which he was made the recipient.

\* \* \*

LORD CRAWFORD presided at the Annual Dinner of the Camera Club, which was held in the large room of the Club-house, Charing Cross-road, on Thursday evening, May 4. There was an attendance of about ninety members and friends, amongst whom were Professor Unwin, Mr. Lyonel Clark, Mr. George Davison, Mr. Payne Jennings, Mr. E. J. Humphery, the Rev. C. J. Moncrieff Smyth, Mr. Seyton Scott, Mr. E. Sanger Shepherd, Mr. Horace Willmer, Mr. Reginald Craigie, Mr. J. Wallace Godfrey (Hon. Sec.), Mr. W. Asbury Greene, Mr. Thomas Bedding, Mr. H. Snowden Ward, Mr. Percy Lund, Mr. R. Child Bayley, Mr. William Croke (President-elect Photographs Convention of the United Kingdom), Mr. H. Walter Barnett, Mr. R. Freer Austin, Colonel Marshall, Major Levy, Colonel Saunders, Mr. William Nicholl, the Rev. Father White, and many other prominent members of the Club.

\* \* \*

THE after-dinner entertainment was extremely amusing, being provided by some gifted "Savages." The toast list was short, merely including "The Queen and Prince of Wales," "The Club," "The Press," and "The Chairman." Following Lord Crawford's lead, some of the speakers indulged in the hope that the growth in prosperity of the Club would one day necessitate the acquisition of much larger premises than it at present occupies. It also appeared, from the remarks that were made by the various speakers, that the efforts of the Executive to cater for the intellectual and other needs of the members were highly appreciated by the latter, and an evening of great enjoyment terminated with the general hope that a prosperous future awaited the Camera Club.

\* \* \*

LAST week we mentioned that the British Pictorial Section of the Florence International Photographic Exhibition had met with great appreciation at the hands of the visitors. The sincerity of this appreciation is evidenced by the fact that on the opening day ten per cent. of the contributed British pictures were sold, including productions by Messrs. Ralph Robinson, Thomas Manley, W. S. Aston, E. E. Barron, Henry E. Davis, Charles Job, Karl Greger, W. J. Warren, H. V. Hyde, E. Calland, and J. Craig Annan. Further sales have since taken place. The photographers whose names we have mentioned should be proud of the knowledge that their works have gone into the possession of Florentine art lovers.

\* \* \*

MR. ALFRED STIEGLITZ, of New York, kindly sends us an invitation which time and distance oblige us regretfully to pass over. It is to inspect a one-man show of his photographs that are on view at the New York Camera Club until the 15th

instant. From the tastefully produced catalogue to which Mr. Joseph T. Keiley contributes a sympathetic eulogy of pictorial photography and the prominent part played in its progress by Mr. Stieglitz during the last twelve years, we gather that the Exhibition consists of nearly ninety photographs. It includes most, if not all, the many very beautiful studies which Mr. Stieglitz has from time to time contributed to the English exhibitions. To each entry in the catalogue brief details of the printing process employed by Mr. Stieglitz and descriptive notes upon the history and characteristics of his photographs are added. Mr. Stieglitz, we perceive, owes his first medal to Dr. Emerson. From long familiarity with the style and qualities of Mr. Stieglitz's work we are confident that visitors to his exhibition will be charmed by the sure but tender touch the author puts in all his productions, and we only regret that we have not the chance of seeing the collection.

## COLOUR FACTS AND FALLACIES.

### I.

FOR the third time in less than three months we have found it desirable to advert to the theme which is indicated by the heading of this article. The fascination that clings to the subject of colour photography is not greater than the interest which attaches to those who make that branch of work the object of special investigation. The assailants of one of the greatest problems of our time command an amount of popular attention which is denied to the majority of ordinary men, from whom they have separated themselves in the search after the philosopher's stone of photography; and it cannot be said that the distinctive public recognition which has been vouchsafed to the latest gentleman in whose colour-photography labours the world has been invited to interest itself falls short of the requirements of the case. Mr. J. W. Bennetto—the gentleman in question—could not have been made more of by some of the newspapers if he had been a billiard champion, a successful jockey, or a victorious pugilist. It may be worth while examining how far the greatness that has been thrust upon Mr. Bennetto is really deserved, and upon what evidence his claim to have discovered the philosopher's stone above alluded to should be allowed to rely.

For reasons that will subsequently appear we are not called upon to notice the defence of the Bennetto three-colour process which was printed in a photographic publication last week. The source and object of those observations absolve us from any obligation to pay the least attention to them. Moreover, we can dismiss as absurd the charge, which was made, of "injustice" towards Mr. Bennetto's process. If three years ago that gentleman had contented himself by claiming to have worked out simply a development of the three-colour process, the criticisms we have felt it our duty to pass on his words and work would not have been called for, and his process to-day would have needed no apology or defence at the hands of sympathetic persons whose common sense is obscured by their touching anxiety for justice.

The uncompromising attitude of scepticism which THE BRITISH JOURNAL OF PHOTOGRAPHY has always taken up towards Mr. Bennetto's claims to have discovered photography in natural colours—his own words were: "I claim to have solved the problem"—was dictated by a reasonable doubt as to whether Mr. Bennetto had really made any material original discovery in colour photography, and we want no other or stronger justi-



fication for that attitude than the admission which has been made that Mr. Bennetto's much-vaunted solution of the problem is merely a development of the three-colour process, the publication of which some months ago created throughout the photographic world what the editor of our contemporary, *The Optician*, so well described as "a feeling of painful surprise."

We are aware that Mr. Bennetto and his doings are favourite topics with the readers of this JOURNAL; and we are confident of the sympathy of thousands in our efforts and determination to keep him off a pedestal on which he has no right to stand. It is, of course, needless to add that we have no hidden motive in this course, although it might appear that the vigour which we have endeavoured to impart into our references to Mr. Bennetto's proceedings laid us open to the sinister charge of personal feeling. Such, however, is not the case.

But, if we have been sceptical of the tenability or admissibility of Mr. Bennetto's claims to have "gone one better" than Ives, Lippmann, and Joly in colour photography, we have been at considerable pains to assist Mr. Bennetto in securing opportunities for taking the opinions of representative bodies of photographers on those claims. Out of the mass of Bennetto literature we have preserved, in view of possible eventualities, we take the following letter, which Mr. Bennetto addressed to us personally on August 18, 1896, in acknowledgment of a suggestion which we made to him: "In reply to your suggestion that I should send a picture to that excellent Society, the Royal Photographic, I fear I should not be able to do so until after my exhibition here; but I should be quite willing to come up and exhibit, say, thirty or more slides of various subjects before the members of the Royal Society if desired to do so, although I have not the honour of being a member, and on that occasion I would give you every opportunity of seeing many others as well (stereoscopic)," &c.

We suppose Mr. Bennetto's exhibition (at Newquay) has still to be held, for he has not yet appeared at the Royal, and we have not had the opportunity of seeing the slides, stereoscopic or monocular. But, determined to exert all our power to induce Mr. Bennetto to submit his work for the inspection and criticism of the photographic public, we expressly prepared another opportunity for him to do so. The arrangements for the papers and demonstrations at the Great Yarmouth meeting of the Photographic Convention of the United Kingdom were partly in our hands, and we wrote to Mr. Bennetto, asking him to send some specimens of his work for exhibition. It will be remembered that the notorious Chasagne process was demonstrated at Great Yarmouth.

Mr. Bennetto replied, on May 20, 1897: "If it is possible, I will send an example or examples of my photographs in colours to the Convention; but at the present time I am not able to speak very positively upon this point, and for the following reason: I am at the present time working out something else in connexion with photography of a very important character, and, as I am anxious to complete this as soon as possible (for important reasons), I have been compelled to put my new method of colour photography aside, and I am not in a position to say if I shall have any specimens of my new method ready in time; but, if I have, I shall be very pleased to send them. I do not intend to exhibit any more examples by my old method, as I have made a great improvement, the working details of which, however, are not quite complete, for the reasons given."

The specimens were not shown at the Convention, and thus

for a second time we were foiled in the attempt to obtain for those interested the sight of a few examples by one of apparently several processes of colour photography which Mr. Bennetto seems to have worked out only to abandon. At any rate, it appears plain, on Mr. Bennetto's own showing, that between August, 1896, and May, 1897, he had given up an "old" method and invented a "new" one.

Whether it was this "new" method or a newer one which Mr. Bennetto, when we had the pleasure of meeting him in London during the month of February, 1898, voluntarily promised to demonstrate to us in the coming spring, adding that we should be the very first to witness the demonstration, we cannot say, for, although considerably more than a year has elapsed, Mr. Bennetto has failed to keep his promise.

We must ask the forgiveness of the reader for imparting into an article of this nature so many details of a personal kind; but we have felt it a duty which we owed ourselves to make it plain that, while we have never faltered in our attitude of scepticism towards Mr. Bennetto's claims, we sought every opportunity of giving him the chance of destroying our scepticism by advancing some evidence in support of his pretensions. But, even if he had redeemed his promise, and allowed us to witness his method of working the "development of the three-colour process," the result has shown that the secret was not a particularly valuable one.

So much for the purely personal aspect of the matter. The ridiculous suggestion that we have been deliberately hasty and unjust towards a process which has turned out to be something altogether different from what it was claimed to be having been disposed of, we conclude with the promise to give further extracts from our stock of Bennetto literature next week.

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**Spring and Spring Photography.**—One need not be reminded that spring is now with us, or that spring effects in photography can only at be had this season of the year. But it may be well to remind some of our readers, as we have done in some previous years, that certain pictures are available now that are not to be had at any other time. For example, churches, abbeys, ruins, &c., are frequently so surrounded by trees that they cannot be seen, at a photographable distance, when the foliage is on. To take such views when the trees are absolutely bare, the naked boughs and twigs convey a dismal wintry and unpleasant effect; but, if the same subject be taken when the leaves are just budding forth, the effect is entirely different, though the main object may be as fully depicted as when the trees are perfectly bare of foliage, and therefore make far more pleasing pictures. Hence our reminder that such pictures can only be obtained just now.

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**Methylated Spirit.**—Perhaps it scarcely need be stated that the so-called methylated spirit is ordinary alcohol, to which has been added some foreign substance to give it such an unpleasant odour and nauseating taste as to render it impossible to use as a potable liquid. For many years methylic alcohol, otherwise known as pyroligneous spirit or wood naphtha, was used for the purpose, hence the term "methylated." It was, however, found that, nauseous to the taste as this mixture was, it was yet used freely as an intoxicant, and wood spirit was discarded for a mineral oil which, on account of its precipitation upon the addition of water, is objectionable for photographic use. It is true that the Inland Revenue, under certain precautions, allow the purchase of the old kind of duty-free spirit, but only in large quantities; hence many less photographically objectionable materials have been proposed as substitutes in this "denaturalising" process. The most recent suggestion is the employment of the oils produced in the manufacture of acetone



Dr. Lang, a Swiss chemist, having patented their use for the purpose. In the course of an exhaustive article upon the practicability of employing this new agent, it has been shown, first, that the oil would answer; but, secondly, that it is not produced in sufficient quantity to prevent a great rise in price if its use were to become general.

**Royal Portraits.**—The paragraphist has been at work again, and, as is not unusual, has been "drawing the long bow," we suspect. A paragraph has been going the round that ten million photographs of the Queen and the Prince and Princess of Wales are produced annually and find a ready sale. We have little doubt that those who possess negatives of these Royal personages wish the facts were as alleged. That there is a large sale for portraits of our Royal Family, both at home and abroad, is a pleasing fact; but, when we are told that it amounts to ten millions annually, one cannot help being a little sceptical on the subject. Possibly, however, the paragraphist may not be at fault; it may be that the compositor had some ciphers in his "case" that he wanted to get rid of.

**Addition to Kew Gardens.**—Last week the Queen's Cottage at Kew was thrown open to the public, or rather the grounds in which it is situated. The little cottage makes a capital subject for photography, and some excellent pictures may be had in its grounds, many of which are admirably adapted for the stereoscope, so are many other views in Kew Gardens. More especially are the interiors of the conservatories and palm-houses adapted for stereoscopic photography, and few things make more pleasing pictures for the stereoscope than such subjects. But it is essential to success that the plates be well backed to avoid halation. Permission to photograph in the grounds and houses must be obtained, but that is readily done by a written application to the Director of the Gardens. The permit, when obtained, also enables its holder to have access to the grounds and conservatories with his camera before they are opened to the general public, which is a great convenience to the photographer. Just now, when the foliage is young, the gardens are especially suited for photography.

**Another Beauty Spot Threatened.**—One by one the beauty spots of Great Britain seem to be doomed. The Falls of Foyer is a case in point. This, not long ago, was acknowledged to be the noblest waterfall in these islands; but now it is robbed of its principal charm because a manufacturing company required a cheap source of water power, chiefly for aluminium works. Now the beautiful Lakes of Killarney are to come under the hammer, or at least a large portion of the district. On the authority of the solicitors for the vendors, what is actually to be put up for sale includes "the Middle Lake of Killarney, a moiety of the Devil's Punchbowl, a moiety of the Mangerton Mountain, two-thirds of the Purple Mountain, the entire of Torc and Innies Mountains, Dinnish and Brickeen Islands, Muckross Abbey, Torc Waterfall, O'Sullivan's Cascade, the Colleen Bawn Rocks, Lord Brandon's Cottage," &c. In all, between 13,000 and 14,000 acres of one of the most beautiful parts of Ireland, so well known to tourists and photographers, are for sale, and, we believe, without restriction as to what use the waterfalls may be applied. Such is the course of events.

**Test for Wood in Paper.**—The peculiar effect of wood as a constituent of paper has frequently been alluded to in these columns, one of the earliest examples having been an instance of alleged "fading" in carbon prints, a "fading" which consisted merely in a yellowing of the whites, the name being given, we presume, by reason of a mistaken analogy to the degradation of the whites in albumenised prints—a common accompaniment of true fading in such photographs. It is obvious, therefore, that a ready means of discovering whether or no a paper is made of virtually pure cellulose—linen rags, &c.—or has an admixture of wood pulp in its texture, is worthy of record. The number of such means has recently been added to by Signor Arnaldo Piutti, who finds that ortho-bromo-

phenitidine hydrochloride imparts to wood a deep yellow tint, while cellulose, the ordinary textile fibres, chitin or chitin, are not acted upon. The reagent is capable even of estimating within a reasonable degree of accuracy the quantity of wood present, as the yellow tint is still produced when all the extractive matter has been removed from the pulp.

**The Metric and the English Systems.**—Anent our reference, a fortnight ago, to the fact that metric weights and measures are not, or need not be, more costly than corresponding ones on our present system, a correspondent writes that fluid measures are supplied, or may be obtained to order, graduated on both systems, i.e., fluid ounces and drachms on the one side and c. c. on the other, so that either scale can be used at will; thus one measure will serve a dual purpose. We are aware of the fact also that the dual graduated measures cost no more than the ordinary, except for the secondary graduations. Further, we have stamped our metric weights with punches with their equivalents in English grains. In this way one set of weights serves for both systems. Any one possessed of a set of number punches, which may be had for a trifle, can stamp his metric weights for himself without trouble. There is no reason why weights, so marked, and which would entail but a trifling additional cost, should not be supplied commercially.

**Another Local Picture Exhibition.**—On Saturday last Mr. G. A. Storey, one of the nominated Judges for the next Royal Photographic Society's Exhibition, opened the Tenth Annual Loan Picture Exhibition at the Borough Polytechnic Institute. In declaring the Exhibition open, Mr. Storey said that these exhibitions gave much pleasure to many thousands of hard workers, who found in art a pure pleasure and a recreation from toil; also that, in the long run, they might benefit artists themselves, for they would show what the public at large most appreciated, and not only merely what satisfied people at the West-end, adding that art should become a real and true friend of the people. This is a practical view of art—what the general public most appreciate. We surmise that the majority of the general public do not much appreciate certain modern "art" photographs, i.e., those of the Salonistic school.

**Royal Society's Soirée.**—At this annual function, which was held on the 3rd instant, there was a most interesting display from Sir W. Crookes in connexion with photography and phosphorescence. It has long been known that certain substances exposed to the molecular bombardment in a Crookes' tube become strongly phosphorescent, and Sir William has been investigating their production, and of late years that portion in the ultra-violet region. These rays are mostly absorbed by vitreous media; hence, to enable them to be examined by photographic means, prisms and lenses of quartz which are transparent to these rays have been used, and at the *Soirée* a set of apparatus, including the necessary apparatus, was shown—a spectrograph with two quartz prisms and condensers. The sensitive surface to receive the rays must be curved and set at an angle to enable proper definition of the lines to be given. To this end celluloid is used as the film support instead of glass, and is curved to a segment with a radius of 190 mm. and set to an angle of 40°. Among the series of photographs taken was one with a set of lines near those of yttrium and supposed to belong to still another new element not hitherto separated. This has been named "Victorium."

#### THE RESEARCHES OF EDMOND BECQUEREL ON DIRECT HELIOCHROMY.

EDMOND BECQUEREL'S researches on the production of colour on chlorinised silver plates began in 1838, and his papers on the subject, to which he gave references in the course of some observations\* on Lippmann's first communication of his method to the French Academy, are as follows:—

\* *Comptes Rendus*, t. xvi. p. 181, and t. xvii. p. 483, 1848; *Ibid.*,

\* *Comptes Rendus*, 1891.



Regnault's Report, t. xxviii. p. 200, 1849; *Annales de Chimie et de Physique*, 3<sup>e</sup> Série, t. xxii. p. 451, 1848; *Ibid.*, t. xiv. 447, and t. xlii. p. 31; Edmond Becquerel, "La Lumière, ses Causes et ses Effets," t. ii. ("Effets"), pp. 209-232.

In 1857, Becquerel read a paper on the subject before the French Photographic Society,\* of which the following is a full translation:—

"I have been asked several times, to give the whole of my researches upon the reproduction of colours under the chemical action of light. I do it with pleasure, although these experiences date back some years and may not be immediately applicable to photography; but, as the substance which has the remarkable property of receiving coloured impressions from light is susceptible of curious physical modifications, I shall give some details, so that those who are interested in the study of the chemical action of light can reproduce easily the different effects which I have obtained.

"There are a great number of substances sensitive to the chemical action of light; some show a partial or complete decomposition, such are certain compounds of silver, of lead, of mercury, of gold, of platinum, &c.; others require the presence of substances which can react upon them, such is chlorine in presence of hydrogen, chromic acid in presence of organic matters, gusiacum in presence of oxygen, &c., but usually, when decomposition takes place, wholly or partially, or when a chemical reaction is shown, the colour of the sensitive substance changes, though often only giving a monochromatic shading, which depends upon the nature of the new compound formed.

"If you take, for example, the iodide of silver, which loses its yellowish colour to darken under the action of light, the new colour which it shows is independent of the refrangibility of the actinic rays. To study better the effect produced, it is necessary to use a solar spectrum, that is to say, of the image formed by the dispersion of the solar rays by means of a prism; if this image is received upon a surface covered with iodide of silver, this last begins to colour in the violet part of the spectrum, and even beyond the violet, then in the blue, that is to say, in the most refrangible part of the visible spectrum; but the tint of this substance, darkened more and more in proportion to the action of the light, is not in accord with the tints of the actinic parts of the spectrum.

"In working with other bodies it will be found that chemical action is shown in the different parts of the spectrum, and one is brought to a similar conclusion.

"One can sum up the preceding remarks by saying that each substance is sensitive between the different limits of refrangibility, and that, reaction being once set up, there is usually only one tint produced, which does not correspond with the colouring of the actinic rays.

"However, amongst all the substances tried there is one which seems to give several tints under the action of the spectrum; it is the chloride of silver. When it is prepared under the usual conditions, it takes a violet tint under the action of diffused light, then afterwards it deepens to brown. If it is exposed to the action of the luminous spectrum, it begins to show colour in the ultra-violet and violet part. Then, if the action is of some duration, and there is diffused light in the dark room, it takes, in the red part of the spectrum, a brick-red tint, as Seebeck observed for the first time.

"Herschell† and Hunt,‡ who have studied the action of light upon different sensitive papers, have also observed that the chloride of silver gave this reddish tint in the red part of the spectrum. It is known, on the other hand, that the chloride of silver coloured violet, if heated, takes a reddish tint exactly like that which is observed in the red part of the spectrum.

"One might suppose that this last effect was due to the action of heat in any case, as the chloride of silver, when it begins to colour, is slightly violet; that it begins to take colour in the most refrangible part of the spectrum, and that, on the other side, it takes a brick-red tint in the least refrangible part, was a singular coincidence to see the two extreme ends of the photogenic impressions of the spectrum turn, one to violet in the violet, the other to red in the prismatic red.

"I began in 1838 and 1839 to study this subject. I had thought that the effect of colouration produced in the visible part of the spectrum was due to a calorific action; but since then I understand that it is not so.

\* "Exposé des Procédés au moyen desquels on peut obtenir la production des Couleurs sous l'action de la Lumière. Fait à la Société Française de Photographie, le 18 Décembre, 1857, par M. Edmond Becquerel, Professeur de Physique au Conservatoire Impérial des Arts et Métiers" (*Bulletin de la Société Française de Photographie*, t. iii. 12 pages). For a copy of this paper I am indebted to M. Henri Becquerel of the Paris Académie des Sciences.

† *Bibliothèque Universelle de Genève*, 1839, tome xxiii. p. 185.

‡ *Ibid.*, tome xxvi. p. 407.

"I have made experiments to determine the conditions under which these results are very clearly obtained. If the chloride of silver is not obtained by double precipitation on the surface of paper, but in a test glass, and deposited upon a surface, such as glass, porcelain, &c., if this chloride has not been exposed previously to the light, as soon as the solar spectrum is projected upon its surface, it only begins to show in the ultra-violet part, and only a light violet tint is obtained, which darkens more and more; on the other hand, there is nothing produced in the visible part of the prismatic image; but, if perfectly pure chloride is used, without excess of nitrate, and this chloride has been exposed beforehand, the effect is very appreciable in the violet, the colour darkens more and more, and is like that which would be produced by diffused light; but, in the red part, a light rosy tint is obtained, and there is no effect well manifested in the yellow and green part, where, nevertheless, a faint discolouration is observed.

"If the chloride is obtained on the surface of a paper, dipped successively in salt water, then in a bath of nitrate of silver, and that there should be an excess of nitrate, the effect is not the same. In this case, where the sheet of paper has not been exposed beforehand to the light, and no chemical action is seen but in the ultra-violet part, as where the paper has been exposed to the rays, and it becomes sensitive even in the sensitive part of the spectrum from the blue to the red, there is then a continuing action, and the effects of colouration are weak, if they are even observable.

"I thought from this to prepare the chloride of silver directly by attacking a layer of silver by either gaseous chlorine or arising from the decomposition of chlorides. I worked then by exposing a silver-black to the action of gaseous chlorine; the layer became greyish-white, and, on throwing the solar spectrum upon its surface, no clear phenomenon was observed, only a greyish tint showed itself in the violet, and denoted a chemical reaction. I then attacked the layer of silver by chlorine given off from chlorine water, or, better still, by dipping it in chlorine water itself. The layer, having remained plunged in the water for some minutes, had covered itself with a deposit having a grey-white tint, and the actions of light were very different. After having projected the luminous spectrum upon its surface during some minutes, upon drawing out the layer and examining it by daylight, I perceived a kind of souvenir of the spectrum fixed upon the layer, of which the parts corresponded exactly with the luminous parts of the solar spectrum; the place where the red ray had fallen was pale red, the yellow was yellow, the blue blue, &c. Upon placing again the layer in the same position, and letting the action of the spectrum continue for some time, the effects disappeared, and, in the end, a grey tint remained, which extended over all the parts upon which the spectrum fell. I saw then that it was not only a simple coincidence of tint which had given to the chloride of silver exposed beforehand the red colour of one side of the spectrum and violet of the other, but that in this case the unchanged white chloride was mixed most likely with sub-chloride, that is to say, of a chloride having an equivalent of chlorine, less than the white chloride, and that this last substance gave rise to the tints observed.

"I substituted then for chlorine water solutions of chlorides and hypochlorites, capable of yielding chlorine to a silver layer, and I obtained, as with the first solution, surfaces capable of reproducing the image of the spectrum with its colours.

"That which has succeeded the best, the composition of which I published in 1848, at the time of the publication of my first work,\* is a solution containing bichloride of copper. The following preparation is very easy to obtain. Take the ordinary sulphate of copper and chloride of sodium; put these two salts in excess in a test glass with a certain quantity of water; the solution produces a double reaction and forms bichloride of copper. Mix a part of this liquid with a part of a saturated solution of sea salt and six parts of water; then plunge a plate of silver, or plated with silver, in this liquid; it takes quickly a violet tint, due to the presence of a light layer of chloride of silver, and it becomes sensitive to the action of the spectrum, of which it reproduces the principal colourings. The layers of silver employed should be of great purity, because this treatment brings out the slightest traces of foreign matter which are found on the surface.

"I ought to say, however, that this manner of preparation, though simple, does not allow the increase at will of the sensitive layer; therefore I have quite given it up in my other experiments,† to substitute for it a manner of preparation which allows the layer obtained to give results otherwise remarkable, and to have any thickness wished.

\* Paper presented to the Académie des Sciences de l'Institut, February 7, 1848, and published in the *Annales de Chimie et de Physique*, Série III. tome xxii. p. 451.

† *Annales de Chimie et de Physique*, Série III. tome xxv. (1849) p. 447, and tome xlii. p. 81.



"This formula consists in bringing, little by little, by the action of electricity, to the surface of the layers of plate chlorine in the nascent state, which attacks the silver, and gives sensitive layers.

"To make this preparation, take a plated plate well polished and cover the reverse side with an alcohol varnish, in order that there should be only the silver surface to conduct electricity, and upon which the chlorine can act.

"This plate is fastened with hooks of copper to the positive conductor of a voltaic pile of one or two elements. A thread, or a plate of platinum, is attached to the negative pole, and the plate of silver, with that of platinum, is plunged into a mixture of 8 parts of water and 1 of hydrochloric acid by volume. The chemical action of the electric current gives hydrogen upon the platinum, and chlorine upon the silver, at the positive pole. This last is then attacked, and, in fact, it colours itself a violet-grey; then the tint deepens, and, if the action continues during some minutes, the plate becomes black, as if covered with smoke. When once the plate is thus prepared, it need only be polished with cotton or leather to clear away the kind of veil which covers it, and it can be used to reproduce immediately coloured impressions under the action of light. This process of preparation of chloride is the best which can be used to obtain the reproduction of the images of the spectrum with all its tints, and, under certain conditions, the images of the dark room.

PHILLIP E. B. JOURDAIN.

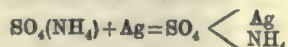
(To be continued.)

#### AMMONIUM PERSULPHATE—ITS PROPERTIES AND USES.

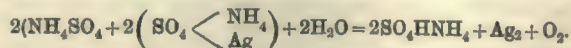
We have received a letter from Professor Namias, pointing out that his valuable paper, "Ammonium Persulphate—Its Properties and Uses," which appeared in our last two issues, originally appeared in his journal, *Il Progresso Fotografico*, and he also says that, through an error, the sentence on p. 231, line 14 from bottom, column 2, "'Namias now remarks that the existence of a large excess of persulphate must only result in the solution of the chloride' is unintelligible, and that the word we have italicised should be 'silver salt.'"

MM. Auguste and Louis Lumière recently read a note before the Société Française de Photographie in which they combat this statement of Professor Namias and say, that when they pointed out the curious property which ammonium persulphate possesses of reducing negatives by dissolving the densest parts of the image in preference to the half-tones, that is to say, in acting at the bottom of the film rather than at the surface, they had propounded a theory which has been the subject of some contradictions.

They have admitted in effect that ammonium persulphate dissolves the silver image and gives rise to the formation of a double sulphate of ammonia and silver according to the equation—



They supposed that this double sulphate was in proportion to its formation diffused through the film of gelatine into the solution containing the excess of persulphate, and that the latter could, like hydrogen peroxide, play in this case the part of a reducer, in the presence of water, simply by the disengagement of oxygen according to the following equation:—



In this way any exterior solvent action of the persulphate on the silver was prevented by the tendency towards an inverse action, which gave rise to the precipitation of silver on the surface of the image. They explained in this way why the density of the image was reduced from below to the surface of the image, and not in the inverse direction as is usual.

Professor Namias contends that their hypothesis is not correct, because ammonium persulphate does not reduce silver nitrate when a small quantity of soluble silver salt is added to an excess of ammonium persulphate, which is the case when a negative is placed in a solution of this reagent. The reduction not taking place, except in the presence of an excess of a soluble salt of silver, M. Namias does not admit the possibility of a deposition of silver on the negative.

In order to confirm their original hypothesis, they have prepared directly the double sulphate of silver and ammonium by dissolving to saturation precipitated silver in five per cent. solution of the persulphate.

They have proved that this double salt can, in the presence of a reducer such as pyrogallol acid or hydroquinone, deposit metallic silver on a negative, that is to say, it can act like a physical intensifier, without

any silver being directly reduced in the solution, which remains clear in the cold sufficiently long for it to deposit its silver on a negative placed in it.

It may be admitted, therefore, that the silver is precipitated from the soluble salt on the negative without this action actually taking place in the solution itself; consequently, this remark is no contradiction to their first hypothesis.

#### PRACTICAL NOTES ON SOME IRON PRINTING PROCESSES.

##### PART I.—WHITE ON BLUE GROUND.

##### *Ferro-prussiate, Negative Cyanotype, Blue Printing.*

THIS process, probably, was discovered by Sir J. Herschel about 1840–42, and named by him Cyanotype, from *κυανός* (cyanos), or some dark-blue substance known to the ancients, probably *lapis lazuli*. Essentially the process consists in (a) coating paper with a mixture of ammonio-citrate of iron and ferrocyanide of potassium; (b) exposure to light, producing insoluble Prussian blue (i.e., Turnbull's blue,  $\text{Fe}_3\text{O}_4$ ); (c) development by washing away with water the soluble portions, resulting in a positive print (from an ordinary negative), showing a picture in blue on a white ground. The resulting image is unaffected by hot or cold water, and is practically permanent.

*The Paper.*—The character of the result varies according to the kind of paper used. The best paper for this process is that made from rags, and containing very little, if any, wood pulp. It should not be strongly sized or highly glazed, and when looked through should appear of an even woven texture, without clear or opaque spots. Plain Rives paper is recommended, as also are the better kinds of smooth drawing papers. A two per cent. solution of arrowroot in boiling water is suggested as a good strength for sizing a paper not previously sized.

*Sensitising Mixtures.*—A large number of mixtures have been used with varying results.

##### HERSCHEL'S FORMULA.

A.	
1. Ammonio-citrate of iron .....	20 parts.
Water .....	100 "
B.	
Potassium ferriocyanide .....	16 parts.
Water .....	100 "

If distilled water is used, the above solutions will keep good a long time. In preparing B, the crystals should be first rinsed quickly with cold water, and then thrown on to blotting-paper, to be dried before being weighed. (N.B.—This salt is poisonous.) If this precaution of removing from the ruby-red ferriocyanide the surface yellow powder of ferrocyanide be neglected, the purity of the whites in the resulting print will be impaired. The sensitising mixture consists of equal parts of A and B, mixed as required, and filtered before use. The mixture will keep for a while if stored in an opaque bottle, but for evenness of results freshly made mixtures are recommended.

*Coating the Paper.*—In order to render the sheet more manageable, it may be quickly dipped in cold water, then laid between clean blotting-paper until it is just limp, but not wet. It is now pinned down on a flat board or stiff card, and the sensitising mixture applied with a Blanchard's brush, or small, clean sponge partly stuffed into the neck of a bottle, or by a soft hair varnish brush, or, preferably, by a cotton-wool brush. Or the paper may be floated on to the mixture for about three minutes. Care must be taken to coat the paper as quickly and as evenly as possible, i.e., by moving the brush first one way the length of the sheet, and then again at right angles to the first strokes.

*Drying.*—Next it is highly important that the paper be dried as quickly as possible, so as to keep the coating mixture on the surface. Drying should take place in the dark. In summer, some place where there is a strong draught may serve; in winter, each sheet may be held before a fire for a few moments.

##### Other Sensitising Formula:—

A.	
2. Ammonio-citrate of iron .....	1 part.
Water .....	4 parts.
B.	
Potassium ferriocyanide .....	1 part.
Water .....	4 parts.

For sensitising, take equal parts. (It may be observed that this is equivalent to saying "120 grains per ounce.")

A.	
3. Ammonio-citrate of iron .....	150 parts.
Water .....	500 "
B.	
Potassium ferriocyanide .....	80 parts.
Water .....	400 "
Mix and add potassium bichromate, 1 part.	



This addition is said to improve the keeping qualities of the mixture, and also of the paper when coated. The addition of 5 to 10 parts of pure alcohol has been suggested for the same purpose.

A.	
4. Ammonio-citrate of iron.....	9 parts.
Water .....	30 "
B.	
Potassium ferricyanide .....	80 parts.
Ammonia (880) .....	7 "
Oxalic acid (saturated solution) .....	60 "
Water .....	300 "

Mix in equal proportions. This, again, is more sensitive than the original formula.

5. To prevent the watery solution sinking into the paper and yielding a dead, flat, "sunk-in" look, various additions have been suggested, e.g., gum, &c.:-

A.	
Gum arabic .....	1 part.
Ammonio-citrate of iron .....	5 parts.
Water .....	20 "

B.	
Potassium ferricyanide .....	3 parts.
Water .....	20 "

Mix in equal proportions to use.

6. The following formula is said to yield a paper that keeps well and prints quickly:-

A.	
Boracic acid .....	1 part.
Ammonio-citrate of iron .....	100 parts.
Water .....	300 "

B.	
Potassium ferricyanide .....	100 parts.
Water .....	300 "

7. There are two forms of the ammonio-citrate of iron, viz., brown and green. The latter, though not easy to obtain commercially, possesses considerable advantages. The following formula is strongly recommended:-

A.	
Ammonio-citrate (green) .....	120 parts.
Water .....	500 "

B.	
Potassium ferricyanide .....	45 parts.
Water .....	500 "

Mix in equal proportions.

Paper thus prepared is estimated to take only one-sixth of the time of that required by paper prepared with the ordinary brown ammonio-citrate of iron.

8. Where the green ammonio-citrate (mentioned under formula 7) cannot be obtained, the solution prepared from its ordinary brown form may have its sensitiveness increased by the addition of ferric oxalate. Thus, of ferric oxalate take 20 grammes, and dissolve in water sufficient to make 100 c.c. Now of the ordinary mixture as given in formula 1 or 2 take 100 c.c., and to this add not more than 2 c.c. of the above-named ferric-oxalate solution (i.e. 20 per cent. strength). Again, in place of the ferric oxalate, we may use the potassio-ferric, sodio-ferric or ammonio-ferric oxalates, the last being supposed to yield the greatest gain in sensitiveness.

9. Another formula which is said to yield a mixture which improves if kept (in the dark) a few days before use is:-

Potassium ferricyanide .....	8 parts.
Brown ammonio-citrate of iron .....	10 "
Sodio-ferric oxalate.....	2 "
Water .....	60 "

10. The following formula is pronounced to yield a paper which will keep in working order for a couple of months if stored in a dry place. Make up solutions "one in ten" of each of the following, viz.:-

Ammonio-citrate of iron.  
Potassium ferricyanide.  
Potassium bichromate.

For use take equal parts and acidulate by adding one or two crystals of oxalic acid. Float the paper and dry quickly.

11. The following is strongly recommended:-

A.	
Ammonio-citrate of iron .....	300 grains.
Water.....	3½ ounces.

B.	
Potassium ferricyanide.....	300 grains.
Water.....	3½ ounces.

Mix in equal parts, and to each 10 parts of the mixture add 1 to 3 parts of a saturated solution of oxalic acid.

12. Another formula said to give a very quick-printing paper:-

A.—Ammonio-citrate of iron (120 grains per ounce). Ammonia added until it just faintly smells of ammonia after shaking.

B.—Potassium ferricyanide, 150 grains per ounce.

C.—Oxalic acid, saturated solution.

Of A and B take 5 parts, mix, and add 1 part of C.

Each of the following formulae is recommended by some eminent authority:-

A.	
13. Potassium ferricyanide .....	1 part.
Water .....	10 parts.

B.	
Ferric potassic oxalate .....	1 part.
Water .....	10 parts.

Take equal parts of A and B.

A.	
14. Potassium ferricyanide .....	10 parts.
Water .....	35 "

B.	
Ammonio-nitrate of iron .....	15 parts.
Water .....	85 "

Take equal parts of A and B.

A.	
15. Boracic acid .....	1 part.
Ammonio-citrate of iron .....	100 parts.
Water .....	200 "

B.	
Potassium ferricyanide.....	100 parts.
Water .....	200 "

Take equal parts of A and B.

An Alternative Method.

16. Take 10 parts potassio-ferric oxalate in 100 parts of water. Coat the paper and print in the usual way. Develop with a 5 per cent. solution of potassium ferricyanide.

Sensitising Fabrics.

The following fabrics may be used for this process:-Linen, calico, silk. The fabric should be very thoroughly washed in plenty of warm water.

If the material is creased, it must be ironed while it is slightly damp.

Next it should be sized by immersing in a (one in 50 or 60) solution of "hard" gelatine—allowed to drain a few minutes and then pinned to a board or stout card to dry.

17. Sensitising mixture:-

A.	
Ammonio-citrate of iron .....	1½ ounces.
Water .....	8 "

B.	
Potassium ferricyanide .....	1½ ounces.
Water.....	8 "

Take equal parts, filter, and apply quickly and evenly with a quite clean hog's-hair brush and dry quickly.

18. Another formula is—of ammonio-citrate make a 25 per cent. solution, and of the potassium ferricyanide a 20 per cent. solution. Of these take equal parts.

19. A more sensitive mixture may be made as follows:-

Of citric acid .....	make a 26 per cent. solution.
Potassium-ferricyanide .....	22 " "
Ferric chloride .....	20 " "

Add 100 parts of the citric acid solution to 100 parts of the potassium ferricyanide solution. Shake and add slowly with constant shaking 40 parts of strong ammonia. Lastly, add 100 parts of the ferric chloride (iron perchloride solution). Apply with a brush and dry quickly.

REV. F. C. LAMBERT.

## ON THE ACTION OF LIGHT ON THE SALTS OF COBALT.\*

### PART IV. EXPERIMENTS WITH COBALTIC OXALATE.

Of all the cobaltic salts the oxalate seems the most suitable for use in the processes of photography. It is best prepared by dissolving, by the aid of heat, well-washed cobaltic hydrate in a concentrated aqueous solution of pure crystallised oxalic acid. The heat must be applied very gradually, and discontinued at the instant when the last trace of the brown hydrate is converted into oxalate, otherwise the newly formed cobaltic salt will be reduced to the cobaltous state. So prepared, cobaltic oxalate forms a beautiful emerald green solution, from which, by evaporation in

\* Continued from p. 660, vol. 45.



*vacuo*, the salt itself may be obtained in the crystalline state. In the cold the solution is remarkably stable, and, if preserved in a dark place, may be exposed freely to the action of the atmosphere even for months without undergoing perceptible chemical change. Heat, however, causes a precipitation of the rose-coloured cobaltous oxalate, the change seeming to be brought about most speedily when the solution is raised to its boiling point. Slight variations in temperature are, notwithstanding, without influence on its stability, and hence the heat experienced during the summer months will not effect its decomposition. When subjected to spectroscopic examination it exhibits a well-defined absorption spectrum, in which the violet and the indigo rays are completely cut off, along with part of the blue, whilst a broad black band supplies the place of the yellow rays.

Several sheets of paper, previously sized with arrowroot starch, were coated with a moderately strong aqueous solution of the oxalate and dried in the dark. One of the freshly prepared sheets was exposed under a negative in bright sunshine, and was found to print very quickly, a distinct pale pink positive image in cobaltous oxalate being impressed in the space of ninety seconds.

By immersing this in a bath of potassium ferricyanide in aqueous solution the colour of the picture was considerably intensified. A mixture of ferrocyanide and ferricyanide of potassium solutions turned the print violet at the margins.

An alcoholic solution of gallic acid turned the deposit to a greenish hue, but at the same time destroyed the clearness of the image.

The sensitiveness of paper sensitised with cobaltic oxalate was found to be impaired by keeping. Two sheets which had been allowed to remain in the dark for a week after sensitising were successively exposed under the same negative, the first for five hours in sunshine, and the second for seven hours in dull, diffused daylight.

Only a very faint image was visible after exposure on sheet number one.

Treated with ferricyanide solution, as in the former case, the paper now merely assumed a bluish-green hue all over, and the image vanished.

The second sheet showed not a vestige of an image impressed by light; but, when developed in an alcoholic solution of gallic acid to which one-third of its volume of water had been added, the details of the picture began to reveal themselves in the course of eight or nine minutes, and, by adding a few drops of aqueous ammonia solution, the progress of the development was much accelerated.

The image formed was of a purple hue, and in the bath appeared fairly vigorous.

When, however, it was removed and washed in water, the depth of the deposit was materially reduced, only a very faint outline of the subject being left. The colour, too, changed on washing from purple to orange-red.

By exposing a sheet of oxalate paper in direct sunshine under a negative for fifteen hours, an image differing slightly from those already mentioned was obtained. Instead of being wholly pink, the details were impressed in pale grass-green upon a pink ground. This green image seemed to be the result of an intermediate stage in a secondary or bleaching action (such as has been already described in the case of other of the cobaltic compounds), for, on being again exposed to light, it was almost obliterated by the time that ten hours more had elapsed. On treating the exposed sheet with an aqueous solution of potassium ferrocyanide, a vivid indigo blue image was produced, which, on washing in water, gradually assumed a bluish-green tint. On drying before a fire, purple streaks made their appearance on the surface of the print, spoiling its original beauty of tone. These seemed to be due to irregular coating in the sensitising operations.

Cobaltous oxalate being rather too pale in colour to give in itself a satisfactory representation of the action of the spectrum, it was found necessary to resort to development in carrying out the under-mentioned spectroscopic experiments.

The first was made by exposing a sheet of the oxalate paper to sunlight in the spectrum slide for a period of four hours. For developer a mixture of aqueous solutions of chrome alum and potassium ferricyanide was employed.

On immersing the print in the developing bath, a vivid blue image was speedily obtained. A graphic representation of this image is shown in fig. 7 of the diagrams accompanying the present article. The maximum

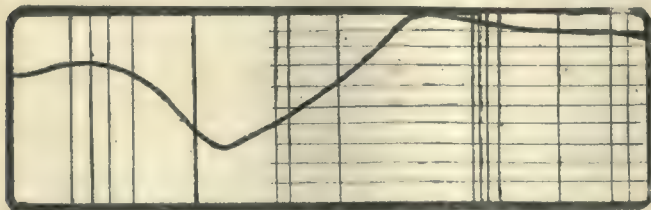


FIG. 7.

effect is in this case exhibited in the region of the blue, and the minimum in the region of the yellow rays. The indigo and the violet rays are little inferior in influence to the blue. The most remarkable feature of

the diagram is, however, the prominent part played by the red rays. In all probability, the actinic activity of that portion of the spectrum is to be largely, if not wholly, attributed to a secondary or reversing action, seeing that the exposure of the print was necessarily somewhat prolonged. In the next experiment the sensitised paper was exposed to the action of light for upwards of thirty-five hours. On removal from the slide, it was divided lengthways into two parts, the first of which was developed in the alum and ferricyanide bath as before, and the second in an aqueous solution of the ferricyanide alone. In both cases a fairly vigorous greenish-blue image was produced, that obtained in the chromium bath being rather less intense than the other. Fig. 8 represents the spectrum

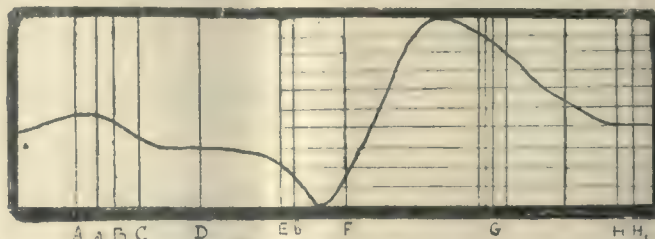


FIG. 8.—COBALTIC OXALATE.

produced by the simple ferricyanide developer. The point of maximum activity again appears in the blue, but the minimum has shifted from the region of the yellow to that of the green rays, while the former influence of the red rays has, so to speak, undergone a process of levelling down, and what still remains of it is now shared with the yellow and the orange rays. There is also a considerable weakening of intensity at the more refrangible end of the spectrum, the violet rays in particular being divested of much of their actinic power, as will appear by comparison with the companion figure.

The range of intensities shown on the strip that was developed in the alum bath was in all respects similar to that exhibited in fig. 8.

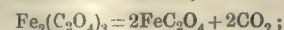
The chemical reaction involved in the decomposition of cobaltic oxalate by light is precisely analogous to that which occurs when ferric oxalate is decomposed under like conditions.

In the latter case the products are ferrous oxalate and carbon oxide; in the former, carbon dioxide and cobaltous oxalate.

The action of light or heat on the cobaltic salt may therefore be represented by this simple equation:—



In the case of the iron salt the reaction, of course, is:—



which, it will be seen, differs from the first equation only by the substitution of two atoms of iron for the two atoms of cobalt. The compounds formed by the union of cobaltic oxide or hydrate with tartaric, acetic, citric, and other organic acids also give off carbon dioxide on their reduction by light to the cobaltous state; but, generally speaking, the reaction in such cases is more complicated than that representing the decomposition of the oxalate, owing to the formation of additional by-products. As might be expected, this is found to apply with equal force to the corresponding ferric compounds of these acids.

Like cobaltic citrate, cobaltic oxalate is powerfully acted upon by light in the presence of potassium bichromate, forming an image which is gradually bleached under the further influence of the actinic rays. As an illustration of the behaviour of the salt under these circumstances, the following experiment, as being a typical one, deserves notice:—

A sheet of unsized paper, which had been first coated with an aqueous solution of the dichromate and dried in the dark, was sensitised with the oxalate, and, when dry, exposed under a negative for fifteen minutes in bright sunshine. A green image was obtained, all the details of which were perfectly distinct and fairly satisfactory in the matter of density. On exposing print and negative again to light, there was for a little time a gradual, but perceptible, increase in the depth of the colour of the image; but soon a bleaching action began to make itself apparent, and at the expiry of three hours the picture had almost disappeared from view. On treating the print thus over-exposed with a solution of potassium ferricyanide, the image was speedily rendered invisible, owing to the formation of a pale plum-coloured deposit, in all probability a mixture of the ferricyanides of cobalt and chromium. A little tannic acid in aqueous solution was next added to the developer; but, as this produced no change in the appearance of the print, the latter was removed from the bath and, after washing in cold water, treated with a weak aqueous solution of ammonia. By the action of the alkali the image was again rendered visible, though only faintly so, its colour being now, however, a pale grey.

Cobaltic oxalate, it should be mentioned, is non deliquescent, a circumstance which serves to enhance its other merits as a sensitising agent.

*Experiments with Cobaltic Lactate.*—The salt employed in the present series of investigations was prepared by double decomposition. Unsized paper was coated, in the first instance, with a solution of cobaltic citrate



and dried in the dark. A strong aqueous solution of sodium lactate was then applied to the prepared surface by coating, and the paper was again laid aside to dry. It was found, however, that the cobaltic salt thus formed possessed too great an affinity for moisture to permit of the desiccating process being successfully carried out. When the drying was nominally at an end, the paper still retained enough water to render it perceptibly damp, and during the exposure to light it absorbed additional moisture from the atmosphere, assuming towards the close of the operations quite a pulpy condition.

In the first experiment with the lactate the sensitised paper was exposed beneath a negative in sunshine and diffused light. In about twelve hours' time a fairly strong image, of a brick-red colour, was produced, the details of which were, however, considerably blurred, owing to the solvent action of the absorbed water. On gradually increasing the exposure, the picture underwent but little alteration, nor, even after several hours more had elapsed, were any signs of a reverse or bleaching action apparent.

In the second experiment the paper was exposed for a like interval and under similar conditions to the action of the spectrum. As before, a somewhat blurred reddish image was obtained. Of this fig. 9 affords

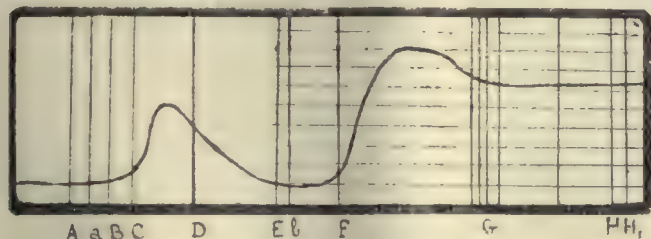


FIG. 9.—COBALTIC LACTATE.

an approximate graphic representation. Here the point of maximum intensity is again situated in the blue. There are two points in the spectrum representing the minima, the one in the red and the other in the green rays. The indigo and the violet rays rank next to the blue in intensity, and after them the orange rays, all three exercising a comparatively strong influence. The power of the yellow rays is somewhat feeble, being only one-half of that due to the violet or indigo rays.

In order to produce an image by "printing out" on the lactate paper, it seems necessary that the paper should be used as soon after sensitising as possible. If kept for a few days, little or no visible reduction is effected by exposure to light; but, instead, a latent image is impressed, which may be developed by suitable means. The following experiments were made with paper which had been kept for from two to three weeks in darkness after sensitising.

Three sheets were exposed in succession to the action of the spectrum, an exposure of thirty-six hours being given in each case. The first of these was immersed for ten minutes in a bath containing potassium-ferrocyanide solution, but no image could be perceived. The second sheet was soaked for a few seconds in potassium-ferrocyanide solution, whereupon a distinct violet-grey image manifested itself. The range of intensity thereof could not be determined with exactitude, but it was noticed that the maximum action was due to the green rays. The developer was next rendered strongly alkaline by the addition of an aqueous solution of caustic potash, and the third strip was then transferred to the bath. An image very similar to the last was immediately obtained, the green rays again appearing to exercise the predominant influence, and the yellow rays one of almost equal intensity.

By reason of its peculiarly hygroscopic character, cobaltic lactate must be placed in the category of photographic curiosities rather than in that of salts available for practical printing purposes.

#### EXPERIMENTS WITH COBALTIC FERROCYANIDE.

Unsize paper was sensitised with a strong aqueous solution of potassium ferrocyanide, and, after drying in darkness, with a weak solution of cobaltic citrate. After drying a second time it was found that there was a very slight reduction of the cobaltic salt, indicated by the paper's having assumed a uniform tint of very pale green.

On exposing a portion of the sheet under a negative to diffused daylight for a few minutes, a very distinct yellowish-green image, due to cobaltous ferrocyanide, was produced.

On treating this picture with an aqueous solution of stannic chloride, the green colour became slightly stronger, but no gain in contrast ensued. During this process minute bubbles of a gas were evolved from the coating of the paper, perhaps due to the conversion of the unreduced cobaltic ferrocyanide into the unstable chloride, the latter a salt which very readily parts with portion of its chlorine.

A second ferrocyanide print was washed over with a weak aqueous solution of potassium permanganate, whereupon the green image was replaced by a violet-coloured deposit, through which the details of the picture could be traced only with difficulty.

A third and similar print was immersed in an alcoholic solution of gallic acid, but no change of colour was apparent, nor were there any

signs of intensification of the image already deposited. An aqueous solution of calcium hypochlorite was also found to have no visible influence upon the ferrocyanide picture. A fifth print was soaked for half an hour in an aqueous solution of disodic orthophosphate rendered alkaline by the addition of ammonia. A reddish-brown deposit was gradually formed, but, instead of being intensified, the details of the image were considerably obscured. A sixth print, on being immersed in an aqueous solution of cupric chloride, changed hue from green to purple-brown, but the relative intensities of light and shade remained unaltered.

The ferrocyanide was next subjected to spectroscopic examination. For this purpose paper was coated with a special solution of cobaltic ferrocyanide, made by adding cobaltic oxalate in the necessary combining proportions to a strong aqueous solution of potassium ferrocyanide. When dry, the sensitised sheet was exposed to the action of the spectrum in the usual manner, an exposure of six hours being, however, given, in order to obtain a sufficiently vigorous image. As before, the colour of the picture was a light green, inclining to yellow or yellowish-brown in the regions where the light had exercised the least action. A representation of this ferrocyanide spectrum is given in fig. 10. The violet rays, it will

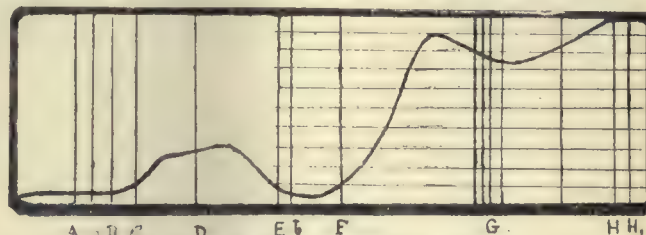


FIG. 10.—COBALTIC FERROCYANIDE.

be noticed, exercise the strongest influence, after which the blue and the indigo rank next in power. There are again two minima points, the one in the red, the other in the green, both sets of rays being practically inoperative. On the other hand, the yellow, and, to a less degree, the orange, rays exert a fair share of chemical action. The superficial resemblance which this spectrum bears to that of the lactate is also worthy of note.

Some further experiments were made with the ferrocyanide in combination with cobaltic iodide. These will be noticed in a later article describing the reactions of the haloid cobaltic salts.

#### EXPERIMENTS WITH COBALTIC FERRICYANIDE.

Cobaltic ferricyanide, *per se*, appears to be little sensitive to actinic action. An experiment was made by sensitising a sheet of unsized paper (1) with a solution of cobaltic citrate, and (2), after drying, with a strong aqueous solution of potassium ferricyanide. After the second drying it was found that the ferricyanide had partially reduced the cobaltic compound to the cobaltous state, thereby producing a pale reddish-coloured deposit. Exposure of this paper was made under a negative in bright sunshine for upwards of seven hours, but no image whatever was produced, nor, by immersing the paper after printing operations in a second bath of the ferricyanide solution, was any change effected in its appearance. Paper was next coated with the ferricyanide solution and allowed to dry, then sensitised a second time with a solution of cobaltic citrate to which a drop or two of acetic acid had been previously added. The cobaltic salt was again reduced without access of light, this time to such an extent as to render the paper useless for photographic purposes. The operations last mentioned were then repeated upon paper which had been previously sensitised with an aqueous solution of potassium bichromate. After drying, the sheet was found to have assumed a red or reddish-violet hue of considerable depth, due as before to the formation of cobaltous ferrocyanide. This prepared paper was exposed under a negative for from thirty to thirty-five hours in sunshine and diffused light. The resulting print was of a unique and extremely curious character. The sensitised surface was found to have been bleached almost white in the portions which had been least exposed to actinic action, i.e., in those parts representing the high lights of the positive image. The red ground or field, on the contrary, seemed to have suffered little alteration. The image, in fact, was wholly due to the disappearance, to a greater or less extent, of the original coloured deposit formed in the dark. The back of the print, however, was found to bear a positive image of a rich and deep purple colour, the high lights of which were represented by the yellow of the unchanged dichromate substratum. Portions of the print were treated with aqueous solutions of various reagents. No visible alteration was produced either by disodic orthophosphate and ammonia, or by calcium hypochlorite, whilst stannic chloride produced but a slight change. Potassium permanganate gave a brown colour, but, as usual, its action on the paper destroyed the clearness of the picture.

The experiment above described has a certain theoretical interest, demonstrating as it does that light may exercise a bleaching action upon a cobaltous salt in cases in which the primary action resulting in the formation of the compound has been performed in darkness by quite a different agency, as for instance, by thermal action, chemical forces, or change of molecular state.



## ALPINE PHOTOGRAPHY.

It is a common saying that some subjects are far more suitable for photographic illustration than others, and, if we were to analyse the matter, we should probably find that it is merely a question of colour. For example, a greenhouse full of brilliantly petalled flowers would be deemed less favourable to camera interpretation than the chiselled front of a grey cathedral. The same thing holds good with regard to snow and ice pictures, taken at high altitudes, which are rendered far more truthfully by photography than are the plains below, where a variegated vegetation presents difficulties which are familiar to all. Indeed, it may be said that there is no class of work which gives more satisfactory results to the photographer than those taken above the snow line in mountainous districts.

But there are snow pictures and snow pictures, some that we have seen being of the chalk-and-soot kind, and others, taken by experienced hands, being as soft and delicate in gradation as it is possible to obtain them. In the latter category must be placed the extremely beautiful series of slides which illustrated a discourse by Dr. Anderson at the Camera Club on Monday last week, each one of which was a gem of the first water. And no one was prepared for such an excellent display, for the notification of the lecture merely said that it was a discourse about glaciers and glacier action. A subject such as this is apt to impress the ordinary mind with the idea of dry, scientific facts, but Dr. Anderson, who is a prominent member of the Alpine Club, and an enthusiastic climber, invested the story with the interest of a fairy romance, and his audience, whether owning alpenstocks or not, thoroughly appreciated both the story and the pictures which so ably illustrated it. And the story is a fairy-like and pretty one. The glaciers are born in the clouds, for it is the moisture condensed from the vapours which hang among the cold peaks that forms the snow and ice spicules which give them their origin. Then the snow and ice become compressed into a solid mass, looking more like crystallised sugar than like the black ice that we are accustomed to see on the lakes and rivers. The mass is heavy, and it begins to slowly slide down the mountain sides, forces its way between the rugged peaks, gets more and more broken up on its journey, and affords magnificent effects as the sun's rays slant along it and show the crevasses which gradually tear it asunder. Then the hot beams of the sun begin to act upon the surface, and the glacier is cut up with running streams, which sometimes form a thundering waterfall when the course of one is interrupted by a crevasse. But these are only episodes in the journey of the main mass of ice, which flows imperceptibly towards the level of the plains below. It is these episodes which Dr. Anderson illustrated so grandly by means of his pictures. Not a point of any interest was missing. A tumbling stream of to-day was the bulky icicle of the morrow, and the pictures were shown in such complete series that it was easy to understand the working out of problems which, in days of old, were shrouded with mystery and superstition.

The trailing glacier itself, with its huge scales and sinuous tail, was a dragon which ruled the destinies of the mountain valleys, and no one had penetrated the zone of enchantment lying beyond, up among the mountain peaks. To-day the scientific explorer and the photographer join hands to make these once mysterious things understood by all, while at the same time the sense of vision is gratified by the natural beauties revealed by the camera. The glacier is presented as a sea of hummocky ice, with its bending dirt bands showing how it moves more quickly at the centre than at the sides, and its carried *débris* in the form of lateral and median moraines.

Dr. Anderson did well to take several of his finest views shortly after sunrise, when shadows were long and every speck on the snowy surfaces was rendered apparent. He used for all his views medium isochromatic plates, the value of which for this kind of subject has long ago been acknowledged. For snap-shots only did he employ rapid plates of the ordinary kind, and some of these, notably those of the villagers, were extremely good, and in some cases entertaining. It is also to be noted that Dr. Anderson, for his Alpine views, made good use of the tele-photo lens, and a comparison of the pictures so obtained with others taken from the same position with an ordinary lens attested the value for mountain work of the former. Some of the views were taken with the sun in front, and very beautiful effects were thus obtained, owing to the intense illumination of the upper edges of the ice and snow ridges. Much interest was also aroused by the pictures of glacier tables, huge masses of rock supported on pillars of ice, the table top so formed protecting the ice pillar from the rays of the sun. And thus, giving his audience every opportunity of seeing what he described, Dr. Anderson brought them to the foot, or rather "snout," of the glacier, where it forms into fairy caves, from the hollows of which issue streams of muddy water, the source, it may be, of a mighty river.

So far Dr. Anderson dealt with glaciers of the first order of merit, but there are minor ones which fill up the depressions in a mountain-side and will sometimes come thundering down *en masse* on a devoted village. One of these he showed us, which assumes this dangerous condition about every hundred years. Its last escapade was in 1872, when it buried 150 cattle and their caretakers.

It was not the least interesting portion of the lecture which showed that similar incidents which are occurring in Alpine districts to-day took place during the great ice age in Yorkshire and our other northern counties. Glacier action there has left its marks on the rocks just as it

is scoring the limestone of the Swiss valleys now. This point was made clear by several comparative pictures. The proceedings were listened to with rapt attention, and Dr. Anderson was the recipient of a hearty vote of thanks.

Tuesday week was a Ladies' Night, and the Club had the great advantage of the help of Miss Marian Mackenzie, whose vocal efforts, it need hardly be said, gave much pleasure to all. In addition to an excellent concert, there was a lantern show, a cinematograph exhibition, besides a phonograph and X-ray demonstration.

## THE WEISS FLASHLIGHT APPARATUS.

At the Photographic Club, on May 8, Mr. Reinhold Thiele addressed the meeting on the subject of flashlight photography, and instantaneous flashlight photography in particular, referring to the faults and shortcomings of artificial lights in use, all of which the new Weiss apparatus claims to have overcome. The electric arc light, with its immense actinic properties, is yet far from being a satisfactory illuminant, especially with nervous persons and children, its liability to contort the features and encourage an unnatural expression being serious obstacles to its general use. Its great brilliance also tends to an undesirable flatness in the portrait, whereas our aim is always to get a result as nearly like that produced by daylight as it is possible to do. Another factor which operated against the electric light was the comparative difficulty of transport, energy not being obtainable at all times and in every place. Added to these must be the matter of cost, which is high, and the fact that there was an essence of unreliability about electrical apparatus. The incandescent electric light is one which necessitates a long exposure, besides being very poor in ultra-violet rays, although rich in red and yellow. Magnesium blow lamps Mr. Thiele generally found unreliable. More often than not the lamp becomes clogged, and any attempt to use it in such a condition results in failure. If it goes off, a continuous flash of some duration is given, almost always causing a movement of the eyes and features visible in the photograph. The problem that presented itself was to obtain a flash of sufficient rapidity to prevent any involuntary closing of the eyes or contortion of features from showing in the resulting picture. Such a condition of things was only possible with exposures below a thirtieth or a sixteenth part of a second, and, with the apparatus and flash powder shown, this had been brought within possibility. The apparatus consists of a telescopic stand, devised for clamping it to the edge of the table, or other convenient support. On the topmost rod is fixed a platform, which, when large groups are being taken, may be extended on either side by means of secondary detachable platforms. The flash powder, which is an extremely finely ground mixture of aluminium and other ingredients, is laid in a train along the platform, the quantity being regulated by the usual factors. At the back of the platform is fixed a trigger, to which a good-quality Swedish match is attached, while in a receptacle is placed the box, with its frictional side directed to the match in the trigger. The trigger is released, the match strikes the box (turning it aside) and ignites, and the intense heat of the consuming head instantly ignites the train of powder, and the exposure is made. The height of the stand is regulated by the telescopic device according to the distance of the sitter. The usual lights of the room are best kept burning, as they materially help the sitter to retain a natural expression. The powder is one possessing a large degree of safety. Concussion and friction fail alike to produce ignition, an intense heat being required. Rapid plates should be used, and they are best backed. It may be mentioned that Mr. Thiele uses red ochre and starch paste for this purpose. Specimen portraits and groups were passed round to show the capabilities of the apparatus, and on another occasion a group will be taken by means of the lamp. A vote of thanks was passed to Mr. Thiele.

## FUCHS' METHOD OF PRODUCING PHOTO-MECHANICAL PRINTING PLATES.

The new method of producing printing plates is principally designed to be employed for producing deep-etched zincographic plates for use in revolving presses even of the greatest production, as employed in printing daily newspapers. Plates of this kind, hitherto, could only be obtained by the aid of open and deep-cut xylography and by deep-etched pen-and-ink drawing on zinc. Owing to the slow and expensive hand work required for producing such printing plates, no use, or but very little use, could be made of them for usefully illustrating the most recent events of the hour in the daily journals printed by revolving letter presses of highest speed.

The photo-mechanical method of producing deep-etched zincographic printing plates of the kind of deep-cut xylography, as hereinafter described, allows of the reproduction of figurative objects of every kind in a way so quick and cheap as to enable such reproductions to be employed for illustrating the daily journals printed by revolving presses.

The new method of the invention, as stated before, is performed by the employment of a quadruple camera obscura, as represented in the accompanying drawing. A chamber of suitable size, perfectly closed



to shut out all light from outside, is divided into two compartments, 2 and 3, by means of a partition, c, which is conveniently movable, by the aid of rollers or wheels, to or from either end of the chamber. One end wall, a, of said chamber contains an aperture, b, so constructed and arranged as to receive a frame, which contains the original figurative object to be reproduced. Such object must be translucent, and may consist of a negative photograph, or any design, tracing or printing prepared for the purpose, or other translucent picture. The said original is tightly fitted in its frame, and the frame equally tightly placed within the aperture, b, so as to prevent any ray of light from entering into the compartment 2 except through the translucent original. A source of light of sufficient intensity is placed behind the said original, the reproduction of which, through an



objective glass placed in a camera, 1, within the compartment, 2, is projected on an enlarged scale against the partition, c, which contains an aperture holding a pane of translucent glass or other suitable material. The said partition, c, being adjustable to and from the aperture, b, and camera, 1, the size of the projected picture may be easily determined. Opposite to the said aperture of the partition, c, a photographic camera, 4, is placed, adjustable both in height and to and from the said partition, c.

On the opaque pane in said partition, c, appears, as described, the enlarged picture of the original, extending with broad shades, half-tones and lights, and, owing to the interruptions of the small sharp reflections of light, the said picture on the pane resembles, by itself, a perfectly true but enlarged engraved reproduction of the original.

To complete the picture thrown, as described, on the pane of the partition, c, for the requirements of open zincography, a fine screen or screens, v, are placed before or behind, or before and behind the said pane in the partition, c, and thereby the picture thrown on said pane is finely divided and detailed into a net of sharp lines, such as the xylographer obtains by minutest attention, working by hatching and cross-hatching the wood with the aid of gravers.

The picture thus produced on the translucent pane of the partition, c, and subdivided by a suitable screen or screens into a net of fine points, lines, and squares, being suitably adjusted, is subjected to photographic exposure by the camera, 4, within which the said picture is again reduced to any desired scale, and the negative obtained serves for applying the picture to the zincographic plate to be etched in the usual manner.

The method hereinbefore described is adapted to be employed in a great variety of ways, to reproduce drawings and figurative objects of any kind, and in applying a screen or screens, as described, and adapting such screen or screens to the original to be reproduced, printing plates of any kind and description, for plate presses, typographic and lithographic presses, may be produced, not only for the usual journal printing, but also for producing the finest artistic and coloured prints.

### THE SILVER PRINTING BATH.

Those who still print on albumenised paper need to be careful to keep the silver sensitising bath in good order if they sensitise for themselves, which is as a rule the surest way to secure good results; and to compete with other styles of printing it is necessary for everything to be in good order.

First of all, then, we must have suitable water, and see that we dissolve the proper quantity of nitrate of silver. Find out, if possible, from the maker of the paper the proper number of grains to the ounce of water, and, having weighed out the requisite quantity, put a pinch of tow into a glass funnel and press it into the tube, then put the crystals on it and pour the water in, warm, not hot, this melts the silver at once. Now add, for every ounce of water, half a grain of carbonate of magnesia, shake the bottle and allow to stand till clear. The magnesia has a

double duty to perform; it will keep the bath from being acid unless the silver crystals were very much so, and in this case more must be used to render it quite neutral. Secondly, the magnesia will prevent the bath from becoming coloured, especially if the printing room is not very warm.

If the bath becomes coloured by use, the best plan is to pour it into the bottle, retaining the carbonate of silver formed by adding the magnesia, and, if necessary, add a little more, and then stand the bottle in a good light for a day or two, this will throw out the colour and render it white and clear.

To keep up the proper strength of the solution it is a good plan to add a few grains of nitrate of silver for every six sheets sensitised as soon as the six are completed, because, if the bath becomes weak, the prints will be weak.

If the solution in drying runs into drops, the bath is too strong and water must be added; also it is best to float the paper for a shorter time.

If the prints on removal from the printing frame look unusually red and flat, the bath is too weak; but, if the shadows show a brassy lustre, the bath is too strong. In either case it is important to correct it before another sheet is sensitised. If too weak, throw in a small quantity of silver nitrate; if too strong, add a little water. Experience will soon show the proper quantity.

The best way to dry the sheets is to fix flat strips of cork along a wall opposite to the fire in the printing room, and pin the sheets to it by the two top corners with black pins, as these do not stain the paper in any way; common pins will reduce the silver to the metallic state, and often make spots and streaks; one corner should be the lowest, in order to drain the sheet, and a saucer or trough should be under it to receive the drainings. This solution should be either returned to the stock bottle, or, what is better, it should be put into a separate bottle and placed in a strong light for some days to clear itself, which it will soon do, and may be filtered off clear and white; it may then be added to the stock.

After prolonged use, it will be found well to throw an old bath down as chloride of silver with common salt, and send it to the refiners with other residues, and it is well to add to the bath before the salt a few drops of a solution of bichromate of potash; this makes the solution brick red, and a saturated solution of salt is now to be added till the red is destroyed. The red or pink tint will remain till all the silver is turned into chloride of silver.

ALFRED SEELEY.

### THE PHOTOGRAPHIC SURVEY OF SURREY.

At the Technical Institute, Redhill, on Tuesday, May 2, an interesting meeting was held under the auspices of the Redhill and District Camera Club, and in connexion with the proposed Photographic Survey of Surrey. The paper prepared by Mr. Geo. Scamell, the Hon. Secretary of the National Photographic Record Association, was read by Mr. J. Sterry, the Vice-President of the Club.

The paper stated that the object and value of obtaining a series of permanent photographs for historical reference was now sufficiently understood and acknowledged, and it was therefore needless to dwell on that point; but if there should be any doubt as to whether any object or scene were worth recording photographically, one could ask the question, "What would be the present value of a photograph of such a class of subject taken, say, a century or more ago, if such had been possible?" for example, how much the interest of Pepys' Diary would have been enhanced if illustrated with photographs of the customs, people, and places of the period. If such would prove of interest to us, we might be sure that similar ones of our own time would prove valuable to those who came after us; the trivial subjects of to-day might become of the greatest value years hence. The value of record work being acknowledged, it was to be hoped that, before long, photographic survey work would be taken up by every county in Great Britain. One of the first, if not the first, of the societies formed for the purpose was the Warwickshire, and since then it had been followed by societies in Yorkshire, Somersetshire, Worcestershire, and Guildford, and also by the congress of the archaeological societies in connexion with the Society of Antiquaries, the Committee for the Survey of the Memorials of Greater London, and by the National Photographic Record Association. This Association was started in London by Sir J. Benjamin Stone in July 1897, and a committee was formed to carry out the objects of the Association, viz.: To establish a national collection of photographs to form a record of existing objects of interest throughout the British Isles, the same to be deposited in the British Museum for public reference. The scheme allowed a very wide scope, as every class of subject or object that might be of use to the future historian or man of science would be included. Ethnological subjects should have special attention, such as dress, occupations, amusements, local customs or celebrations. In particular, records should be secured of such customs as are in a state of transition (such as the use of the flail, the plough, the churn, &c.), street scenes, various methods of locomotion, sailing and steam-ships, and railway rolling stock. All these were suitable subjects for photographing. Abundant work would also be found in the architectural details of our old cathedrals, among the ruins of our ancient castles and abbeys, in old and modern churches, in old monuments and the inscriptions upon them, ancient mansions, old manor houses, tithe barns, labourers' cottages, village scenes, &c.,



as well as illustrations of the homes of the present generation; also any interesting archaeological subjects, including old manuscripts and articles of general or domestic use. Photographs of objects of natural history, and of landscapes or geological features would also be accepted, while the photographing of portraits of celebrities, already begun by the Warwickshire Society, might also prove of great value in times to come.

Besides the workers who might take and collect photographs, there were those who, though not photographers, could help by preparing a list or register of objects of architectural, historical, or archaeological interest in their neighbourhood, by making known the observance of any local custom or ceremony, and particularly by calling attention to the threatened destruction of any ancient building or monument. There was also another class who could render valuable help, namely, those photographers who possessed—as no doubt many did—a large number of negatives. If they would only look through their stock, no doubt a mine of wealth would be brought to view that was now hidden and useless. An important part of the work was to promote the interchange of experience as to the best method of working the survey societies, to prevent the overlapping and duplicating of work, and to ensure uniformity of result. For the purpose of organizing the work, it would be convenient to divide the country into districts, which might well consist of counties, and these, in their turn, might be subdivided when necessary. It might also be desirable to introduce a union of two or more counties into provinces, such as the Northern, Western, Welsh, &c. In each of these districts a strong central committee would be formed, consisting of representatives of the various photographic, archaeological, antiquarian, and other societies, whose business it would be to take the general direction of the survey, to form local committees, divide the country up into districts, arrange for the work of the various photographic societies or amateurs who might be willing to assist, prepare a list of objects to be photographed, and perhaps arrange for an annual exhibition before sending the photographs to the museum.

A number of photographs were then shown by the aid of the lantern. Among the pictures were photographs of the Old Inn at Chiddingstone, the Kew Bridge, which is about to be removed and replaced by a handsome structure more in accord with the requirements of modern times, and the old lock and foot bridge at Richmond. Old cottages at Smallfields were mentioned as well worth photographing, as also were the old cottages in West-street, Reigate, which seem likely to be removed. An interesting and amusing set of photographs were those depicting street hawkers and small traders, such as newspaper boys, purveyors of cats' meat, muffins, chestnuts, &c.

In the course of a short conversation which followed, Mr. Penfold produced an interesting photograph of a portion of Reigate taken thirty-five years ago, and also a sketch of an old dungeon which has been discovered under the old Reigate Town Hall, and which, apparently, was built about the thirteenth century. Mr. Penfold also mentioned that there were a few old prints of Reigate still extant which might be photographed.

#### A NEW WEIGHTS AND MEASURES BILL.

We are indebted to our contemporary, *The Pharmaceutical Journal*, for some particulars of Mr. Bousfield's Weights and Measures Bill, which does not violently disturb the existing Acts of 1878 and 1889, but it supplements them to a very considerable extent. "Cased" weights—that is to say, lead or pewter weights cased with brass, copper, or iron, as provided by Section 30 of the principal Statute—are to be abolished, and their use made illegal, presumably because the material and mode of construction of such weights are considered likely to facilitate the commission of fraud. Compulsory periodical reverification is another of the points which the promoter of the Bill deems expedient for the protection of the buying public, and he proposes that the Board of Trade shall prescribe regulations for ensuring that all weights and measures and weighing instruments used for trade shall be reverified not less than once in three years. It may be anticipated that considerable opposition to this proposal will be forthcoming from traders, and perhaps from local authorities, for few retailers will view with philosophic equanimity the prospect of additional visits from public officers of the inspector type, and, on the other hand, local authorities are not, as a rule, prone to regard with favour projects involving increased expenditure.

True, reverification will cost the trader nothing if his stamped weights be found correct, but a much larger number of inspectors and reverification officers will be needed to see that the law is properly carried out, and multiplication in this connexion cannot be recommended. From internal evidence there is reason to believe that the Bill is inspired by the Incorporated Society of Inspectors of Weights and Measures, in conjunction with the manufacturers of weighing and measuring instruments, and, if this assumption be correct, the measure would be invested with a heightened value as embodying the opinion of experts. The Bill would not interfere with weighing instruments used for scientific purposes and not for trade, but it proposes to bring Post Office weights and scales within the scope of the Weights and Measures Acts.

#### THE DERBY EXHIBITION.

We append a list of the names of those who have accepted the invitation to exhibit at the forthcoming Derby Exhibition.

The Exhibition will open about June 6, and exhibits from the London district will be called for by the agents, Messrs. Bourlet & Sons, 17, Nassau-street, W., on May 31 or June 1, or at any time before those dates if a post card be sent to them. The last day on which exhibits from any part of the country will be received at Derby is Friday, June 2. Carriage both ways will be paid by the Corporation. There will also be a section confined to the members of the Derby Society, which will be largely supported.

The Exhibition will remain open three weeks and close not later than Saturday, July 1.

The frames will be handled and packed at Derby by experienced men who are accustomed to handle the thousands of pounds' worth of pictures sent every year to the recurring exhibitions in this gallery.

Names of photographers who have accepted the invitation to exhibit at the Derby Corporation Photographic Exhibition, June, 1899:—

Wm. Crooke.	Harold Baker.	Hay Cameron.
Chas. Job.	W. Smedley Aston.	Jno. Carpenter.
Karl Greger.	J. Crawys Richards.	J. Gunston.
J. H. Avery.	J. Page Croft.	W. Rawlings.
J. Craig Annan.	T. Morley Brook.	W. A. J. Hensler.
A. Horsley Hinton.	Rev. F. C. Lambert.	Geo. Hankins.
Viscount Maitland.	F. A. Bolton.	Geo. Bankart.
Percy Lund.	S. L. Coulthurst.	Ernest Marriage.
W. Thomas.	Dr. Llewellyn Morgan.	H. W. Bennett.
F. M. Sutcliffe.	John Bushby.	C. F. Inston.
John Westworth.	T. Lee Syms.	A. J. Jeffreys.
Paul Martin.	Fredk. Hollier.	J. H. Coath.
Miss Muriel Bell.	M. Tuke Tylor.	F. H. Evans.
W. D. Welford.	W. T. Greatbatch.	J. B. B. Wellington.
Mrs. Welford.	Fred. Marsh.	A. Brothers.
Reginald Cragie.	W. Edgar.	R. L. Warham.
C. S. Baynton.	Percy Lewis.	S. B. Bolas & Co.
E. Evelyn Barrow.	J. Kearney, jun.	J. A. Sinclair.
Alex. Keighley.	Rev. C. F. L. Barnwell.	

Mr. F. M. Sutcliffe, of Whitby, has promised to act as Judge in the Local Section.

#### PHOTOGRAPHERS' BENEVOLENT COMMITTEE.

A MEETING of the above Committee was held on the 3rd inst. at the Photographic Club.

Among the cases was that of a photographer who, through illness, had become an inmate of an infirmary. Having the necessary apparatus, on his recovery he simply needed a few pounds to enable him to obtain materials with which to start work. The money required was voted.

The case of a photographer, to whom a small weekly allowance had been temporarily granted, was further discussed, and the Honorary Secretary was directed to make inquiries as to whether a home could be found for him on payment of a small sum per annum. The Hon. Treasurer made a report concerning the orphan child, for whom an annuity has been purchased, which, together with the contributions of a gentleman who has interested himself in her, will enable her to be kept and educated for the next ten years.

A case of want through serious illness was also dealt with, and, as this appeared to be one of the most deserving applications that had come before the Committee, a sum for relieving the immediate necessities was granted, and the case referred back for further considering how assistance might best be given.

#### Our Editorial Table.

##### BURTON'S MODERN PHOTOGRAPHY.

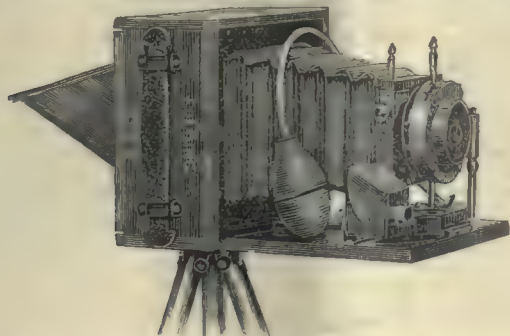
Twelfth edition. 206 pp. Price 1s. London: Carter & Co., 5, Farnival-street, E.C.

This is really a new edition and not a mere reprint of Burton's very popular little book. As we turn over its well-written pages we can mark the parts where the pruning knife has traced a sharp course and new matter has had to be written in. Some chapters on amateur dry-plate making, which were a feature of previous editions, have been omitted, and there are several pages devoted to new lenses. But, for all the care which has been expended on its revision, so rapidly does photography move nowadays, that the up-to-date London reader must regard even Burton's book as somewhat behind the times, Velox, ammonium persulphate, and other recent departures in practice not being mentioned. These omissions, however, can hardly rank as drawbacks to the general reader, and do not detract from the solid value of Burton's book, which, in virtue of the sound and well-digested information it gives on practical photography, takes rank as a classic.



## THE FOLDING APEK.

Agent: WILFRED EMERY, 8, Dyne-road, Brondesbury, N.W., and 3, Soho street, W. The latest production in this elegantly made series of cameras has been shown us by Mr. Emery. The No. 0 is a 5 x 4 camera, hand or stand, measuring when closed only  $2\frac{1}{2} \times 6\frac{1}{4} \times 5\frac{1}{4}$  and weighing 1 lb. 13 ozs. It



is fitted with a single lens of excellent quality and a pneumatic shutter giving three speeds, i.e. time, bulb and variable instantaneous exposures. The price complete with three double slides and leather case is 50s. A careful examination of the camera and its movements convinces us that it is excellent value for the money, and can be recommended for its special purposes.

## SPECIMENS OF TRADE PRINTING, &amp;c.

Catherall & Prichard, Limited, 326, Camden-road, N., and Chester.

MESSES. CATHERALL & PRICHARD, the well-known view-publishers, to whose stereoscopic slides we recently had occasion to make favourable reference, inform us that they have added to their business a department for trade printing and negative-reproducing in addition to other kinds of work for the trade. They have been good enough to send us some samples of their work, prints taken from a day's toning of about 100 sheets and duplicate negatives from stock. The prints are on ordinary albumenised paper, which Messrs. Catherall & Prichard say they find their customers prefer to chloride.

These neatly mounted prints are mostly of whole-plate size and have a pleasing variety of tone. The subjects are landscape and architecture, and in the corners of some of the prints we see the honoured name of "Bedford," at one time a very potent force in professional photography. We have no hesitation in saying that, as specimens of clean, well and evenly toned albumen paper printing, we have never seen anything better than the samples Messrs. Catherall & Prichard have sent us. By a happy inspiration the firm ask our acceptance of a set of four negatives, two landscape, two architectural. Very rarely indeed do little offerings of this nature find their way to this table, which in its time has borne the weight of a vast number of spoilt negatives and prints. Of the very beautiful negatives we are here acknowledging, the best deserved thing we can say is they are so good that they are fit to show many a photographer what he should aim at in definition, gradation, and brilliancy of image, and freedom from the smallest trace of fog or veil. We wish Messrs. Catherall & Prichard success in the new department of their business.

We have also received the Kodak and general price-list for April; Royal Ascot, a Visit to the Royal Ascot Hotel; catalogue and illustrated description of the Biokam (the Warwick Trading Company, Warwick Court, Holborn); and *Dix Leçons de Photographie*, by E. Trutat (Paris: Gauthier-Villars).

## News and Notes.

PHOTOGRAPHIC CLUB.—May 17, "Flower Photography," by Mr. H. T. Malby.

ROYAL PHOTOGRAPHIC SOCIETY.—Photo-mechanical Meeting, Tuesday, May 16, at 12, Hanover-square, at eight p.m. "Specimens of work with Irregular-grained Screens," &c.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On Thursday next, May 18, Mr. Child Bayley will read a paper on "Exhibitions, Technical and Otherwise." The Hon. Secretary will be pleased to see any one interested in the subject. Meeting at eight o'clock. Visitors are always welcome.

A LOCOMOTIVE head light using acetylene gas has been devised by a Canadian inventor. The apparatus consists of a cylindrical cast-iron generator, five inches in diameter and twelve inches long, together with a water reservoir and condenser. The charge consists of about ten pounds of carbide, which is put in a wire basket and placed inside the generator. The water from the reservoir, dropping on the carbide, generates the gas, which is led through a small pipe in front of the reflector.

MR. F. AHRLE, Managing Director of the Metallic Photo-printing Syndicate, Limited, Limes-avenue, New Southgate, N., writes us: "At the meeting which was held on Tuesday last, May 2, and at which I presided, it was resolved that the Syndicate be voluntarily wound up, with a view to form a large company to work the process. We found that the capital of the Syndicate was too small, but the process finds support and admiration enough to warrant our bringing it out on a larger scale."

POLARISATION EXPERIMENT.—Mr. J. Cook writes to *Nature* that, by the following simple arrangement, a single pile of glass plates may serve at once as polariser and analyser, and be used to study or to exhibit on a screen the interference colours with mica or crystal sections. It may not be new, but he has not seen it given anywhere. A beam of light is reflected down from a pile, polarised in the plane of reflection. Passing through a double-refracting crystal, it is resolved and then reflected by a common mirror under the crystal. On passing through the pile, which polarises by refraction in a plane at right angles to the plane of first polarisation, it shows the interference colours. Using sunlight, and interposing a convex lens, we may by this simple means project the interference rings of crystal sections.

ADAPTATION OF LEAVES TO THE INTENSITY OF LIGHT.—The term "photometric" is proposed by Professor J. Wiesner for those leaves which assume a definite position in light, either in order to obtain as much illumination as possible, or to screen themselves from too much light, those which do not possess this property being "aphotometric." Photometric leaves, again, may be "euphotometric" or "panphotometric," according as they adapt themselves only to the maximum of diffused light, or to both direct and diffused sunlight. The former are characterised by assuming a fixed position, at right angles to the direction of the strongest diffused light, while the latter have no such fixed position. The vegetation of forests and those plants which grow in deep shade present the most frequent and clearest examples of "euphotometric" leaves.—*Biologisches Centralblatt*, 1899, p. 1.

THE ART STUDENTS' PROTEST.—A meeting of art students, convened by the pupils at Slade School, Gower-street, was held on Saturday, May 6, at 20, Fitzroy-street, to protest against the decorations now being carried out at St. Paul's Cathedral by Sir William Richmond. Not twenty students were present. These came from the Academy, Westminster, South Kensington, Birkbeck, St. Martin's and Slade Schools. Mr. Max West (Secretary) presided. The Chairman said that what was proposed to be done was to form an executive committee, which should draw up a memorial for presentation to the Dean and arrange for a procession or deputation. Several of the students having condemned the scheme of decoration, the Executive Committee was appointed to draw up the protest and arrange other matters. Various schools are represented on the Committee. Novelty was lent to the meeting by a stranger entering the room and protesting against any "Romanising movement." He declared himself a follower of Mr. Kensit, and was hissed for his trouble.

NOTES FROM THE WEST OF SCOTLAND.—What promises to be an important new function in relation to photographic exhibitions in the West of Scotland is announced in connexion with the forthcoming Horticultural Society's Show in St. Andrew's Hall, Glasgow. Photography hitherto at flower shows has been unknown, but this year will see a fine collection of fruit and flower studies on view at this very large and popular Show. A strong and influential committee has been appointed to look after the Photographic Section, and the scheme is evidently being assisted by the West of Scotland Photographic Association, several of the more prominent members of which are on the Committee as well as being Judges.—What must be termed a very bold and striking form of advertisement has been adopted by the enterprising firm of Messrs. Rae Brothers, who some time ago took over the business of the late Mr. James More, the show-window in Renfield-street having been handed over to a local firm of decorators, who have draped the entire framework of the window in a very artistic manner. The Messrs. Rae have made a very striking display of cameras, hundreds of which, in every size and shape and form, are literally crammed into the available space, the result being a sufficiently strong attraction to arrest the attention of large crowds of passers-by. The idea has caught on.—Already the air is full of rumours of various schemes in connexion with the 1901 International Exhibition, in which photography will require to play an important part. Printers and process-block makers are already feeling a distinct improvement in business over this function, and several bold advertising schemes are talked about which will help photography considerably. The whole undertaking will be a very much larger affair than that of eleven years ago, when, on an average, upwards of 100,000 visitors attended the Exhibition daily.

ROYAL INSTITUTION: FORTHCOMING CENTENARY CELEBRATIONS.—The Annual Meeting of the members of the Royal Institution was held on the first inst., the Duke of Northumberland (President) presiding. The annual report of the Committee of Visitors for the year 1898, testifying to the continued prosperity and efficient management of the Institution, was read and adopted, and the report on the Davy-Faraday Research Laboratory was also read. Fifty-eight new members were elected in 1898. Sixty-three lectures and nineteen evening discourses were delivered in 1898. The books and pamphlets presented in 1898 amounted to about 271 volumes, making, with 659 volumes (including periodicals bound) purchased by the managers, a total of 928 volumes added to the library in the year. Thanks were voted to the President, Treasurer, and the Honorary Secretary, to the Committee of Visitors and Managers, and to the professors, for their valuable services to the Institution during the year. The following gentlemen were unanimously elected as officers for the ensuing year:—*President*: The Duke of Northumberland.—*Treasurer*: Sir James Crichton-Browne.—*Secretary*: Sir Frederick Bramwell, Bart.—*Managers*: Sir Frederick Abel, Bart., Sir William Crookes, the Duke of Devonshire, the Right Hon. the Marquis of Salisbury, the Right Hon. the Earl of Halsbury, Dr. W. C. Hood, Professor D. E. Hughes, the Right Hon. Lord Kelvin, G.C.V.O., Messrs. A. B. Kempe and H. Leonard, Sir Andrew Noble, K.C.B., Messrs. A. Siemens, B. W. Smith, W. H. Spottiswoode, and Sir Henry Thompson, Bart.—*Visitors*:



Messrs. W. H. Bennet, A. Blyth, M. Horner, E. Kraftmeier, Lt.-Col. L. W. Longstaff, Messrs. F. McClean, H. F. Makins, L. Mears, Dr. R. Messel, Messrs. L. M. Rate, J. C. Ross, W. J. Russell, A. G. Salamon, Sir James Vaughan, and Mr. J. J. Vesey. His Grace the President announced that in the month of June next the Royal Institution of Great Britain would complete one hundred years of its existence, the first meeting of its members in the building in Albemarle-street having been held on June 5, 1799. The managers had decided that this event, so interesting and memorable in the life of the Institution and in the history of science in this country, should be duly celebrated. They had, therefore, arranged for the delivery of two commemoration lectures. The first of these lectures would be delivered at three o'clock on Tuesday, June 6, by Professor Lord Rayleigh, when His Royal Highness the Prince of Wales, Vice-Patron of the Institution, would preside and receive the Honorary Members; the second of these lectures would be delivered at nine o'clock on Wednesday evening, June 7, by Professor Dewar, when His Grace the Duke of Northumberland (President of the Institution) would preside. It was further announced that the Lord Mayor had, in the kindest manner, consented to give a reception to the members, foreign guests, and representative men at the Mansion House on the evening of June 6.

## Patent News.

THE following applications for Patents were made between April 24 and April 29, 1899:—

CAMERA STANDS.—No. 8519. "Improvements in Supports for Photographic Cameras." W. DEWAR.

FINDERS.—No. 8637. "Improvements in Photographic Finders." W. W. BEASLEY.

PHOTO MECHANICAL PROCESS.—No. 8695. "Improved Photo-mechanical Process for the Production of Finished and Plastic Casts." Complete specification. C. PIETZNER.

SHUTTERS.—No. 8699. "Improvements in Photographic Shutters." A. J. JONES and L. JONES & Co., LTD.

X-RAY APPARATUS.—No. 8934. "Improvements in and relating to Röntgen-ray Apparatus." J. M. DAVIDSON.

ANIMATED PHOTOGRAPHY.—No. 8973. "Improvements in or relating to Animated Photographic Apparatus." T. E. TAYLOR.

LANTERN SCREENS.—No. 9005. "Improvements in Magic-lantern Screens." T. MORTON.

PHOTO-PROCESS PLATES.—No. 9017. "The manufacture of Photo-process Slabs or Blocks." Complete specification. A. SCHÜTTE.

PRINTING APPARATUS.—No. 9058. "Improved Apparatus for Printing from Photographic Negatives." H. L. MOREL.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
13.....	Oldham .....	Excursion: Manchester Cathedral and Chetham's Hospital. Leaders, J. A. and A. Newton.
15.....	Bradford Photo. Society .....	Carbon Printing. F. Cowburn.
15.....	Richmond .....	Annual General Meeting.
15.....	South London .....	Lantern Evening: Prize Slides, 1898.
16.....	Gospel Oak .....	"Cathedral" Hand Camera. Mr. McKellen.
16.....	Hackney .....	Some Recent American Work. Mrs. C. Weed Ward.
16.....	Iale of Thanet .....	Some Bits of Old Thanet. W. H. Hills.
16.....	Leeds Photo. Society .....	Social Evening.
16.....	Royal Photographic Society .....	Specimens of Work with Irregular-grained Screens.
17.....	Croydon Camera Club .....	The Framing and Mounting of Exhibition Prints. Hector Maclean, F.R.P.S., &c.
17.....	Photographic Club .....	Flower Photography. H. T. Malby.
18.....	Hackney .....	Excursion: Hampstead Heath. Leader, W. A. J. Hensler.
18.....	London and Provincial .....	Exhibitions, Technical and Otherwise. R. Child Bayley.
19.....	Croydon Microscopical .....	Prize Slides.
20-22 .....	South London .....	Excursion: Farnham. Leader, F. Goddard.

### ROYAL PHOTOGRAPHIC SOCIETY.

MAY 9,—Ordinary Meeting.—The Right Hon. the Earl of Crawford, K.T., F.R.S. (President), in the chair.

#### BUSINESS.

Two new members were elected and seven candidates for membership were nominated. It was announced that the Mid-Cheshire Society of Art and the Severn and Wye Amateur Photographic Association had been admitted to affiliation.

#### THIN DIAPHRAGMS.

Mr. J. STERRY, referring to the recent demonstration, by Mr. Bolas, of the making of glass diaphragms, thin to Newton's "very black" stage, showed

some varnish films, made by Mr. Glew, exhibiting Newton's rings of colour and also to the black stage. Mr. Glew used very thin celluloid varnish, dissolved in amyl acetate; two or three drops of the varnish were put upon the surface of a saucer of water, and in a few minutes the colours appeared, when the film could be lifted by means of a ring of wire and placed upon any material. Mr. Sterry said the process was very simple, and he had made several of the diaphragms himself; they were very strong, and could be easily handled on the wire; but one could not exactly tell whether the varnish would spread sufficiently, and the colours varied in each diaphragm.

#### PRESENTATION TO MR. CHILD BAYLEY.

The PRESIDENT said that, before the business of the evening was proceeded with, he had to perform the pleasant duty of handing to Mr. R. Child Bayley an illuminated address, signed by a large number of members of the Society, together with a purse, in recognition of the zeal and energy which he had displayed in furtherance of the interests of the Society during his six years' tenure of office as its Assistant Secretary. His Lordship alluded particularly to Mr. Bayley's valuable services in connexion with the Exhibition at the Crystal Palace, and said that the success of that important undertaking was largely due to his untiring efforts.

Mr. CHILD BAYLEY, in acknowledging the presentation, said that the recollection of the kind treatment which he had always received at the hands of the members and official chiefs of the Society would remain with, and be cherished by, him as long as he could remember anything at all.

#### THE PHOTOGRAPHY OF COLOUR.

Mr. E. SANGER SHEPHERD read a paper on "The Photography of Colour," in which he dealt with those branches of the subject having reference to the representation of a coloured object in a monochrome print, and the representation of a coloured object in its natural colours by the three-colour printing process. The paper was an account of the improvements and simplifications which had been introduced with regard to the translation of colour into monochrome, and the triple printing methods, since June last, and the adaptation of those processes to commercial ends. It commenced with a description of Captain Abney's scheme for adjusting colour screens to sensitive plates for representing each colour according to its luminosity, and gave detailed experiments in this direction, the result of which was that a screen had been obtained which, with Cadett's rapid spectrum plates, would exactly represent the colours in any object according to their luminosities. In landscape photography all cloud detail could be secured, and within the range of printing density, but the exposure was increased forty times; the plates referred to, however, were so exceedingly rapid that an exposure of fifteen seconds with *f*-22 in a not very bright light was sufficient for one of the examples shown. A very pale yellow screen, increasing the exposure twice, would largely reduce the action of the blue and ultra-violet, and produce a marked improvement in the rendering of greens and skies in ordinary landscape work. Mr. Shepherd, after referring very fully to this branch of the subject, adverted to the three-colour printing process, the principles of which he explained, and showed some very fine slides by Mr. Saville Kent. He dealt also with the application of Captain Abney's sensitometer to the adjustment of the screens for three-colour work, and with methods and apparatus for the production of blocks for the type-printing press. With regard to the difficulty of ensuring accurate register, he said that a press had recently been invented which would print the three impressions at one operation. The three half-tone blocks were mounted on a revolving cylinder, and inked in turn, the three impressions being made one on top of another on a metal plate, from which all were taken up at once by the paper. The rollers could be adjusted by micrometer screws, so that absolute register was obtained, and, as all the colours were received by the paper in one operation, the difficulties entailed by separate printings were obviated.

Mr. CHAPMAN JONES, Mr. W. E. DEBENHAM, Mr. LOVIBOND, Mr. SAVILLE KENT, and Mr. WARBURG took part in the discussion which ensued, to which Mr. SANGER SHEPHERD replied.

#### COMING EVENTS.

May 16, Photo-mechanical meeting; exhibition of specimens of work with irregular-grained screens. May 23, Technical Meeting. "Korea," by Mrs. Isabella Bishop. June 13, Ordinary Meeting. "Acetylene," by Professor Vivian B. Lewes.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 4.—Mr. Philip Everitt in the chair.

The Chairman passed round one of Thorpe's direct-vision spectroscopes, composed of one prism, upon one end of which was attached a celluloid copy of one of Rowland's gratings, with 14,300 lines to the inch. In such a manner it becomes possible to make a small pocket spectroscope of considerable dispersion, which, for size and efficiency, would compare well with the usual direct-vision spectroscope of three or five prisms.

The HON. SECRETARY read a paper contributed by Mr. W. T. Wilkinson under the title

#### EXPOSURE AND DEVELOPMENT.

The author laid down two important factors in the production of technically perfect negatives, viz., correct exposure and suitable development. By exposing for the shadows and allowing the lights to take care of themselves, and following this with a judiciously mixed developer, it becomes possible to obtain a rendering of the subject true in every respect. To facilitate the estimation of the correct exposure, the possession of an exposure meter was stated to be as much a *sine-quid-non* as was the focussing cloth or the ground glass; but the meter used must be one which requires an actual test of the light at the time of exposing. Exposure tables cannot be of much service, because they do not allow for the ever-changing actinic value of the light. The presumption that at a given time of day in a given month the light may be represented by a certain factor is an unreliable guide, and the author



mentioned an instance in his own experience where the "table" exposure worked out at only one-fifth that indicated by the meter, and another where the error was on the other side. Hap-hazard exposures required the exercise of all the faculties in developing to discover the amount of exposure, whether over or under, whereas, with plates exposed correctly by meter, they may be developed with some degree of certainty of the result. By modifying the pyro-soda developer according to circumstances, the statement of the textbooks that it is the best all-round developer may be true for seventy-five per cent. of subjects, but for the remaining twenty-five per cent. any pyro formula is indisputably bad. For normal exposures and subjects, that is to say, pyro soda may be the best, but for abnormal cases—snap-shots, interiors, &c.—the more modern reducing agents are preferable. Pyro has certain characteristics, and metol, for instance, has others, and by blending the two results may be obtained not otherwise possible. Halation that would appear with pyro would be less conspicuous with metol, or even abolished. Metol-quinol was mentioned as a good developer, but more visual density was necessary than with pyro. In fact, pyro in small traces forms a good addition to either metol or metol-quinol, on account of the slight colouration it induces. Its characteristic colour forms one of the chief reasons why pyro holds its ground against the newer comers.

A discussion ensued as to the use of the actinometer. Opinion was about equally divided for and against those involving the actual test of the light by exposure of paper thereto, and those where the power of light was visually estimated.

The CHAIRMAN was against the test by exposing paper on the ground that the value of the light may alter very appreciably between test and actual exposure of the plate.

Mr. H. C. RAYSON pinned faith to the guidance of such meters, however, and said that surely fluctuations of light value could be allowed for when exposing.

The discussion veered round on to the matter of sulphite in the developer, Mr. TEAPE finding that solutions containing a given quantity of sulphite after a time failed to give the same blackness of image, although the solution had undergone no change in appearance. Sulphite solution, by keeping, gradually lost its power of yielding black deposit with a certain quantity of solution.

**Hackney Photographic Society.**—May 2, Mr. W. Rawlings in the chair.—In the course of the evening a lecture was given by the Rev. F. C. LAMBERT, on the subject of

#### SOME EXPERIMENTS IN OPTICS.

The lecturer said he would start with the assumption that there was some one present quite unacquainted with the subject, and he then showed, by some simple experiments, the main facts of ophthalmics and their relation to photography. He showed how, by means of a candle, lens, and screen, the respective distances of all three were dependent on each other; in other words, their relative distances formed what are known as conjugate foci. The photographic lens resembled the human eye in that only one object could be in focus at the same time, but they differed in the method by which another object was brought into focus. With the photographic lens this was brought about by the alteration of the distance of the object; with the eye, the curvature of the lens itself was altered. Among many other interesting experiments shown was one proving that we see upside down. It consisted in looking through a pinhole in a piece of paper at some bright object, holding at the same time a pin, head upwards, between the eye and the pinhole. The pin then seemed to be upside down. Why? The explanation of this was that, in ordinary vision, the lens of the eye throws an inverted image on to the retina, which we by an unconscious mental action reinvert. In the experiment the pin casts a shadow (not an image) on to the retina right way up, and we see this upside down through the aforesaid involuntary and unconscious habit of inversion. Experiments were also shown to illustrate the effect of irradiation. This occurs when a bright object is seen against a dark background, the result being to make the bright object seem larger than it really is. An example of this is to be seen with the new moon, the thin crescent of bright light seeming to bulge out from the dark disc. Other experiments of important bearing on practical photography were those illustrating the effects of contrasts. Dark objects have the effect of making adjacent light objects seem lighter and *vice versa*. Thus a weak print with a dark mount is made weaker, a dark print with a light mount seems to become darker. Besides the contrast of shades there were also those of lines, many examples being shown of the modifying effects of cross lines and how judgment might be deceived thereby.

**Bath Photographic Society.**—At the last meeting the Hon. Secretary handed round a large number of negatives and prints by processes now obsolete. These were produced in the early fifties by Mr. C. Pooley, and the methods were briefly described by Mr. W. Middleton Ashman as each example was introduced. Three specimens were in excellent condition, showing very little to be desired in point of quality. Among the exhibits was the first photo-lithograph from a process invented by Mr. Pooley, and a portrait etched on glass by the fumes of hydrofluoric acid was also shown. The collection was lent by Mr. Pooley, of Bath, and a vote of thanks was passed to that gentleman for his courtesy in sending the pictures to the meeting.

#### FORTHCOMING EXHIBITION.

1899.

May 12, 13 ..... National Trades and Industrial Exhibition, Bingley Hall, Birmingham. Manager, Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### HAND GRENADES AND CINEMATOGRAPHY.

To the EDITORS.

GENTLEMEN,—I hear that in several French provincial towns no cinematograph performances are allowed without the operator being provided with a fire-extinguisher in the form of bottles or grenades, procurable at some central pharmacy, and sealed with the seal of the municipality.

These grenades must be close at hand in a prominent place whilst projecting, and a police officer is bound to enforce the regulation, and seeing to the exhibition being stopped in the absence of the extinguisher.

We all know that these grenades will prevent a fire spreading in nine cases out of ten when applied at its outbreak, and it occurs to me that performers in England will be wise to adopt this cheap and efficacious means of protection against but too frequent accidents.

For those who are not familiar with these extinguishers, already prepared and bottled, I will enumerate those procurable at the large stores: The Imperial hand grenade, Sinclair's new hand fire grenade, the Harden Star grenade, all costing from 2s. to 2s. 6d. a piece; but for economy and facility of carriage sake, when travelling from one place to another, we can carry with us the ingredients in their solid state, making the following solution which is used in Switzerland and the United States and will work well, viz.: An aqueous solution saturated with 3 parts of sea salt, and 4 parts of ammonia hydrochlorate brought to boiling point and then lodged in bottles which, thrown into the fire at its inception, and broken to pieces, will extinguish it at once.

Another solution which I take from the "Enquire within" appears equally good, as it ought to be coming from such a trustworthy source, namely, Take a quarter of a pound of pearlash, dissolve it in hot water, pour it in a bucket of common water and throw into the fire.—I am, yours, &c.,

GEORGE FERNAU.

Bellevue, Montvireon par Sartilly, Manche, France, May 8, 1899.

### A COPYRIGHT DISPUTE.

To the EDITORS.

GENTLEMEN,—My attention has been called to the following in your last issue:—

"COPYRIGHT.—F. T. BLACKBURN says: 'I have taken a photograph of the Salterton Town Band, and the Bandmaster wrote me, giving me permission, on behalf of his men, to copyright same, and your publishers kindly undertook registration for me. I was not paid for photographing them, but have since sold copies to the members of the band. I have every reason to believe that it has been infringed. Have I a clear case?'—In reply: Yes, you have an absolutely clear case, and can impose your own terms."

What does Mr. Blackburn mean by not being paid for photographing our band?

He did it at our request, at his own price, in the usual way of business, viz., that we guaranteed to take not less than eighteen copies, at 2s. each, which he supplied and was paid for. As to the copyright, it was not mentioned when the order was given, but when he brought the proof for our inspection.

Our Bandmaster may have given his written consent, but some of our members are under age, and their parents have never been consulted in the matter.—I am, yours, &c.,

ONE OF THE BAND.

May 6, 1899.

### A SOCIETY FOR PHOTOGRAPHIC PRINTERS.

To the EDITORS.

GENTLEMEN,—With your kind permission I will endeavour to reply to Mr. Willatt. I would say, first, that Mr. Willatt is mistaken in supposing that by organizing the photographic printers alone he would attain conditions similar to those at present existing between the various members of the building trade. He would not, for the simple reason that these desired divisions are a result of the more developed state of that trade, and exist also by mutual agreement.

Allowing the photographic printers organized, they still have no control over the other sections, and consequently the advantages they might derive from organization are inasmuch destroyed. Beyond this, it breaks down that idea of unity amongst the members of the trade which it is the aim of trade unionism to foster—the spirit of common interest, not only between the followers of the same occupation, but also between the whole body of workers productive and distributive.

As regards the photographic printers forming their section, nothing that I know of in the constitution of the National Union of Shop-



Assistants prevents this being done at present. If Mr. Willatt can induce twenty or thirty printers to form a branch, the Secretary would be pleased to give them a start. What, however, would be the practical advantages of having "a union of their own" I do not gather from Mr. Willatt's communications.

In his second paragraph your correspondent attempts to maintain two lines of conduct which are contradictory. He asserts: "There is competition and fighting for berths, and the assistant can't stand out of a berth because he cannot get twenty-five shillings," which is the gospel of "free labour;" he then proceeds to advocate a "photographic printers' union"—a combination which could not possibly recognise the right of a member to work for a 1*l.* weekly when 2*l.* is a fair wage. I faced this difficulty in my last; maintaining that the individual assistant is not free to accept a lower wage than the competition rate, but is compelled to do so by the force of circumstances; that is not freedom, but slavery. To remedy this, it is necessary to organize a powerful combination in order that the assistants may bargain with employers "collectively," and a weak and struggling photographic printers' union is not likely to meet such a demand.

Now, as I have again and again shown, the shop assistants are fighting our battle, and our cause is also their cause. We are at one on—

The abolition of the living-in system.

Reform of the reference system.

Payment for overtime.

Healthy workrooms and shops.

Abolition of fines.

Payment of railway fares by employers, &c.

Why, then, not join in with those who are going in our direction, instead of running a little show "on our own?" Why form a "little rivulet" when we have an opportunity of joining the "great current?"

I am for the "great current," but it is not enough for me to know that I am "bounding on towards the everlasting sea," especially in reference to trade unionism, which is largely a matter of hard finance and business principles. I should have liked to have touched on the *£ s. d.* side of Mr. Willatt's proposal; but, as I have already taken up a considerable portion of your valuable space, I must reserve my remarks until another occasion.—I am, yours, &c.,

JOHN A. RANDALL.

May 7, 1899.

## NORWAY IN JUNE.

To the EDITORS.

GENTLEMEN,—In answer to your correspondent, I should be obliged if you would let me say that as I have been a photographer on a steam yacht sailing from Scotland to Norway during the season of 1897, and also a native of that country, I may be able to give him a few good hints as regards same. In the first place I would advise him to have a few plates taken and developed so that he can see how he goes on. This he can have done on board by the steamer's photographer, and he will also be able to have free use of the dark room for changing plates when not engaged. He should have a good and quick shutter and also plates; as a great number of the views must be taken while the steamer is in motion, I would recommend the Thornton-Pickard double blind shutter as a good one. There will be five or six overland trips, so he will have to be well prepared with plates. Most views should be taken on the trip from Bergen overland and joining the steamer at Gudvangen. He must be careful on this occasion as regards plates, as the finest scenery is near the end of the journey.—The Nærdal Pass. This is a mistake that is often made, and is very disappointing if not prepared for. A few good pictures should be got in the Guranger Fiord, but must be taken while in motion. He will, however, have time to get prepared for this, as the time of passing each place of note will be duly announced on the day's programme. To conclude, a picture should be taken of Tromsø harbour showing the "Midnight Sun."—I am, yours, &c.,

S. SVENDSEN.

55, Conington-road, Morden Hill, Lewisham, S.E., May 8, 1899.

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

H. Colebrook, 5 Grosvenor-terrace, Station-road, Sidcup, Kent.—Photograph of a child in basket entitled "Star Fishing."

A. Weber, 11, Knowsley-street, Bolton, Lancs.—Two photographs of the late Rev. Dean O'Brien, of St. Mary's Church, Bolton.

A. J. Ashbolt, 10, Exmoor-road, Southampton.—Two photographs of group of Southampton Football Team, Southern League Champions, 1896-7, 1897-8, 1898-9. 1. In striped shirts; 2. In white shirts.

GWNFA.—In our next.

C. L.—Very good indeed.

PHOTOGRAPHER.—We think you would be justified in refusing payment.

REGISTRATION.—Yes, by forthwith registering the photograph at Stationers' Hall.

W. L. FIELDHOUSE.—Thanks for your note; no further reference to the matter is needed.

T. EVERITT INNES.—We are obliged for the note and drawing, which we will endeavour to use.

LUCIANUS.—We have not seen any reference to such a paper. It is probably a platinum-toned collodio-chloride surface.

GWALLA.—Better select this JOURNAL for the purpose. The cost of such an advertisement is published in each number.

J. MCKISSACK.—Mr. George Bankart, of West Walk, Leicester, would probably give you a few hints on the subject.

XYLONITE.—T. RUSSELL. Xylonite, in the unmanufactured form may, we presume, be had from the British Xylonite Company.

LUMINOSITY.—1. We believe the light can, with care, be used for both kinds of plates. 2. We should wait until development was complete.

W. J. STEARN.—The *Moniteur* is the only one in any way comparable to this JOURNAL for your purpose. Sorry we can offer no further suggestion.

CURIO.—1. If the patent is valid, you can be proceeded against for infringement. 2. Better negotiate with the patentee. 3. No; it would be an infringement.

DISMISSAL.—C. As you only had a verbal agreement, you are, *de facto*, only a weekly servant, and are therefore liable to be, as you have been, dismissed at a week's notice. The case is a hard one, but there is no remedy for it.

OZOTYPE.—S. CLARY. As you have omitted the manganese salt, as given in the formula by Mr. Manly, you cannot say you have given the process a fair trial. The only palpable cause for your failure that we can give is that you have not followed the formula.

SENSITISING BATH FOR CARBON TISSUE. T. BARKER.—A bath of three and a half to four per cent. is quite strong enough for this time of year. In winter five per cent. would be better, and in summer three per cent. would be preferable. The warmer the weather, the weaker should be the solution.

PATENT.—CAUTIOUS. We cannot say if you would be infringing or not. If the patent has been completed, you can see the specification of it at the Patent Office. If it has not been completed, as the provisional protection was granted more than a year ago, there is no patent, and therefore none to be infringed.

STEREOSCOPIC PICTURES.—J. WILSON. The pair of No. 1 B portrait lenses will do quite well for stereoscopic purposes; but, as you cannot get the centres closer together than three and a half inches, they are hardly suited for taking near subjects, as the relief will appear exaggerated in the stereoscope. Probably, however, by taking a piece off each of the flanges, they may be brought closer together.

SCALE ON LENS MOUNT.—C. BREGAR says: "I have just been given an old portrait lens by Voigtlander, and on the mount is engraved a sort of scale. What is the meaning of that, please?"—The lens is evidently one of the old form that has a chemical focus. The scale is to show the difference between the visual and actinic focus, and the necessary alteration to be made after the lens has been focussed.

DETENTION OF SPECIMENS. SEVERAL TIMES FLEECE writes: "I, like many others, have been fleeced out of several lots of specimens sent with applications for employment. In reply to one advertisement, I know two besides myself who sent specimens, as requested, and none of us could get a single one back. Is not this a matter that the Royal Photographic Society should take in hand, for the protection of helpless employees, and for the credit of the profession?"—It is certainly very desirable that something should be done to put a stop to the cruel fraud, but we do not think it is within the province of the Royal Photographic Society to do it.

SOLUTION OF CHLORO-PLATINITE OF POTASSIUM.—E. G. R. says: "I should be glad if you would inform me whether chloro-platinite of potassium can safely be kept dissolved in distilled water, provided it is protected from light. I have been much troubled in the past by the platinum being thrown down, thus rendering the solution useless for toning purposes. I have hitherto made the solution slightly acid with nitric acid. Perhaps that may be the cause of the trouble."—If the solution is made with pure distilled water, and in a perfectly clean bottle, it should keep well. If the solution be acidified at all, hydrochloric acid would be preferable to nitric acid.

PHOTOGRAPHING A SILVER VASE.—H. T. HILLHOUSE says: "Please tell me what to use to cover a silver vase with so that I can photograph it without getting any glare; also can you give me a really good recipe for a backing—to cover the back of a plate to prevent halation when taking interiors?"—The surface of the vase may be dulled by dabbing it over with a lump of common glazier's putty. Another plan is to place a piece of ice inside the vase immediately before exposing; the cold causes moisture to condense on the metal and thus dull its surface. A good receipt for a backing is given on p. 1063 of the ALMANAC. Avery's backing, which may be obtained through all photographic dealers, is also excellent.



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## EX CATHEDRA.

OUR reference a fortnight ago to flexoid, a new transparent, flexible support for sensitive emulsions, has brought us a number of requests for fuller particulars of that substance, and we have also been asked to indicate the source whence the new film is to emanate for commercial purposes. The information was given us privately, so that we were unable to answer the questions that were put to us. We may, however, say that we have been promised, in a short while, samples of flexoid suitable for ordinary negative and cinematographic work, so that its commercial introduction may be regarded as imminent.

\* \* \*

WHILE on the subject, we may say that two other substitutes for rollable celluloid film are almost ready to be placed on the market. Hence considerable competition in flexible supports for photographic purposes may shortly be expected. The field available for film photography is an enormously wide one, and, in our opinion, not only will good substitutes for rollable celluloid find ready acceptance at the hands of the public, but celluloid itself will also maintain a great hold for

photographic purposes. At any rate, the conveniences of film photography to vast numbers of photographers are so great, that commercial enterprise in supplying the demand can scarcely meet with an unfavourable response for years to come. At the same time, just as was the case thirteen years ago, when paper negatives were made a great feature of, the consumption of glass plates is still going on unchecked—indeed, their sale all round is on the increase. What more valuable indication could one have of the strong hold on popular favour which photography has undoubtedly secured?

\* \* \*

At that popular place of amusement, the Alhambra in Leicester-square, a distinct hit has been made by M. Rudinoff, a miscellaneous entertainer, who combines the essential qualities of a "screever," a siffleur, and a shadowgraphist. It is true, says a daily contemporary, that the new comer does not work upon pavements with chalks and crayons. He smoke-dries his easel over a gas fire, and by subsequently removing the smoke in patches produces a remarkable study in black and white. Rudinoff is a kind of Whistler—with a difference. It will be obvious from this that M. Rudinoff employs what may rightly be termed a pure carbon process as the basis of his effects. Though having little direct photographic interest, it may be worth while noting that by taking a deposit of fine soot—or carbon—as a ground, and putting in the lights in the manner above indicated, most charming effects are obtained skilled hands. It is a carbon process which relies for success absolutely on the element of "personal control."

\* \* \*

ELSEWHERE in the JOURNAL this week we reprint a paper, read before the Edinburgh Photographic Society by Mr. A. F. Hargreaves, on a photographic printing process in a new permanent colour. Although the author does not enter into the details of his process, it appears that his results are produced on bleached cotton cloth, the colour being absolutely fixed in the cotton filament by the initial application thereto of a mordant and subsequent treatment with another constituent which forms a lake or pigment. We await details of the process with much interest; in the mean time, by the courtesy of our friend, Mr. J. M. Turnbull of Edinburgh, we have had the opportunity of inspecting specimen prints. These may be best described



as of a rich purple colour, and, the surface being bleached cotton cloth, it may be understood that considerable breadth of effect is obtained.

\* \* \*

ACCORDING to the May number of the *Photo-Miniature*, which contains an admirable illustrated article on "The Pose in Portraiture," well worth perusing by professional photographers, Mr. Walter E. Woodbury, who for the past five years has edited the *Photographic Times*, has now joined the Nepera Chemical Company, and will be in charge of the publicity department. The *Photographic Times* will be continued by the same staff who have assisted in the past. The guidance and experience of Mr. W. I. Lincoln Adams will, doubtless, aid from time to time.

\* \* \*

WE have received the ninth report of the Committee on Photographs of Geological Interest in the United Kingdom, from which we take the following extracts: "During the year 250 new photographs have been received, bringing the total number in the collection up to 2001. In addition to this, 44 prints and 14 slides have been given to the duplicate collection, which now contains many representative photographs, so that future additions are likely not to be so numerous, and to consist only of exceptionally good examples of geological phenomena. Northampton is now represented for the first time in the collection, and the following counties and districts are more richly represented than hitherto: Gloucester, Norfolk, Warwick, Westmoreland, Worcester, the Isle of Man, Aberdeen, Ayr, Bute, Banff, Fife, Inverness, and Sutherland. The most important event of the year, from a photographic point of view, is the inauguration of the National Photographic Record Association, under the presidency of Sir J. B. Stone, M.P. The work of this Association is distinct from that of this Committee, as it is mainly limited to *records*, while the Committee aim at securing *typical phenomena* as well as records. The Committee will furnish to the Association each year a list of the photographs of which the Association ought, where possible, to secure duplicates. The Secretary has been elected a member of Council of the Association." Accompanying the report is a circular giving information relative to the collection of geological photographs, and hints as to the selection of a suitable camera for geological field work. This is obtainable of the Secretary of the Committee, Mr. W. W. Watts, Mason University College, Birmingham.

\* \* \*

MR. R. W. CRAIGIE, Hon. Secretary of the Photographic Salon, asks us to announce that the Annual Exhibition of the Photographic Salon will be held at the Dudley Gallery, Piccadilly, for about the usual period, during the months of September and October next. The prospectus and entry form will be issued shortly.

\* \* \*

At the next meeting of the Royal Photographic Society, on Tuesday, May 23, at 8 p.m., at 12, Hanover-square, London, Mrs. Isabella Bishop, F.R.G.S., will deliver a lecture on "Cores," illustrated by photographic lantern slides. We are asked to state that the Society will be glad to see anybody interested in the subject, and that tickets may be obtained on application to the Assistant Secretary.

MESSRS. R. W. THOMAS & CO., of Thornton Heath, write us: "In your issue of May 12, we read that Messrs. R. W. Thomas & Co. were represented at the annual dinner of the Association of Plate and Paper-manufacturers—this of, course is, an error, as our Company retired from the Association in October 1897. If you will kindly insert this, it may save the Association's Secretary and ourselves from unnecessary correspondence." We are sorry for the unintentional inclusion of Messrs. Thomas's name in the list given.

\* \* \*

OWING to pressure on our space this week, we are compelled to hold over several articles including the second on the subject of Colour Facts and Fallacies.

### SULPHITE AND METABISULPHITE.

THE history of the use of an alkaline sulphite as an addition to the pyro developer is replete with contradictions. When its merits were first pointed out by the late Mr. Herbert Berkeley it fell absolutely flat, and it was not till more than a year had elapsed, and after writers in this JOURNAL had pointed out the great advantages gained from its use, that it began to be tried in real earnest by the body of workers. But, all through, a kind of crass fatality attended it. Photographers as a rule would not understand its true functions; they persisted in regarding it as an agent for preserving solutions of pyro from discolouring. This, as we have more than once emphatically pointed out, is a mere subsidiary quality. If that were its only use, there need be no employment of the sulphite, for the addition of a sufficiency of almost any acid would answer all practical purposes in that direction. Its real usefulness lies in preventing or reducing staining of the negative primarily, and of the fingers in a lesser degree. All negatives taken before its introduction were of a terribly yellow colour. We are aware that many photographers affect a preference for yellow negatives, but not such a colour as is obtained when no sulphite whatever is used.

Not content with this ignoring the true function of the salt, a further nebulousness was imparted to the already hazy appreciation of its value by the introduction of a salt, the metabisulphite of potassium, which is commonly listed at a price sixfold that of the sulphite, and which has not one iota of advantage over the less expensive material. We may be told that the metabisulphite is a better preservative than the simple sulphite, but it is not so if the latter be considered from that point of view alone, for by the addition of an acid—citric, sulphuric, &c.—the keeping properties become in every way equal, and, as we say, at a sixth of the cost. Yet the use of the dearer salt is increasing, and in the published formula for a one-solution developer we even actually see it set down, although it is patent to the most casual observer that, when the alkali, carbonate, or caustic, is added, there is actually no difference, chemically, between the resulting compound and one with metabisulphite. One cardinal point to see to in the course of any chemical operation—and such, of course, is the act of development—is that perfect uniformity from day to day is carried out. But how can this be with the employment of the meta salt? Few photographers who mix their own chemicals care to be always weighing their salts; they prefer to have them in solution. But metabisulphite is continually giving off sulphurous acid, even in the crystalline form, while,



if it be kept in solution, the change is more rapid. Hence it is an uncertain quantity when used in the developer, and absolute uniformity, which is so desirable, cannot obtain with its use. It would be no argument to say that, although the meta salt is a dearer one, its cost is neutralised by the smaller quantity used, for it is purely a question of the amount of acid added to the ordinary kind; an ounce of metabisulphite has not any more action in preventing the negative from staining than has an ounce of the neutral salt.

There is one other strange misconception with regard to the standard sulphite, and that is the strength at which stock solutions of it are to be mixed. We have seen recommended all proportions, from twenty to forty per cent. strength; but we unhesitatingly say that in this country no stronger a solution than twenty per cent. should be stored. It is quite true that a twenty-five per cent. can readily be made, but, when the temperature of the solution is reduced to near the freezing point of water, a portion of the salt will crystallise out. Besides, for lovers of the metrical system, twenty is a far better proportion than twenty-five, for it is just double a ten per cent. strength, which is a decimal division dear to the honest heart of the worshipper of the metrical system—a system by no means in general use in the country of its invention, France. We trust that what we have written will be instrumental in bringing into its proper position the value of neutral sulphite of soda and the comparative worthlessness of its supplanter, the metabisulphite of potassium.

**The Lime Light in the Church.**—The Rev. W. Carlile, at St. Mary-at-Hill Church, was the first, we believe, to introduce, some years ago, the lantern into the Church; and it has proved an attraction to the evening services. The subject chosen for last Sunday evening was entitled, "Eighteen pints of beer a day." From six to seven there was a sacred concert with a full band. The Rev. Mr. Carlile is to be commended for his work in this direction. It is noteworthy, however, that the London County Council prohibit this sort of thing, in places of public entertainment under their control, on Sunday evenings. Why?

**Explosion of Chlorate of Potash.**—Photographers and lanternists are not, nowadays, much concerned about chlorate of potash, as they usually obtain their oxygen ready-made, compressed in cylinders. Accidents occasionally happened when they had to generate it themselves from the chlorate, but then they were always attributable to some extraneous matter present, and not to the chlorate itself, which is not, *per se*, explosive. In the recent catastrophe at St. Helens the accident did not arise from handling or dealing with the chlorate, but from a fire in an adjoining building; but why did it explode and produce such devastation? Various theories have been suggested, one of which is that the heat from the fire that preceded the explosion might have caused the formation of distillation products from the timber which, mixing with the chlorate dust, might cause a highly explosive mixture, &c. At the inquest, which at the time of writing has not been held, expert evidence will be called to account for the explosion, and the result will be looked forward to with interest by all who have still to do with chlorate of potash for the production of oxygen.

**A New Explosive (?)**—What one sees occasionally in the lay press is often highly amusing. In a paragraph now before us—in the *People of Sunday* last—it is stated that; "a miner named Waycott, at Crayhead Colliery, Durham, was drying gelatine before his kitchen fire, when it exploded, blowing a portion of his house down." It is the first time we have heard of *gelatine* being explosive. If it is, the dry-plate makers and the manufacturers of P.O.P. should

be careful in future how they handle such a dangerous material; also we should advise them to keep the knowledge of the fact that it is dangerous from the different insurance companies, or they may find their premiums materially raised.

**Fluctuation in the Value of Paintings.**—At Christie's sale rooms, on Saturday last, a *Holy Family*, by Rubens, was sold for 8300 guineas, and another painting by the same artist was sold to the same purchaser (Agnew) for 1950 guineas. This latter work, in 1806, was purchased for 4000 guineas, and a few years ago it was again sold at Christie's for 3800 guineas, and on Saturday it only fetched 1950 guineas—a great depreciation in market value.

**The "Decorations" in St. Paul's.**—Last week we alluded to a protest by art students against the decorations now going on in St. Paul's. Now a memorial from architects has been presented to the Dean and Chapter, protesting against the continuation of the work of decoration until full opportunity has been given for the consideration of the whole scheme by the best expert opinion available. It is to be hoped that this will be done by the Dean and Chapter—and the "Committee of Taste." A memorial from a body of architects, who are naturally proud of Wren's work, should have great weight—much greater than the protests of artists and art students. Wren's masterpiece is at present—or as it left his hands—a thing of beauty. What it may be when the embellishments—if they are carried out—are finished remains to be seen. While on the subject of St. Paul's, we may again remind our readers that the opportunity still remains for them to secure photographs of the Cathedral from Cheapside, which will be impossible in a very short time hence.

#### SILVER SUB-BROMIDE, THE LATENT IMAGE, AND NASCENT SILVER.

[Translated from the *Photographische Correspondenz*.]

PROFESSOR DR. RICH. ABEGG makes the following statement in the *Archiv für Wissenschaftliche Photographie* (vol. i. p. 15): "We find, without exception, in text-books of photography the view expressed that the substance produced by the direct action of light upon silver haloid is a silver sub-haloid. It is difficult to ascertain, in the present condition of photographic literature, who originated this theory, and upon what grounds it was based. We also find the same theory adopted in Eder's *Ausführliches Handbuch* (vol. ii. p. 28, 2nd ed., 1895), and its harmony with our experience is demonstrated. The theory that the substance of the latent image consists of metallic silver is likewise mentioned in the same work, but it is dismissed as unsatisfactory, without advancing any facts in opposition."\*

Professor Abegg then proceeds to remark that the only reaction which is in favour of the silver sub-haloid theory and opposed to the presence of free silver is the indifference of the latent photographic image to nitric acid, which silver sub-bromide will withstand, whilst metallic silver will not.

Upon the basis of an experiment with *gelatino-bromide* plates, Abegg infers that the latent image is destroyed by nitric acid. He advances this experiment as proof of the nascent silver theory (*silberkeimtheorie*)† and infers that metallic silver is immediately formed by exposure to light, and not silver sub-bromide. This metallic silver is supposed to act as a germ in presence of silver bromide and a developer, and effects the reduction of the silver bromide as more or less copious deposits in forming the photographic negative.

The old controversy of the photo-chemist is thus unrolled, whether the image formed by the action of light upon a silver haloid is metallic silver or a sub-haloid. As mentioned in my *Ausführliches Handbuch der Photographie* (vol. ii., 2nd ed., p. 110), the originator of the former theory was Arago (1839), whilst my researches show Choiselat and Batel were the first to maintain (in 1843) that sub-iodide AgI<sub>2</sub> was formed (*Ausführliches Handbuch der Photographie*, vol. ii. p. 111). The statements I have quoted are the oldest I could find in reference to this matter.

Leaving the historical side of the question, I will now refer to the

\* See THE BRITISH JOURNAL OF PHOTOGRAPHY, March 31, 1899.

† Ibid., March 31, 1899, p. 197.



experiments. Strictly speaking, Professor Abegg confines himself to one experiment only, according to the quotation I have made, and upon the strength of this he rejects the sub-bromide theory of the formation of the latent image. This is the action of dilute nitric acid upon the latent silver-bromide image. If the treatment of the latent image with dilute nitric acid destroys capacity for development, according to Abegg's proof the image should consist of metallic silver, because silver sub-bromide withstands the action of nitric acid.

Professor Abegg made this experiment in the following manner: He dipped an exposed gelatino-bromide plate in dilute nitric acid (1 in 15), and he states that the capacity for development of the light impression was almost destroyed; "not completely," adds Dr. Abegg, "because the gelatine protects the silver, and the acid must be very dilute (1 in 15) for preservation of the film."

According to Professor Abegg's own statement the experiment was not completely successful, as there remained, at least partially, a developable latent image, which had resisted the destructive action of the nitric acid. Such an experiment appears to me an unsuitable basis upon which to decide an important photo-chemical question.

In order to decide the question it was therefore necessary to carry out experiments for the destruction of the latent image by means of nitric acid, under much more stringent conditions. If destruction were possible under such conditions,\* doubtless the silver sub-bromide theory would sustain a heavy blow, but, in the contrary case, the sub-bromide theory would derive very important confirmation.

For my series of experiments I selected collodio-bromide films, because these would not be affected by nitric acid of greater strength. In order to ensure direct contact of the silver particles with the nitric acid in their process of formation, bromide of cadmium collodion† was coated upon glass, and the proportion of nitric acid mentioned by Professor Abegg was added to the silver bath. The bath was composed as follows:—

Water .....	300 c. c.
Nitrate of silver .....	60 grammes.
Concentrated nitric acid ( $d=1.35$ ) .....	20 c. c.

Exposure was made with a Euryscope f.6, at full aperture, from 1 to 4 minutes, at 8 to 4.30 p.m., on March 27, in the studio. The light was good, and the subject black-and-white print. Development was effected with alkaline glycin, after excess of silver nitrate had been carefully removed by washing. An excellent, vigorous negative was obtained, and the presence of dilute nitric acid (1 in 15) had not therefore destroyed the latent image.

Successive additions of 60 c. c., 150 c. c., 300 c. c., and even 500 c. c. of concentrated nitric acid ( $d=1.35$ ), were then made to the silver bath. The plates were sensitized and exposed while saturated with these successive acid solutions, but still an image was invariably obtained, although of thinner character.

I also tried to develop the latent image upon these silver bromide films by means of sulphate of iron (as in the wet-collodion process), but as a precaution it was necessary that the enormously acid silver bath should be first rinsed off with a slightly acid one before applying the sulphate of iron developer. An undoubtedly clear, distinct negative was also apparent after development by this process.

It is therefore proved beyond doubt that dilute nitric acid does not destroy the latent image formed in bromide of silver.

If one remembers that the quantity of nitric acid was increased in the course of these experiments until the bath contained more concentrated nitric acid than water (5 parts of nitric acid to 3 parts of water), the immense stability of the substance of which the latent image is formed in the silver bromide is most surprising.

The nitric acid was of such strength in the last experiment that a physically developed image of metallic silver, after being duly fixed and finished, was completely dissolved by the bath in 30 to 60 seconds. It is thus proved that such strong acid solutions dissolve metallic silver, that metallic silver as such cannot exist in them, and likewise that metallic silver cannot be formed in the camera during exposure.

Whatever may be the substance of which the developable latent image

\* According to H. W. Vogel, bromide of silver, blackened by light, is insoluble in nitric acid, but Carey Lea says an appreciable quantity is dissolved. But the discolouration of silver bromide by light is unaffected by nitric acid, consequently sub-bromide is present (Eder). I described the behaviour of silver sub-bromide in these words in *Fehling's Handwörterbuch der Chemie* (1886, vol. iv., p. 113), likewise in my *Ausführliches Handbuch der Photographie* (2nd ed., vol. i. part 1, p. 177).

† Six grammes of bromide of cadmium were dissolved in 70 c. c. of alcohol and added to 100 c. c. of a 2½ per cent. plain collodion. (*Eder's Ausführliches Handbuch der Photographie*, 2nd ed., vol. ii. p. 457.)

is composed, when a film of bromide of silver receives brief exposure to light, it is quite certain that it cannot be metallic silver.

Upon the ground of these indisputable experimental facts, I consider Abegg's opinion "that nascent silver is formed by the direct action of light" untenable; moreover, that the theory of the formation of sub-bromide in the latent image has been greatly strengthened. In conclusion, I may remark that the phenomena of solarisation are easily explained by the sub-bromide theory, and that they cannot be brought into harmony with the idea of the direct formation of germs of metallic silver, which are scarcely accessible to processes of oxidation.

To prevent false impressions, I wish to add that, according to my opinion, the latent image consists of sub-bromide, which is reduced to metallic silver by the developer more easily than unexposed silver bromide. The metallic silver formed during development may then have a secondary action by electro-chemical processes upon the silver bromide, and intensify the negative, as described by me several years ago, and as Dr. G. Bredig has shown (*Eder's Jahrbuch für Photographie*, 1899, p. 357).

But the primary latent photographic image must be taken as formed of silver sub-haloid in the present aspect of the question.

DR. J. M. EDER.

#### TAILORING AT THE ROYAL ACADEMY.

SOME of the R.A.'s and other portrait painters seem to have given dire offence to the tailors by the way they have rendered the garments of their sitters, and our contemporary, the *Tailor and Cutter*, is very severe upon them in the matter. It complains that there is a disregard to seams, irregularly placed buttons, and the use of ornamentation which is altogether grotesque. Several instances are cited in which the Sartors have been outraged. One is the portrait of a gentleman in a black morning coat with flat braid edges, the sleeves of which are too large, and have the appearance of being bound round the bottom, suggestive of the finish of the good housewife who repairs the worn-out cuffs of her husband's coat—good housewife, too, say we. Another example is of a coat which shows but one buttonhole, and that is on the wrong side. In another case it is a double-breasted frock coat, the sleeves of which are too short, and the collar is compared as being more like a horse collar than that of a gentleman's coat. Lord Kelvin's attire is much complained of. It is a morning coat, but one button is described as looking as if it had once been on a heavy overcoat. The breast pocket, too, is placed too low, and the vest is too short, also the watch-chain is on the wrong side. Fault is also found with his lordship's trousers, as they are innocent of seams or any mode of fastening, and the suggestion is made that he must have grown in them. In another portrait our contemporary says the coat is innocent of buttons or buttonholes, and adds that the silk facings are not a true representation of what is being worn. The costume of the Right Hon. Gerald Balfour also comes in for severe criticism. The *Tailor and Cutter* is evidently grieved about these *lâches* on the part of artists, and "is sorry to think that any of these portraits are to be handed down to posterity as a representation of nineteenth-century tailoring skill."

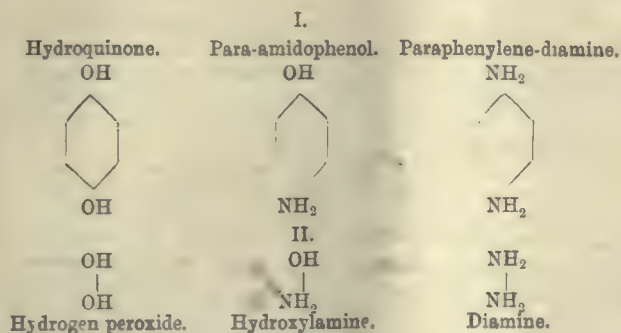
It has frequently been said that a large proportion of the portraits exhibited at the Royal Academy are painted from photographs. If any of those alluded to were, it is pretty clear that the artists have not slavishly followed the details of the photograph as regards the dress, or, it may be those that are actually worn by the gentleman portrayed not in accordance with the prevailing ideas of our contemporary as to what should be worn. Different gentlemen have different ideas as to the style of garments they wear, and how they shall be made for comfort. Possibly that may account for something, so that, after all, the artists may not be so much at fault. Men were not made for tailors, neither were artists. So much the better perhaps, for the comfort of both in their garments.

#### THE USE OF HYDROGEN PEROXIDE IN PHOTOGRAPHY.

IN the current number of *Photographische Correspondenz*, Dr. M. Andersen contributes a paper on the above subject, in the course of which he says that in 1891\* he pointed out a certain similarity of constitution in some of the simplest of the organic developers, such as hydroquinone, para-amidophenol and paraphenylene-diamine on the one side, and the compounds, hydrogen peroxide, hydroxylamine, and diamine on the other. A comparison of the formulæ will show this at once.

\* *Photographische Mittheilungen* (1891), p. 296. *Eder's Jahrbuch* (1893), p. 421.





With the exception of hydrogen peroxide, these compounds are known to be developers in alkaline solution, and with respect to this he stated that, on account of its peculiar double nature, sometimes oxidising and sometimes reducing, he had tried it as a developer as well as a reducer.

He has now made further experiments, and is able to confirm his statement, and has proved that when alkaline it acts as a developer, when acid as a reducer.

His first experiments when using it as a developer gave no results, because he did not use enough alkali. His first experiment was made with 0.5 gramme caustic soda,  $\text{NaHO}$ , to 100 c. c. of three per cent. hydroxyl. When, however, the quantity of soda was increased to 7 grammes to 100 c. c. three per cent. solution hydroxyl, a bromide plate, showing normally 19-20° Scheiner, gave in this developer, in from five to ten minutes, 12° Scheiner without fog.

The formation of the image is accompanied by the evolution of oxygen, which causes blisters in the film, and this makes the practical use of hydroxyl as a developer very doubtful. Gelatino-chloride plates can also be developed with this, although there was a great tendency to general fog, but potassium bromide acted very powerfully against this, and lessened considerably also the tendency to blistering.

The best formula for chloride plates is:—

Hydroxyl solution (three per cent.)	100 c. c.
Caustic soda	2.4 grammes.
Potassium bromide solution (ten per cent.)	3 drops.

A chloride plate exposed 30 cm. from 3 cm. of magnesium wire under a normal negative gave a vigorous and clear image.

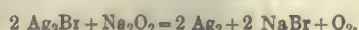
In order to determine what part hydroxyl plays in the development of the latent image, it must not be forgotten that hydroxyl sometimes exerts a strong reducing action, and it will instantly reduce silver, mercury, and gold oxides completely to the metal, and for every molecule of hydroxyl one molecule of oxygen is set free, half of which is derived from the reduced oxide and half from the hydroxyl.

Bromide and chloride of silver emulsified and ripened in gelatine is only reduced, after exposure, by a considerable quantity of caustic alkali; this leads to the assumption that, when one or two molecules of caustic soda are added to a three per cent. solution of hydroxyl, there is, partially at any rate, a formation of sodium peroxide  $\text{Na}_2\text{O}_2$ , and that by this the development is effected. A direct experiment with sodium peroxide confirms the correctness of this conclusion. A solution of

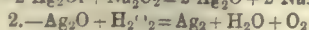
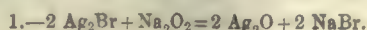
Water	100 c. c.
Sodium peroxide	7 grammes,
Ten per cent. potash bromide	8 drops,

gave on gelatino-chloride silver with normal exposure a clear, vigorous, and well-modelled positive, the film of which was studded with oxygen bubbles.

If we assume that, on exposure of chloride or bromide of silver, a sub-chloride or sub-bromide is formed, the reduction by hydroxyl or sodium peroxide may be expressed by the following equation:—



It is, however, also possible that the sub-haloid is first again oxidised, and that the deposition of the silver takes place in a secondary phase as follows:—



The sodium peroxide,  $\text{Na}_2\text{O}_2$ , stands in the same relation to hydroxyl,  $\text{H}_2\text{O}_2$ , as the phenolate,  $\text{C}_6\text{H}_5\text{ONa}$ , does to hydroquinone,  $\text{C}_6\text{H}_4(\text{OH})_2$ .

In a similar way as one considers hydroquinone as the fundamental

developer, so ought hydroxyl, and not the sodium peroxide, to be considered the developer.

At the beginning of 1898 Andresen had proved that hydroxyl in the presence of hydrochloric acid acted as a reducer. When, in the following summer, MM. Lumière made known the interesting action of ammonium persulphate, he again took up the experiments, and proved that there was a certain similarity between the two compounds as regards the attacking of the densest parts of the image.

Liesegang, in 1898,\* had pointed out that negatives treated with ammonium persulphate could, by immersion in lukewarm water, be converted into a relief image. The formation of this relief also results from the action of acidulated hydroxyl solution without the use of the hot water, as the silver and the gelatine in which it is imbedded is removed. If a silver image—for instance, a very hard negative—is immersed in a solution of—

Hydroxyl (three per cent.)	100 c. c.
Hydrochloric acid (sp. gr. 1.19)	2 „

it will be seen that, especially at a temperature of between 15° and 20° C., the densest portions of the image, after a few minutes, will begin to get loose, and that the silver and the whole of the gelatine surrounding it will dissolve away. If the action is allowed to continue, it extends to the half-tones and then into the shadows. Andresen has not determined whether the silver separates out as such or in an oxidised form, but its colour alters but slightly, if at all.

The reason why the gelatine surrounding the particles of silver loses its coherence easier after treatment with the hydroxyl than that where no silver is might be explained by assuming that the former, by exposure in the camera, &c., has become partially oxidised by the absorption of bromine or chlorine, and for this reason withstands less easily the action of so energetic an oxidising substance like hydroxyl than the gelatine which is left intact during exposure.

The formation of the relief thus produced by hydroxyl ought to be useful for certain photo-mechanical processes.

#### THE RESEARCHES OF EDMOND BECQUEREL ON DIRECT HELIOCHROMY.\*

“It is very remarkable that the impressionable substance of which we speak is sensitive between the same limits of refrangibility as the retina, it is the only one which is shown under these conditions. If the solar spectrum is projected upon a plate prepared as above, the action begins to manifest itself in the yellow and the green, then it takes place on one side towards the red, and on the other towards the violet. The action is stronger where the maximum of light is found. In the red part the substance takes a red tint; in the yellow part, a yellow tint; in the green part, a green shade. The blues are very fine, and the violet tint resembles that of the spectrum.

“If a bundle of luminous red rays is isolated and made to act upon the substance, when it begins to exert its action the colour of the part acted upon turns to red; if the action continues, the tint remains the same; if the experiment is much prolonged, the substance can be completely changed, and there only remains the metallic silver there where the light has fallen.

“If a bundle of blue rays is used, the same effect is produced, the blue tint obtained upon the surface takes more and more strength, and, upon letting the light act during a long time, at the end the tint becomes that of metallic silver. It is still the same for each group of rays, which give, after an action of a certain length, a tint of the same shade as themselves; but it happens finally, if the reaction is nearly complete, that the impressionable substance tends to show metallic silver.

“These effects show that it is not by an action of the kind which gives place to the phenomena of thin layers that the substance reproduces the coloured impression of light, but on account of a special action, which causes the curious substance above named to have the faculty of only diffusing rays of the same refrangibility as those which have acted chemically upon it.

“It is necessary, above all, to give some indications as to its probable composition; although it cannot exactly be told, it is probable that the substance is violet sub-chloride of silver, that is to say, a chloride of silver having an equivalent of chlorine less than that of white chloride.

“By this hypothesis the fact can be cited, that in treating the chloride by the solvents of white chloride, such as ammonia, hyposulphite of soda, &c., the white chloride dissolves and the metallic silver always remains.

\* Concluded from page 294.



"The sub-chloride of silver is the only chemically impressionable substance, which has the remarkable property of reproducing the shades of luminous actine rays. The iodides, bromides, &c., do not give any colour, and, if even the chloride is mixed with a little of these compounds, all shades disappear. The colours are obtained directly by the luminous action, and without the use of any reagent.

"This composition has been tried upon paper, glass, porcelain, collodion, gelatine, &c., but the effect has been more difficult to obtain and less fine than upon metallic plates.

"The influence of the impressionable layer upon the effects obtained is enormous; when the layer is thin, the sensitiveness is great enough. It is much less than the sensitiveness of sheets which are prepared with the iodide of silver than with bromide, to obtain a picture in the dark room, but it is almost as much as the plate iodised in the manner of Daguerre; but, if the sensitiveness of a thin layer is great enough, the effects of colouration are very weak. In using a thicker layer the substance becomes less sensitive and the colours reproduced become clearer; in proportion as the layer thickens, the sensitiveness lessens more and more, but the coloured reproductions are more beautiful.

"There is a certain means of knowing the relative thickness of the layer of sensitive chloride, and which allows it always to be put in the same condition of preparation; it consists in introducing into the voltaic circuit, formed of the battery of the plate and of the bath of hydrochloric acid, an apparatus to decompose water, in order that the electric current which brings the chloride upon the surface of the silver should decompose the water in the second apparatus. The electrochemical decompositions always taking place in definite proportions, it deposits the same quantity of chloride upon the silver plate which it takes from the hydrogen in the apparatus to decompose water; thus, supposing that the electrometer indicates 5, 6, or 7 c. e. of hydrogen, it is certain that there will be as many c. e. of chloride fixed upon the surface of the silver.

"Working in this manner, it can be told at any moment, whilst the sensitive layer is preparing, what is the exact quantity of chloride which is put on the surface of the plate.

"I have discovered that, in order to arrive at a layer of which the thickness should correspond to the *third order of thin plates*, 3 c. e. of chloride per square decimetre are required, the condition then is such that you have sufficiently good reproductions of prismatic coloured images; if it is increased to 6 or 7 c. e. per square decimetre, that is to say, to the thickness which corresponds to thin plates of the fourth order, then you have the best-coloured reproductions; when very good effects are desired, it should stop there. To give an idea of the real thickness of the layer, I should say that, with 4 c. e. of chloride per square decimetre, the layer is nearly  $\frac{1}{1000}$  of a millimetre in thickness.

"When the luminous spectrum is projected upon a surface of silver prepared with 6 to 7 c. e. of chloride per square decimetre, which surface has a shade of almost wood colour, one can see according to the proofs placed before the Society, what are the effects obtained; the part struck by the prismatic red is red, and turns to very dark red towards the least refrangible end; the yellow is hardly visible; the green is well seen, the blue and the violet are superb, and show the same tints as those of the spectrum.

"Altogether the tints, though like those of the luminous actinic spectrum, are a little dark in comparison with the background of the plate, which remains a little clearer.

"But, as will be seen afterwards, the surface can be modified after it is taken from the bath and before its impression by the spectrum, so that the colours obtained are much more beautiful.

"In fact, this substance, which may be called *mineral retina*, can undergo remarkable modifications either from the action of heat or from that of certain parts of light. In raising the temperature of the chloride, but not so high that it becomes fused, towards 150 or 200 degrees, it is found that the tint takes a rosy colour after cooling.

"If the spectrum is made to act upon the substance thus modified, the effects are quite different from what they were before; the limits of action are nearly the same as before, that is to say, are those of the visible spectrum, only the yellow and the green, although pale, show clearly on the background, which remains much darker, and, if the action of the spectrum is carried too far, the final result would be a white trace instead of a grey trace which had been before the heating. If the plates are heated thus above 150°, the physical transformation of the substance which takes place makes most of the tints disappear; but, if it is limited to a slight and prolonged heating, it is not the same; to this effect the sheet is placed in a copper box, which is placed in a stove heated to 30 or 35° at most, and the temperature is prolonged during

four, five, or six days. Then the coloured prismatic impressions are very beautiful, as you will judge. Not only do the different red, yellow, green, blue, and violet tints, placed when the rays from the spectrum of the same colour have acted, appear clearly upon the background, which remains darker, but, again, a bundle of white light acts in giving a white tint to the place upon which it acts.

"The sub-chloride of silver undergoes equally, from the extreme red rays of the solar spectrum, a physical modification as remarkable as by the action of heat, and by another means produces beautifully coloured reproductions of the solar spectrum. To obtain this result, place in a plate-holder, covered with dark red glass (coloured by the protoxide of copper), a prepared plate as it comes from the bath after the action of electricity, and expose the whole to the solar rays. At the end of fifteen to thirty minutes the plate becomes darker than before, and the same effect is produced, which is shown at the least refrangible end of the spectrum. At the same time that this colouring takes place the sensitive substance is modified little by little, and probably in the same manner as under the action of heat. On projecting upon its surface a solar spectrum, it appears at the end of some minutes with all its shades admirably reproduced, and even the yellow and green parts, which before this operation had been dark and slightly indicated, are very clear. The preliminary action of the red rays should not be too prolonged, for the substance becomes less sensitive. These different actions can be judged by the specimens submitted to the Society.

"The coloured impressions once obtained can only be preserved in darkness, but then they can be preserved so indefinitely; if they are exposed to diffused or solar light, they fade little by little and disappear.

"It is very remarkable that it is only in, so to speak, a state of passage that the sensitive substance has the power of reproducing the tints of the actine luminous rays; thus, in leaving the same physical state, that of the unaltered substance and in going towards the extreme limit, which is complete decomposition, the substance shows different physical arrangements, according as it has been struck by such or such a ray.

"It results from what has been said that the coloured impressions that have been shown alter continually, even whilst we look at them; if they are kept in the dark, they do not alter; only, if the substance is not very sensitive, and it is a question of lamp light, the proofs can be left under their influence several days without disappearing.

"The effect that diffused light produces is such that, if a coloured proof is placed under a blue glass, for example, it would take a blue tint and would in time become grey; it would be the same with different coloured glasses, the final state, as to colouration, would seem to be the same whatever the light may be which attacks this substance; it seems, then, that it is only in an intermediate state, and thus, as I have always said, that colourations are shown.

"It is possible to obtain reproductions of coloured images, that is to say, paintings by light, as can be seen by the specimens which I give, of which some are forty years old; but there are reasons which prevent these paintings from being comparatively as clear and having the tints as bright as those of the luminous spectrum. In fact, in the images the compound tints are more or less mixed with white; it is then necessary that the action of the white light should not change the tint of the coloured rays of the predominating tint. To obtain this result, the prepared plates must be first submitted to heat or to the action of red glasses, and then the light ones are obtained clearly, but the yellow and green tints are not clear. If the plates are not heated, the tints appear but the whites are grey. On the other hand, the substance is very slightly sensitive, and it takes several hours, and even several days, to obtain these images. Nevertheless, with precautions these drawbacks may be in part avoided.

"The proofs of the reproduction of coloured images which are here shown are what can be actually obtained by the help of this sensitive substance.

"These last reproductions have hitherto only slightly occupied me to this time, for they have only had for me a purely scientific interest, and I have not thought of applying them, since the impressions only lasted in darkness, and faded little by little in light. All the attempts made up to this time to prevent this fading have not succeeded, and it is only in a transition state that the sensitive substance, the true mineral retina, possesses the remarkable property of preserving the impressions of the actine luminous rays.

"I ought even to add, that the attempts made by some persons who have borrowed my experience, and of which I have been witness, are far from being as clear as those which I show, and which have been obtained by taking all the precautions named above.

"Will a means be found of preserving these images when they remain



exposed to the rays of light? Will the arts be enriched by pictures painted by light? We cannot prove this. I simply make you a witness of my experience in all its details, to introduce to you a unique substance of its kind, which allows you to paint with light, and to render you able to reproduce easily the effects which I have obtained."

PHILIP E. B. JOURDAIN.

## FOREIGN NEWS AND NOTES.

**Combined Development and Fixation.**—In the *Photographische Mittheilungen* P. Hanneke gives an account of a process he has devised for this purpose. Starting with Punnett's idea, that hyposulphite of soda may be added to an ortol developer, which in his hands was successful for chloro-bromide transparencies, Hanneke has endeavoured to apply a similar method to bromide plates, for which purpose Punnett's process was unsuitable. After unsuccessful experiments with a large number of developers, pyrocatechin was tried and gave surprising results. For combined development and fixation, it is necessary that the developer shall act with rapidity and without producing fog, as it must take effect before the hyposulphite of soda attacks the image. The caustic alkalies favoured rapidity, but, in most developers, had to be used in such quantity that the film suffered if sufficient hypo to fix the plate were added. E. Vogel recently pointed out that, with a rapid pyrocatechin developer, an excess of caustic alkali is unnecessary. Hanneke has followed these lines, and recommends the following formula for preparation of a concentrated solution, to be afterwards diluted for use:—

Pyrocatechin .....	7 grammes.
Caustic potash (stick) .....	7 "
Hypsulphite of soda .....	30 "
Water .....	75 c. c.

According to Hanneke, the results are excellent, and he states that hyposulphite may be added *ad lib.* Modifications should be made in the proportions of the ingredients to suit the characteristics of different plates. For development of Sachs or Lumière plates he recommends:—

Stock solution, as above .....	8 c. c.
Twenty per cent. solution of hypo .....	15 "
Water .....	20 "

The developer may be used a second time without great loss of rapidity.

**Reduction with Ammonium Persulphate.**—The *Photographische Mittheilungen* draws attention to the fact that negatives thus reduced often exhibit red fog after exposure to light. This is due to the silver remaining in the film after reduction. The negatives, after reduction, should be rinsed, returned to the hypo bath for a few minutes, and then washed.

**Blue Tones upon Collodion Paper.**—H. Henrice writes in the *Photographische Chronik* that he has been experimenting for a long time in this direction. He declares it impossible to obtain blue tones with the combined bath. The results of some twenty or thirty modifications of the formula were always brown or violet, but never pure blue. He has obtained blue tones by separate baths, but has not been able to prepare a toning bath that will continue in the same condition long. It appears that the bath should be quite neutral, and that, as soon as half-alkaline or half-acid combinations of gold are formed, the tone changes to violet. Pure blue tones are best secured with the cyanide bath. The prints should be well washed before toning, and, with some papers, washing and slight fixing for three to five minutes is preferable. In the latter case the prints should be washed for a short time after fixing, but traces of hypo assist toning with certain brands of paper. The prints should not be too strong. They tone through stages of brown to blue, and in the case of landscapes some very effective combinations of brown foreground and blue distance can be obtained. The bath should contain little sulphocyanide and much gold. It should be prepared fresh each time, and used whilst still yellowish. Blue tones can only be obtained within ten minutes, or, in the case of very strong baths, within twenty to thirty minutes from the time of mixing. The solution afterwards becomes cloudy and yields only the usual violet

tones. Alkaline baths also yield a blue tone, but with less certainty and they are even less stable. If the prints are washed and fixed in a ten per cent. hypo bath for about three minutes, and then passed for ten minutes through three changes of water, they acquire very plucky, deep blue tones in the sulphocyanide bath, but the colour is less pure than after simple washing. Paper of the anchor brand should be toned with  $\frac{1}{2}$  gramme sulphocyanide, 100 parts water, and 2 c. c. of a one per cent. gold solution per 15 square centimetres of paper. To obtain the best results, the prints should be toned separately, each with fresh solution. It is useless to add more gold to an old bath, as the same results are not obtainable.

**The Keeping Qualities of Dry Plates.**—M. L. Hervé showed some lantern slides at a meeting of the Société Française which had been made with bromide plates fifteen years old. The fact acquires additional interest, inasmuch as M. Hervé had made the plates and had kept a record of the preparation of the emulsion. The formula was a modification of that published by M. Braun in March 1882, and may be described briefly as follows: Precipitation of silver bromide in presence of a very small quantity of gelatine, sufficient to form an emulsion; ripening the emulsion with ammonia; addition of water; decantation after standing a few days; final addition of pure gelatine. The process obviates wasting the emulsion. M. Hervé used less ammonia than specified by M. Braun, as he wished to make a slow emulsion, and had found the plates fog when prepared by the original formula. He also worked at a lower temperature. Some other slides were shown which were upon plates made in the same year, but without ammonia. The emulsion had been kept in very hot water for forty-five minutes, then boiled for fifteen to twenty minutes, and allowed to stand a week before decantation. These plates were still fairly good. The plates had been packed face to face, separated by sheets of tissue paper.

## SIMULTANEOUS DEVELOPMENT AND FIXATION.

DR. LUDWIG ELLON, of Charlottenburg, before describing his own process for this purpose, points out that the various attempts in this direction have in some special cases led to interesting results, but not as yet to a really generally applicable practical process.

Of recent labours in this direction he mentions those of Punnett, who, on p. 126 of THE BRITISH JOURNAL OF PHOTOGRAPHY for 1898, describes the obtaining of a fixed image with some kinds of diapositive or lantern plates (gelatine plates, containing chloride and bromide of silver) by the application of a strongly caustic alkaline ortol developer in the presence of a fixing salt.

But, with the best diapositive plates in the market, and strictly following Punnett's directions, he obtained an image of only very small intensity; and the bromide of silver-gelatine dry plates used for producing negatives, and therefore much more important, gave no image at all when used according to Punnett's process.

W. B. Bolton describes, on p. 804 of THE BRITISH JOURNAL OF PHOTOGRAPHY for 1898, and on pp. 20 and 52 of the same JOURNAL for 1899, a developing, strengthening, and fixing in one operation (not, however, for simplifying the process, but for obtaining perfect negatives), but he denies from his own experiments the possibility of applying successfully the process to bromide of silver dry plates.

It is also known that hyposulphite of soda easily dissolves bromide of silver exposed to light, and none of the heretofore-used developer solutions, including the so-called rapid developers, have been able to surpass in effect the said hyposulphite, or to yield a useful image by the presence of hyposulphite in excess. The pyrocatechin, in the form heretofore used, forms no exception in this application.

It is further known that slowly acting alkaline developers can be to some extent rendered into rapid developers by substituting caustic alkalies for the carbonates; but, while, for instance, with the isomeric hydroquinone three to four parts of hydrate of potash are required for one part of hydroquinone, in order to produce a rapid developer (which, owing to its strongly alkaline character, has only a limited application), pyrocatechin, on the other hand (and this is new), with the amount of alkali hydrate required for forming the di-alkali salt, or, with a still smaller amount of alkali hydrate, forms an extremely rapid developer. It is, in a concentrated form, composed as follows:—

I.	
Pyrocatechin .....	7 grammes.
Hydrate of potash .....	6 "
Crystallised sulphite of soda .....	30 "
Water .....	75 "

\* Photographische Correspondenz (1898), p. 561.



The application of the pyrocatechin alkali developer, also in combination with fixing salt (hyposulphite), gave at once a splendid result. For a dry plate 18 by 18 m. m. is used:

## II.

Concentrated developer I .....	10 c. c.
Soda fixing solution 1 to 5 .....	20 "
Water.....	20 "

Without prolonging the time of exposure beyond the usual, one obtains, by instantaneous or by time exposure in the course of three to five minutes (all according to the kind of plate used), a perfect, well-graduated, nicely covered, and perfectly fixed negative.

An unexpected advantage of the process shows itself here at once, in that the whole process is completed in a fraction of the time heretofore considered necessary for a successful process.

The used developer may be used for a second and third plate.

The fixing developer equalises various degrees of exposure, so that even a much over-exposed plate, when treated with a freshly formed developer, yields a negative that can be copied. Like the ordinary developer, it may easily adapt itself to various cases by dilution, by applying used developer, or by suitable additions, such, for instance, as bromide of potash and the like. The fixing developer may thus also be successfully used for films, bromide of silver paper, or lantern plates. Very remarkable results are obtained with the latter while using a developer composed, for instance, as follows:—

## III.

Concentrated developer I .....	5 c. c.
Soda-fixing solution 1 to 5 .....	40 "
Water.....	10 "

A perfectly clear and good image is thus obtained in the shortest possible time.

Instead of the hydrate of potash, I may, with quite similar success, employ hydrate of soda, or of lithium, or a mixture of two or three of these bases, and I may also let other subsulphurous alkali salts partly or wholly take the place of the subsulphurous soda (hyposulphite).

The aforesaid relative amount of alkali in the developer is only chosen as an example; it may be varied, within rather wide limits, without rendering the success of the process quite doubtful.

The technical value of the described new process would thus not only depend upon that it at once solves the old problem by the developing to obtain enduring photographic images in a surprisingly simple and yet complete manner, thus effecting a material saving to the amateur and the professional photographer in time, labour, and tools, but also on the circumstance that it gives results so distinctly good as not to be attained so easily and certainly by the heretofore usual process.

## A NEW PHOTOGRAPHIC PRINTING PROCESS IN A NEW PERMANENT COLOUR.

[Communication to the Edinburgh Photographic Society.]

THE new printing process which Mr. Hargreaves brought before the Society was one by means of which he was enabled to produce prints of a deep purple, and a light red colour on a cotton or linen fabric. After explaining that he appeared as a chemist only, and after discussing the dyes used by the ancients, referring specially to the Phœnician or Tyrian purple, Mr. Hargreaves continued as follows, viz.:—

"In fixing colours upon any desired surface, such, for instance, as paper or cotton cloth, there are two distinct methods, which, in order to thoroughly understand, especially in the case of the cotton cloth, it is necessary to inquire into the physical characteristics of the cotton filaments which go to make up what is popularly known as a cotton thread. These extremely fine filaments are really tubular, but they have the peculiar characteristic of being flattened or collapsed. It was by this peculiar property that it has been definitely proved that the cloth which surrounds the ancient Egyptian mummies was linen and not cotton. These wrappings, it may be observed, are the only specimens we have of the productions of the looms amongst the nations of antiquity, and, although it was doubted for a long time as to the actual fibre, the microscope has definitely shown that they are not cotton but linen, and this has been effected by the flattened condition which cotton filaments always possess. The walls of these fibres, which are really tubes, are exceedingly fine, porous, and more or less netted and transparent.

"Now, colouring matters are of two kinds, the soluble and the insoluble. The former are those which are in a perfect state of fluidity, or in solution; the latter are lakes or pigments. When a fluid colouring matter is applied to a cellulose fibre, it is very easy to understand that it passes easily through the netted or porous walls of the cellulose tube; but, of course, it passes outwards with the same facility, and such colours are generally not fast, that is, they easily wash out.

"On the other hand, a pigment or lake, owing to its particles not being sufficiently fine, cannot penetrate within the tube, and so are merely plastered on the outside, and will not remain unless some adhesive matter is also applied, and, even in this case, cannot be regarded as being any better than a paint.

"The truly beautiful and permanent effect of the colouration of textile fabrics can only be produced by so arranging the colour that, say, one of its constituents dissolved in some volatile solvent is applied to the fibre, and, on drying, the chemical becomes insoluble, and is practically locked within the tube, in which condition it is usually spoken of as a mordant. The cloth is then immersed in a solution containing the other constituent. The latter enters within the tube, combines with the other constituent already present, and forms a coloured lake or pigment, which is imprisoned within the tube. This is the true principle of dyeing. The effects produced are always superior in depth and beauty of tone to mere plaster, and this brings me to the specimens which I have the honour to bring before your notice.

"Being engaged recently in some investigations relating to the flashes of various explosives (a few specimens of which I have here to-night, taken by Mr. M'Kean), I turned my attention to the printing of negatives, and, having some acquaintance with the dyeing and printing of textile fabrics, I endeavoured to see whether it were possible to obtain a photographic print on bleached cotton cloth, a condition being that the colouring matter should enter the cotton filament and thus secure absolute fixity. This, I venture to think, I have done. The colour which I have succeeded in fixing in this way is a beautiful purple. It cannot be washed out of the cloth by any ordinary method of, say, a boiling soap solution, and, what you will probably regard as more important, it is, in my opinion, quite permanent so far as the action of light is concerned. It is, in the daytime, a very beautiful colour, and the effects on the cloth are exceedingly soft and easy for the eye to rest upon; and, lastly, the process is one of extreme simplicity and cheapness. Practically any number of prints can be developed together, tumbled about in any fashion without any care being exercised, and, when the patent specification is published, as it will be in a few months, I venture to think that you will appreciate its extreme simplicity."

Mr. Hargreaves then showed a number of specimens, and tested the fastness of one successfully by boiling it in a soap solution.

ANDREW F. HARGREAVES, F.C.S.

## PRACTICAL NOTES ON SOME IRON PRINTING PROCESSES.

### PART II.—FERRO-PRUSSATE, &c. (continued).

*Printing.*—A fairly strong plucky negative gives the brightest results. Printing should be in a strong light and may be in direct sunshine. If the paper is old, something akin to reversal shows in printing. Printing goes on until we have greenish high lights on a pale lilac ground.

*A drawing, diagram, &c.,* consisting of black lines on white paper, may be used in place of a negative. The resulting print shows, of course, as white lines on blue ground. Where reversal of the picture (right to left) is of no consequence the sharpest results are obtained by putting the face of the engraving in contact with the sensitised surface and printing through the back of the engraving in direct sunlight.

Name of diagram, &c., may be written in red if ordinary red ink is acidulated with oxalic acid. The acid removes the blue colour, and the red ink remains. One part of acid in twenty of ink will be found generally satisfactory.

*Development* essentially consists in washing (dissolving) the unaltered parts of the sensitising mixture. The washing water should be as free from lime or chalk as possible. If lime is present to any great extent, carbonate of iron may be formed and the lights stained.

Prolonged washing in running water, or in frequent changes, helps to clear the whites.

*To brighten the colour of the prints, a trace of acid, e.g., citric, hydrochloric, &c.,* may be added to the washing water.

*Over-exposure* can be partly counteracted by bathing the print in a very dilute solution of ammonia, e.g., begin with ten drops of strong ammonia in a pint of water, and add a few drops at a time until the print is lightened sufficiently.

Again, a dilute solution of oxalic acid (say, five per cent.) has a similar action.

*Under-exposure* may, to some extent, be compensated for by developing the prints in a dilute solution of iron perchloride. The proportions of perchloride recommended vary from 1 in 300 to 1 in 120 of water; but 1 part iron to 200 parts water will be found a generally useful strength. Iron protosulphate or iron nitrate may be used in place of the perchloride, with similar results, but the last-named seems the favourite.

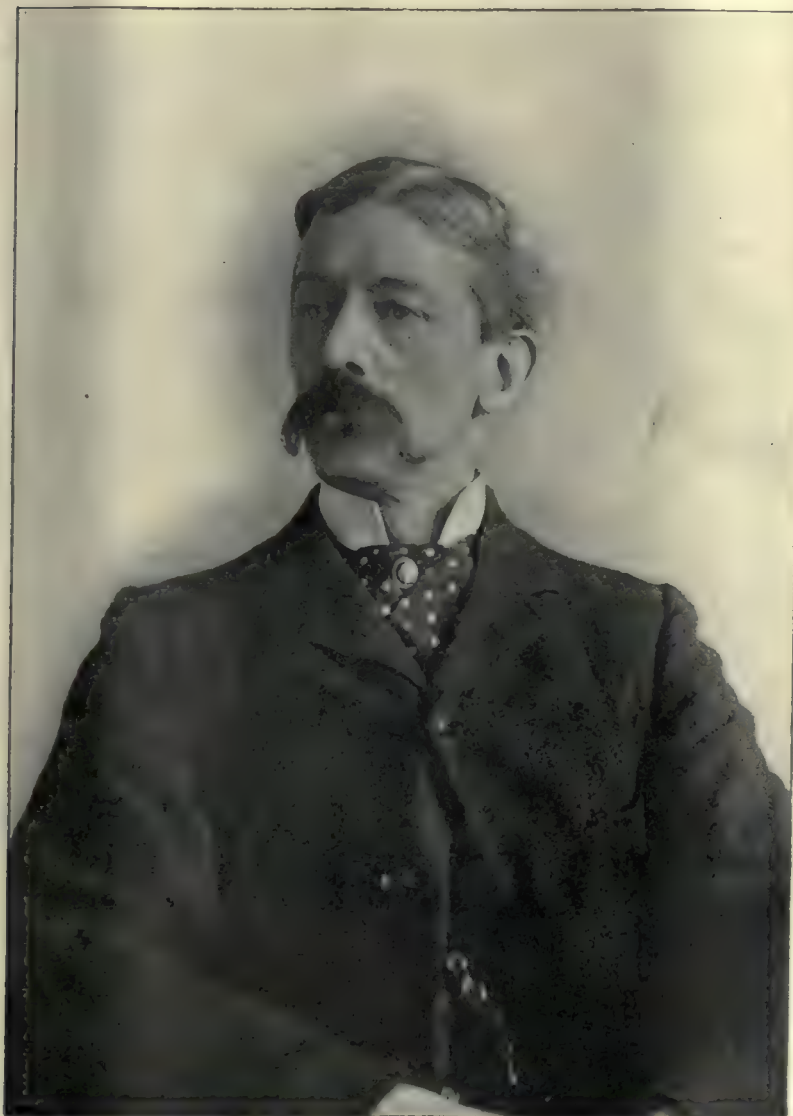
*Reduction of an Over-printed Proof.*—Immerse the print in a five per cent. solution of caustic potash until the image turns pale yellow. Wash well, and transfer to water containing a little hydrochloric acid (ten drops per ounce). The print again becomes blue, but is reduced in strength generally.

*Intensification.*—This may be done by immersing the print in a five per cent. solution of potassium sulphocyanide.

*Toning Blue Prints.*—Many experiments have been made with a view to altering the colour of a blue print. In certain directions considerable success has resulted.

*Brown-black.*—The print, having been previously well washed and dried, is immersed in dilute ammonia (5 in 100), until the image is





W. B. BOLTON.

DIED MAY 12, 1899, AGED 51.







almost invisible. Again washed and transferred to a bath of tannic acid (5 in 100), washed and dried.

*Another Method.*—Immerse the print first in dilute caustic potash (8 in 100), rinse, and transfer to tannic acid bath (5 in 100), or, in place of caustic potash, we may use potassium carbonate solution (5 in 100).

*Another Method.*—Make a saturated solution of soda carbonate; dilute this with its own bulk of water; to this add as much tannic acid as the solution will dissolve. Into this mixture plunge the prints until they attain the desired darkness; wash and dry.

*Brown-black Tones: Another Method.*—Bleach the blue print in a cold saturated solution of borax; wash well, and transfer to a saturated solution of tannic or gallic acid; wash again, and give a final bath of acetic acid (3 in 100).

*Another Method.*—Make a ten per cent. solution of potassium sulphocyanide; to this add a small quantity of lead acetate. The prints are immersed in this, dried without washing, and exposed to daylight. This ought to yield a fine black.

*Another.*—Immerse the prints in a five per cent. solution of potassium carbonate. Wash, and transfer to bath composed of 1 part acid pyrogallie, 12 parts gallic acid, water 1500 parts. If the pyrogallie acid is omitted, the colour tends to violet rather than black.

*Brown-black.*—First bath the print in dilute nitric acid (1 in 80). Transfer to bath of dilute ammonia (1 in 25), until the print becomes faint and reddish-yellow; then transfer to a 1 in 20 bath of tannin, or extract of catechu.

Float the print on a bath of nitrate of silver (1 in 60). When the image becomes almost invisible, remove and wash well. The print may now be developed with the ordinary ferrous-oxalate mixture. Transfer to dilute hydrochloric acid (1 in 200), wash and dry. This process will yield black prints.

For red-black tones reverse the alkali-tannic procedure thus: Soak the print for five to ten minutes in a bath of tannin (1 in 25); then transfer to a bath of soda carbonate of similar strength (1 in 25).

*Brown-black Tones.*—Immerse the print in a 1 in 25 solution of caustic potash until orange grey; wash and transfer to 1 in 20 gallic acid, and rinse in dilute hydrochloric acid, 1 in 50. Now float on a 1 in 50 bath of nitrate of silver; wash well, and transfer to old (used) hydroquinone developer. If, after the nitrate of silver bath and subsequent washing, the prints are exposed for a short time to strong daylight, the results are better still.

*Blue-black.*—Print strongly till shadows bronzed; dip in water, then in three per cent. solution of ammonia until pale violet; then immerse in a six or eight per cent. solution iron proto-sulphate.

*Deep Blue Tones.*—Of saturated solution of ferrous sulphate take 8 parts, add 8 parts water, and then 1 part sulphuric acid.

*Sepia Tones.*—Bath the print in caustic potash, 1 in 20, until the image is of an orange tinge; then transfer to tannin bath (say 5 grains per ounce of water); then another dip in the caustic potash; then wash and dry.

*Lilac Tones* may be obtained by immersing the prints in a hot solution of lead acetate. Lilac tones also are obtainable by very dilute solutions of borax or potassium oxalate. If these lilac prints are dipped in dilute potassium sulphocyanide and exposed to light (without washing), they assume a slight pinkish tinge.

*Green Tones.*—To 100 parts water add 5 parts sulphuric acid; immerse the prints until the desired tint is obtained; wash slightly, and dry. Again: Prepare a thirty or thirty-five per cent. solution of potassium sulphocyanide. This bath gives tones ranging from moss-green to brown-black.

*Varnishing.*—Blue prints may be varnished by applying with a brush a solution of Canada balsam in turpentine, and drying in a strong draught. Dammar varnish may also be used.

*Corrections* may be made, i.e., portions of the blue part removed, by applying, with a quill pen or small brush, a strong solution of oxalic acid; or a strong solution of washing soda may be used. Care must be taken to see that the action does not spread.

*Contraction of the Print.*—Where this process is used for reproducing plans, &c., it is important to notice that, with certain papers, there is a general shrinkage or contraction in the paper. Therefore the scale should always be included in the print, if measurements are to be made from the reproduction. The contraction may be as much as one per cent. of the linear dimensions.

*To Convert a Blue Print into a Line Drawing.*—Having previously well washed and dried the print, trace the outline, &c., with good Indian ink, rather thick, and let it dry thoroughly. Then dip the print for a few moments in a five per cent. solution of oxalic acid, or potassium oxalate, or ten per cent. washing soda, until the blue colour is removed, leaving only the black lines. In place of Indian ink, waterproof ink may be employed.

*Retouching Blue Prints.*—Make a saturated solution of iron proto-sulphate, and add to it a ten per cent. solution of potassium ferricyanide; collect and wash the precipitate. Mix with a little gum water and apply with small brush.

*Sundry Notes.*—(a) Ammonia citrate of iron is also known as ammonio-ferric citrate, and as citrate of iron and ammonia.

(b.) Potassium ferricyanide is sometimes spelled ferridcyanide; also known as red prussiate of potash.

(c.) If blue fog occurs when using the green form of ammonio-citrate of iron, it is an indication that the sensitising mixture contains too much potassium ferricyanide.

(d.) If the light is not sufficiently strong to admit of the print being fully printed in the time available, it may be developed (when only partially printed) by immersing in the following. In two gallons (sixteen pints) of water dissolve one ounce of chloride of iron and a like quantity of nitrate of iron.

(e.) Several authorities advise a strongly sized paper and recommend—

Arrowroot .....	4 parts.
Glucose .....	1 part.
Water .....	200 parts.

Dissolve by heat. Skim and strain through muslin and apply hot with a soft clean sponge.

REV. F. C. LAMBERT.

## FLASH POWDERS.

[American Journal of Photography.]

THE sun is not the only source of radiation which produces chemical effect. Any substance which, when heated intensely, resists all tendency to conversion into vapour or gas—that is, remaining still in a solid condition—will give a continuous spectrum, analogous to that of the sun. It will emit the so-called actinic rays.

There are several bodies which resist the vapourising power of the intensest heat we are able to produce on earth, though they do yield to the solar heat. Such bodies give a continuous spectrum from the red to the violet. The carbon points of the electric light arc yield a pure white light with the uninterrupted spectrum, and such as is capable of producing chemical action and may be employed in photography. Incandescent lime, magnesia, zirconia, and other substances likewise give forth the chemical light. It is for this reason that the Welsbach light may also be employed photographically, the mantle being composed of these incandescent earths. Magnesium metal is especially rich in the blue rays of the spectrum, and, though the light it produces when ignited is not so intense as the electric light, it is still capable of producing in an equal degree photographic action.

There is chemical action in all the rays of the spectrum, but the blue have the preponderance.

The light from magnesium is a beautiful soft light and would form the ideal light for illuminating purposes, but the rapidity of combustion precludes its use, even if it could be made cheap. But for photography nothing is equal to it except, perhaps, aluminium. Magnesium, when supplied with oxygen, is converted into magnesium oxide—or magnesia, as it is generally called. The burning in air or in oxygen gas is attended with intense heat, which causes the particles of solid magnesia to grow incandescent. Bunsen estimated the light of incandescent magnesia to be in intensity only  $\frac{1}{100}$  of that of the light of the sun, while its actinic or chemical energy is  $\frac{1}{10}$  of the sun's—that is, the sun's light is 500 times stronger than burning magnesium, but only 86 times stronger in actinism. To get the whole benefit from the burning metallic magnesium, it will be seen that anything which increases the intensity of the heat will increase the actinic light. The ribbon or wire burns comparatively slow when ignited in the ordinary air, because the supply of oxygen is diluted, but how it glows when burned in a jar of pure oxygen! Hence bodies which quickly and readily supply it with oxygen during its combustion increase its energy. When the mechanical means were improved for converting the metallic magnesium into a fine powder, it occurred to many to mix it with some oxygen-yielding chemical and so increase its power. Pure magnesium, without any substance mixed with it, will give photographic effect, but a great deal of its usefulness is lost thereby, though in many cases its power is sufficient, especially when instantaneousness is not desired.

The danger attending the compounding of other chemicals with magnesium has led many to employ it alone, and lamps are in the market for giving a continuous flow of powder to the flame. But there is a risk of recording movements in the photograph—and to get snapshots by its use alone is out of the question.

Messrs. Gædicke and Miethe, of Germany, some years ago patented the use of magnesium compounds for photography, but no one seems to have introduced their powder to the market, neither in England nor America, or, as far as I can discover, even in their own country. Their claims, however, were published in both the English and German photographic journals, and it is surprising to me that no one ever recommended the mixture for efficacy. The peculiar feature which made their powder different from others was the introduction of amorphous phosphorus in connexion with powdered magnesium. Amongst the many formulae published, I have not been able to find any mention of the use of this chemical other than in the brief specification published with their patent. They mention, it is true, amorphous phosphorus combined with magnesium and chlorate of potassa, but I am sure they were well aware of the danger of employing such a violent explosive, which mere friction of stirring with a feather will cause detonation.

Although chlorate of potassa cannot be used, the nitrates of some of the earths, such as baryta or strontia, may be safely employed in com-



bination with magnesium and amorphous phosphorus. The barium and strontium nitrates are preferable to the alkaline nitrates, as they are less liable to absorb moisture from the air; but even they should be thoroughly dried before mixture, and so should the amorphous phosphorus.

Take 4 ounces of nitrate strontium (dried) and mix it thoroughly with 1 ounce of metallic magnesium in fine powder; this may be done by sieving through a rather fine sieve, which will serve the further purpose of separating any large grains of magnesium, which cause a miniature sky rocket if left in the powder and make a streak across the plate. Instead of using all strontium, one-third barium oxide may be substituted.

To the mixture of baryta, strontia, and magnesium, add from 50 to 100 grains of amorphous phosphorus. Increase of amount of phosphorus will increase rapidly of the powder, so that, if a very rapid powder is desired, 120 grains may be used.

The amorphous phosphorus should be added last by way of caution, but I think there is little danger to be feared in the mixing. The powder formed will stand considerable friction, and probably is no more liable to explode spontaneously than gunpowder, but even with gunpowder it is well to take care and not presume.

However, let me say here *no compound flash powder should ever be compressed and ignited in a lamp intended to burn only pure magnesium.* Though comparatively safe when ignited unconfined, it becomes a blasting powder, like gunpowder, when rammed or compressed.

Amorphous phosphorus is sometimes called red phosphorus. It is a modified form of common phosphorus, but entirely unlike it in many respects. It is not poisonous, does not ignite until heated to over 500° F., and is not luminous in the dark. The drying of the amorphous phosphorus should not be done over a naked flame, and care should be taken to sieve it first through a fine sieve before mixing with the other ingredients.

It will be seen that the use of flash powder is much more economical than the use of pure metallic magnesium, inasmuch as one has five times as much powder for a little extra expense, and then the same quantity of flash powder as magnesium will do more than threefold the work of magnesium.

A slower form of flash powder may be made by omitting the amorphous phosphorus and mixing 5 parts of peroxide barium (dried) with 1 part of magnesium. Portraits may be made with such a mixture, and I would estimate its rapidity at about one second, while that of the amorphous mixture is probably less than one-tenth of a second. This compound may be made as rapid as the above mixtures of baryta and strontium by adding the amorphous phosphorus. It has the advantage of producing less smoke, and is entirely free of the unpleasant odour which attends the above mixtures.

Recently I read of a compound which is said to give good light with very little smoke—an objection to most powders. It may be prepared, according to Prof. Alex. Lainer (*Phot. Correspondenz*), by mixing equal parts of magnesium powder and of ammonium nitrate. The ammonium nitrate being somewhat hygroscopic, it is necessary to fuse the salt before its use, and to keep it pulverised in a well-stoppered bottle. The powders should be perfectly dry and finely powdered, and then mixed with a feather on a sheet of paper. As to the quantity of the required flashlight powder, the author states that he has obtained perfect negatives, with plenty of detail in the shadows, by using a mixture consisting of 0.3 gramme (about 5 grains) of magnesium powder and 0.3 gramme of ammonium nitrate, the lens being stopped down to f-7, and the distance of subject from the lens amounting to about 6 feet. The volume of smoke given off was so small that five subsequent exposures could be made in the room without the least disturbance to the occupants. In taking a photograph of a room of 15 by 15 feet, the author obtained a sufficiently detailed negative by using a mixture of 1 gramme of magnesium powder with 0.8 gramme of ammonium nitrate. The rate of combustion with this new flashlight mixture is, perhaps, not quite as rapid as with the above mixtures, but, nevertheless, it is sufficiently quick to enable the operator to photograph by means of it portraits and groups, provided that the constituents of the mixture are perfectly dry and finely powdered, and that the mixture is spread over a thin film of gun-cotton, which may be ignited by means of a taper fastened on a long rod.

I have not tried this smokeless powder, but would here caution any one not to try to increase its rapidity by addition of amorphous phosphorus unless they make the experiment at first with very minute quantities. I am inclined to think that even the mixture of ammonium nitrate and magnesium should be made with care.

A word about the use of aluminium in flash powders. It might seem astonishing that so slightly oxidisable a metal as aluminium should be made to burn with a very brilliant light. True, in the shape of wire or ribbon it will not burn when placed in the flame of a gas jet, but when the heat is intense it burns with a beautiful light and affords an energy equal to magnesium. It has one advantage over magnesium. Very finely powdered magnesium soon tarnishes and becomes almost useless, so that, when the other ingredients of the flash powder are such as attract moisture, it is necessary to keep the powder closely protected from damp atmosphere. Fine aluminium powder will keep for years at ordinary temperature without oxidising, but aluminium powder must be exceedingly finely ground to be of any use photographically. Coarse-

ground magnesium will ignite without difficulty, but aluminium must be in the form of what is called silver bronze before it will burn with the flame of alcohol or gas.

I have found that about twenty-five per cent.—that is, one-fourth—aluminium with magnesium, the other components remaining the same, will give an excellent flash powder.

GEORGE RAU.

## SOME ADVANTAGES IN THE USE OF FILMS.

[Communication to the Edinburgh Photographic Society.]

DOUBTLESS the bulk, if not all, of the members present are more in favour of plates than of films. Anticipating this, I have thought, as a counter-blast, to indicate a few of the good points of films, and, if possible, to modify the adverse views regarding them.

Films are much more portable than plates. Space for space, you can get five packets of films in the space of one packet of plates, while one packet of films weighs one-sixth part of a packet of plates. I use the word packet, because these data are taken by comparing packets. If the bare plates and films were taken, the comparison would be still more in favour of the films.

I need not enlarge to any extent on this advantage. The tourist or traveller, be he a hill-climber, cyclist, or pedestrian, asks for something light and portable. He gets it in films as against plates.

Films are non-breakable. We all know what it is to have a pet glass negative broken. How many questions arise regarding how to print a broken negative, how to float a film from a cracked plate, and so on. The photographic question-box would be void of such queries, and the time of societies thus saved, if films were used instead of plates.

Risk of transmission by post or rail would not concern the photographer if he used films. It is not the first time that it has been the duty of the law courts to decide as to the liability attendant on the breaking of a glass negative. Tourist friends abroad can, with every safety, and with minimum cost, transmit exposed films to their folks at home for development; whilst, if the exposures had been made on plates, there would be great risk and expense in transmitting them.

With the ever-increasing number of amateur photographers, the foregoing claims of films have, doubtless, induced many of them to join the ranks.

Now as regards the efficiency of films. There have been, and still are, defects to contend with. These defects, I venture to say, are mechanical, and in a very short time will be quite overcome. The quality of the emulsion is equal to the best; the defect all lies in the support. Strange and apparently unaccountable markings on film negatives have been carefully looked into by the makers, and I am convinced they will soon be blemishes of the past.

Consider the storing of film negatives as against plates, and the small space occupied by a book containing a hundred films as compared with two bulky boxes to hold a hundred plates. Film negatives are also practically, if not entirely, free from halation, and cloud effects are easily obtained on the same film as the subject proper. Plate negatives, even when backed—and backing plates is a troublesome operation—are not void of this evil.

Carbon workers need not make reversed negatives; all that they require to do is to photograph on thin film, when prints may be taken from either side.

As a further argument, a prize picture in our own Exhibition of a year ago was taken on a roll film.

Roll-film photography is a distinct advance in the art. I cite the cinematograph and its results as my reason for this statement. Where would the cinematograph have been without the roll film? We would still be climbing up the hill "Difficulty" with a burden of plates on our back.

Mr. Chairman, we are told "the proof of the pudding is the tasting of it;" the proof that film photography is holding its own and making rapid strides to the front is shown by the following specimens.

Mr. Baird then exhibited a number of quarter-plate, 5 × 4, and 7 × 5 film negatives, and showed several enlargements from these.

A. H. BAIRD, F.R.P.S.

## FLASHLIGHT PHOTOGRAPHY.

At the Photographic Club Mr. Reinhold Thiele attended as promised to take a group of the members with the Weiss flashlight apparatus described last week. On this occasion he had with him a specially designed automatic smoke trap wherewith to prevent the smoke arising from the combustion of the flash powder from pervading the premises. The flashlight apparatus was supported upon a brass standard and was adjustable to various heights by a telescopic movement and damping screws. The actual smoke trap partook somewhat of the form of a balloon, and was made of some fireproof material. It was suspended by an arm over the lamp, and when ready for action its sides are gathered up together with a weighted hoop attached to the lower end, and hitched over two levers. These levers in turn are connected by a cord to a silk thread, which passes across the path of the igniting match which fires the



powder, the object being, when the flash has been made, for the silk to be burnt, so releasing the levers which, dropping, allow the weighted skirts of the bag or balloon to drop and enclose the smoke. The lower end of the bag is closed by drawing a string, the bag lifted off the standard by means of a bayonet joint, taken to a window and the smoke discharged. Mr. Thiele made an exposure, promising to send the result on another occasion.

Mr. Luboschcz showed some photographs resulting from his experiments in flashlight photography, the exposures being practically instantaneous. The absolute sharpness of every detail was in his opinion almost unpleasant, and he thought that if the exposure had been slightly prolonged, giving the effect of a time exposure, the results would have shown a more pleasing diffusion. His examples included some work by flashlight done in the United States of America upon the stage, and others showed the effect of lighting the sitter from several different points. Several of the pictures measured  $22 \times 18$ , and were taken direct. Mr. Luboschcz believed Mr. Falk had done a little in the direction of stage photography by the usual stage lights, but generally supplemented with arc lamps. Referring to some remarks about diffusion of focus, he said that he had seen this effected by holding the flame of a spirit lamp in the path of the rays immediately in front of the lens. Mr. Luboschcz afterwards gave his views upon the subject of development, advocating the use of diluted solutions until by the appearance of the image one could be guided as to what was really the condition of the exposed plate. For the avoidance of halation in a plate which would otherwise show it, nothing was better, he held, than development with plenty of water.

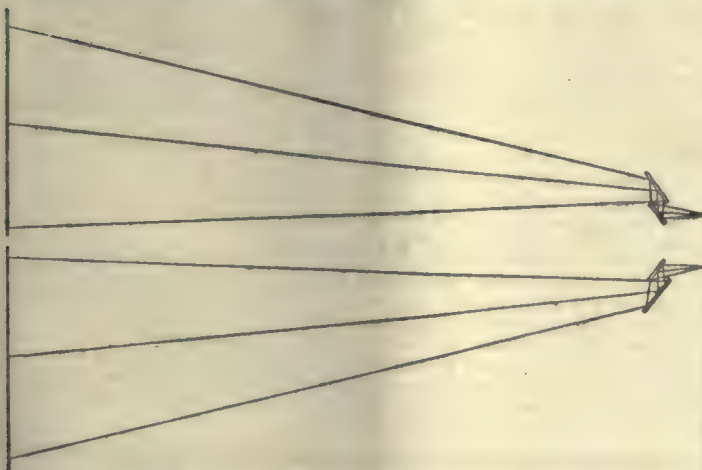
The Chairman dealt in a few sentences with the merits of rodonal for under-exposed plates. One or two minims of rodonal to the ounce made a developer in which the plate could be left for some hours unattended until every detail possible was brought out. A strong solution used for a quarter of an hour then sufficed to yield the best result that could be got from an under-exposed plate.

#### VIEWING LARGE STEREOSCOPIC PHOTOGRAPHS.

[Photographic Times.]

RECENTLY, in making some experiments in optics, it was found desirable to view very large pictures stereoscopically, even stereopticon slides projected, and the writer set about its accomplishment. Apparently there are but two simple conditions involved, i.e., (1) that two pictures (the size is of no moment) shall be made from different positions, say, three inches apart, and (2) that this stereoscopic pair shall be so viewed that the right eye shall see only the right picture and the left eye only the left picture.

Working upon this simple hypothesis, two  $22 \times 24$  negatives were made and prints made and mounted in the usual manner. To make them appear in stereoscopic relief, they were viewed through a binocular eyepiece containing four total reflecting prisms so located that the right



picture was seen by the right eye through the two prisms in front of the right eye, and the left picture by the left eye through the two prisms in front of the left eye. An adjusting screw was provided, which permitted the exact superposition, at varying distances, of the mental impressions of the retinal images of the two pictures. In the construction of other eyepieces magnifying lenses were added, giving a stereoscopic picture of great size, beauty, and atmospheric effect.

Pieces of mirror may be substituted for the more expensive prisms, and even two pieces may be used, each set at  $45^\circ$  to the line of vision, if the pictures are placed some distance apart, with their surfaces parallel, and viewed from a middle point.

The eyes are much more independent of each other in action than is

generally supposed. To demonstrate: If one looks at a single object through this instrument, properly adjusted, the object appears natural. Now, by turning the adjusting screw slightly, two images appear, only for a moment, however, for the eyes actually change the angle of vision without changing focus. By turning the screw farther, the angle can be still further changed, the eyes again assuming the new position. This can be continued in easy steps until the muscles fatigue, and, relaxing, resume their customary angle for that focus. It will then be noticed that there are two images. (Incidentally, engineers, microscopists, &c., who are accustomed to use the eyes more or less independently, are able to decrease the angle of vision much farther than others.) This leads me to believe that, by the use of this instrument, the eyes of "cross-eyed" children may readily be corrected by the purely gymnastic exercise suggested above, and the few experiments made bear out this belief.

In this connexion it may not be amiss to mention an interesting observation in this line. To measure, unaided, the distance from centre to centre of one's own eyes, all that is necessary is to hold the first and second fingers, about three inches apart, before the eyes, meantime looking past them, focussing the eyes infinitely far in the sky. There will appear, indistinctly, four fingers. Gradually close the fingers until but three are seen. They are now exactly the width apart of the pupils, and represent the distances two stereoscopic pictures should be placed from centre to centre to be easiest viewed stereoscopically by the unaided, trained eyes. A pair of dividers may be used for more accurate measurements.

C. FRANCIS JENKINS.

#### HYDRAMINE: A NEW DEVELOPER.

[Revue Suisse.]

AMONG the numerous substances which we have obtained in our experiments on introducing developing groups into amines and phenols, we may draw attention to one of which we have made a special study, which, when used as we describe below, forms an excellent developer. It is a definite combination of hydroquinone and paraphenylene-diamine, obtained by the direct interaction of these two substances, and is, according to our analysis, a molecular compound of these two bodies without the elimination of any elements. It is possible that the two hydroxyl groups of the hydroquinone are saturated by the two amidogen groups of the paraphenylene-diamine, the groups which give rise to the developing properties of the two substances being left intact, as the formulæ represent:—



To avoid the difficulty of naming this compound in accordance with its chemical constitution, we propose giving it the purely conventional name of "hydramine."

Hydramine occurs in beautiful white scales, melting about  $194\text{--}195^\circ\text{C}$ . to a brownish red liquid. It is sparingly soluble in water (1 part in 500 parts of cold water), more soluble in hot water (five per cent. at  $100^\circ\text{C}$ .), sparingly soluble in cold alcohol, soluble in acetone, and dissolves easily in acids and alkalis. The alkaline solution becomes gradually brown in the air, but the change is retarded by the presence of soda sulphite. At a boiling heat acids and alkalis decompose it into its two components. Ferric chloride gives, in aqueous solutions, a dark blue colour, changing rapidly to dark red. Excess of ferric chloride converts the compound into quinone.

A plain solution of hydramine in water is a developer of the latent image, but its action is so slow, and the resulting image so feeble, that, from a practical point of view, the developer in this form need not be considered.

Sulphite of soda, added to this aqueous solution, does not increase the developing power, a difference which marks off hydramine from compounds which contain two developing radicles in the same aromatic nucleus. Even if alkaline carbonates be added to the solution, which already contains sulphite, it is not possible, however the proportions of sulphite and carbonate be varied, to develop a vigorous image; the plate develops slowly, and the negative is flat.

If tribasic phosphate of soda is used in place of the carbonate, the development is quicker, and yields a more vigorous, though still flat, image, and this happens whatever proportions of reagents are employed. Acetone and sulphite of soda, in conjunction with hydramine, give an energetic developer, which gives stronger images than does carbonate or tribasic phosphate, but still very inferior to those resulting from the use of a small dose of caustic lithia in the developer. But we will not further dwell on the various ways in which the developer can be "alkalinated," except to speak of what we consider the best, viz., with caustic lithia.

Very small quantities of lithia, added to the soda sulphite solution of hydramine, greatly augment its developing power. The image appears quickly, and the half-tones show a normal gradation. With a view to determine the best formula, we tried various proportions of sulphite and of lithia. We found the best proportion of sulphite to be 15–16 grammes of anhydrous salt per litre (=13–14 grains of crystallised sulphite per ounce). More causes loss of vigour; with less the solution deteriorates quickly. If the lithia is kept below 2 grammes per litre



( $\frac{1}{15}$  grain per ounce), the image is feeble; 3 grammes per litre ( $\frac{1}{15}$  grains per ounce) is the best strength. The addition of any more will not increase the energy of the developer.

We may put the normal developer as follows:—

Hydramine .....	5 grammes	2½ grains.
Sulphite of soda (anhydrous)...	16 "	7 "
" " (crystallised)...	"	14 "
Caustic lithia .....	3 "	1½ "
Water .....	1000 c.c.	1 ounce.

This solution gives good gradation in the half-tones; the image comes up quickly, gains strength gradually, and can be brought to an intensity equal to that given by the most energetic of developers. Owing to the low proportion of alkali, there is no softening action on the gelatine. The solution, prepared as above, is colourless, and will keep practically unchanged in a corked bottle. It does not stain the skin to any extent worth speaking of.

One point which must be mentioned is its great sensitiveness to the action of potassium bromide. One c.c. of a ten per cent. solution has a very marked action on 100 c.c. of developer (this is at the rate of  $\frac{1}{4}$  grain per ounce of developer). With 10 c.c. of potassium bromide solution development is quite arrested, so that it will be seen that the developer lends itself freely to the correction of over-exposure.

In conclusion, it is curious to note that the direct combination (without elimination of water) of two bodies possessing developing properties—of which one, hydroquinone, is acid, and the other, paraphenylene-diamine, is basic in character—should give rise to a compound possessed of such striking developing properties as to act properly in conjunction with a small quantity of caustic alkali. That hydramine does act thus must probably be attributed to the fact that the groups of the two components saturate each other.

It is equally interesting to note how different is the action of alkaline carbonates, acetone, sulphite, and tribasic phosphate of soda upon hydramine from what obtains with many developers, with which these alkalies or their substitutes react like caustic alkalies.

Lastly, the retarding action of small quantities of bromide is equally noteworthy, for it is well-known that this is exhibited in connexion with only a few organic developers.

LUMIÈRE BROTHERS AND SEYEWETZ.

### THE LADY IN THE RECEPTION ROOM.

For a lady to be a success in the reception room she must be well supplied with tact, highly intuitive, a quick thinker (says Miss Ida M. Smith in *Wilson's Photographic Magazine*), slow to anger, and pleasant and courteous in manner, straightforward, energetic, and business-like in conversation, careful and artistic in dress, but not over-dressed. Add to this a knowledge of people and business, and she will win the confidence of all classes. She should have a feeling of joy and pride in her work, and be allowed freedom in method. A look into other studios and a chat with other work people will aid in the matter of enthusiasm, stimulate self-improvement, and preserve a cheerful disposition. Courage is half the battle in dealing with people. As a person enters the room I "size them up," and am ready for them by the time it is necessary to discuss styles and prices. The successful clerk at the dress-goods counter will bear more imitating in many ways, but I must do more than he. Whether I get the order or not, I must make friends, and, if they are not ready for a sitting, I must make them feel that we can do the work satisfactorily. I assure them that it is a pleasure to show samples, and, should they call again, will be glad to make it a special point to please, and hand them a card, so that they will not forget the place. I must know how to make suggestions as to dress and arrangement of hair, or in many cases I will fail. To admire a dress a lady is wearing will sometimes catch an order. If a child is brought in, I must admire it, whether it be a prospective subject or not. The mother knows the child is pretty, and I ought to. As far as possible I try to make a person feel that I am studying to give them just what they will feel best satisfied with when the work is finished. I believe truthfulness will work best in the end, but I need not utter painful truths. Policy and tact will keep the path smooth. Stating prices should be done incidentally; I often show the \$8.00 work when I know the \$5.00 work is wanted; \$5.00 will sometimes frighten, when it will not sound so bad after hearing the higher price, while others would rather pay \$7.00 for the \$5.00 work. While one customer must wait for another, I try to entertain the one who waits.

I make it a point to examine all negatives before proofs are made, and retouch where improvements can be made. Having secured my proofs, I study them, to know them and be ready to meet criticism or make suggestions should a resitting be desired. I think it poor policy to persist in urging a person to accept a proof they do not like, unless they be of the number who are never pleased or desire unreasonable things. No matter how good a negative may be as to lighting, exposure, and development, if the expression is blank or troubled, or the posing stiff, it should never be urged unless it be the best that can be done with that particular patron.

While I am showing a proof, my time is fully occupied; it is no time to talk prices to another. The average person imagines it a mark of

modesty to frown at a proof, and, after a little fussing, will grant that it is a good picture. If I am sure the proof will call out favourable comment, it will aid me greatly to show the proofs while another is looking around. The same rule holds good in delivering work.

Having once secured a name, I must remember it if possible, but, if not, must remember the face, and, by a little tact, can get the name without saying that I do not know them. Sometimes I can recall circumstances and find the name by referring to the book. A little real study and method will make this comparatively easy, and is well worth the effort. Where I feel sure of pleasing without harming myself, I make it a point to recognise customers on the street or at public gatherings.

If it is made an object to a lady, she can cultivate a wide acquaintance and draw trade; but it is expensive to be much in society, and she cannot do it unless there is some recompense.

To do my best, I must not be crowded every moment and required to put in my time just to make sure I earn my wages. I must do some thinking, and it must come in during working hours. If I work faithfully the year round, unless my wages are especially good, I think I have a right to the dull season for some self-improvement and rest. Such a matter can easily be overdone on either side, but I will do my best work for the man who takes pleasure in my good.

### THE LATE W. B. BOLTON.

As we foreshadowed would be the case, a fortnight ago, it was humanly impossible for Mr. W. B. Bolton to recover from the disease of cancer from which he had been suffering for several months past, and he died on Friday morning, May 12. Only eight hours afterwards his mother was also removed by death, and she and her son were buried in the one grave on Tuesday last.

William Blanchard Bolton was born at York in the year 1848. It was in the month of September, 1864, that the collodio-bromide emulsion process, with which his name and that of the late Mr. B. J. Sayce were associated, was published in the pages of *THE BRITISH JOURNAL OF PHOTOGRAPHY*, so that, although still, comparatively speaking, a young man at the time of his death, he had been before the photographic world no less than thirty-five years. In the year 1865 his name figures in our *ALMANAC* as the Honorary Secretary of the Liverpool Amateur Photographic Association. With the exception of our esteemed friend, Mr. James Alexander Forrest, one of those originally associated with the Editorial direction of the *Liverpool and Manchester Photographic Journal*, we believe that all Bolton's Liverpool friends have passed away.

In the month of January, 1874, Bolton published in *THE BRITISH JOURNAL OF PHOTOGRAPHY* a washed-collodion emulsion process; and for several years considerable commercial success attended the method which owes its origin to him of removing all the soluble salts from the emulsion and adding an organifier. This amounted to an almost revolutionary improvement in the unwashed process of Sayce and Bolton, introduced ten years before; and, looking back, it must appear strange that so obvious an improvement should have escaped notice long.

For many years one of its most valued contributors, Bolton became Editor-in-chief of this *JOURNAL* on January 1, 1879, and occupied that position until the end of 1885, when the late Mr. J. Traill Taylor resumed his occupancy of the chair. During the years 1879-84 Bolton's writings and experiments on the preparation of gelatine emulsion were both valuable and voluminous, and there is no doubt that in the early days of the new process much useful knowledge was gained from what he published in these pages on the subject.

For several years past deafness and other causes obliged Mr. Bolton to live in the country and absent himself from photographic society meetings and so forth, so that he became a little out of touch with current photographic matters; but he retained his intellectual vigour almost to the very last, as a letter we received from him shortly before his death amply shows. In other circumstances Bolton might have filled a foremost place in photography to-day, and we are sure the news of his painful end will be learned with great regret by many of the old school. He leaves a widow, but no children.

### YORKSHIRE PHOTOGRAPHIC UNION.

A MEETING of delegates was held at the Leeds Institute, Coobridge-street, Leeds, on Thursday evening, May 11, the following gentlemen being present: Messrs Godfrey Bingley, P. Lund, J. Taylor, Dickinson, J. W. Holland, Hansworth, T. Heaps, H. W. Briggs, P. Sheard, T. W. Rhodes, J. C. Coultas, J. A. Ashby, and Ezra Clough, Hon. Secretary.

Mr. Percy Lund having been elected to the chair, the meeting received the report of the sub-committee as to the proposed excursion to Selby, and after some discussion they were empowered to carry out the necessary arrangements to make the visit a success. The date finally fixed for the excursion is Saturday, June 17 next.



As to the programme, the morning will be devoted to photographing the Abbey, and afterwards the members will proceed by special train to Cawood Castle, where the cameras will be busily employed obtaining pictures of the Castle and the river scenery, and, returning to Selby, dinner will be served at the Londesborough Arms Hotel at six o'clock.

The Secretary was instructed to obtain the collection of slides from societies and members of the Union for circulation, in accordance with the objects of the Union, during the coming winter sessions.

Messrs. Godfrey Bingley (Leeds P. S.), Alexander Keighley, F.R.P.S., Percy Lund (Bradford P. S.), and Percy Sheard (Batley P. S.), were unanimously appointed the official Judges of the Union.

The next meeting in connexion with the Union is to be held at Halifax, on June 22.

## Our Editorial Table.

### THE CUT-FILM SWALLOW CAMERA.

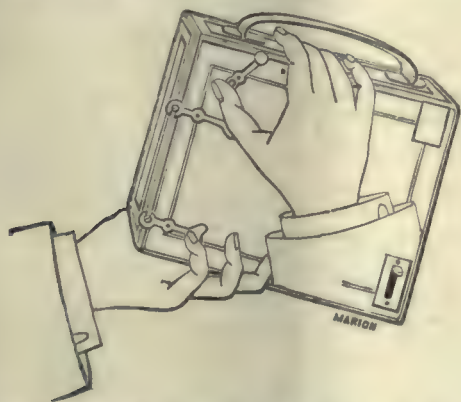
Marion & Co., Soho-square, W.

The leading features of this ingenious hand camera for taking cut films may be thus summarised:—

Its outside measurements are  $8\frac{1}{2} \times 6\frac{3}{4} \times 4\frac{1}{2}$ . It takes thirty quarter-plate flat films, without notches. Its weight loaded is 4 lbs. The lens is a single achromatic; it has three diaphragms. The camera is provided with two finders, one for upright and one for oblong pictures. It has an instantaneous shutter, with adjustment for time exposures. A carrying strap handle is placed at the top of the camera.



The user of the camera is advised, before inserting the sheaths in the camera, to see that the number 30 is shown in a small opening at the side. This is done by working the lever at the side of the camera to and fro until the number 30 appears. The films slide easily into the grooves of the sheaths. As the sheaths are filled, place the little projecting pins at the bottom of the sheath, on the runners on either side of the interior of the camera, and slide into place, back of sheath towards back of camera. The sheaths may be inserted in any order, with the exception of one sheath, which will be found to be extra thick and heavy. This sheath, which is easily recognisable by its weight, must be inserted last of all.



Its object is to receive the pressure of the spring on the door of the camera without bending. When all the sheaths are inserted, close the door of the camera, and the spring on the door will keep them in place.

To change the film, the following are the instructions: On the upper right-hand side of the camera will be found a small lever. Hold the camera in the left hand firmly, the front of the camera well downwards, as shown in the illustration. Rest the fingers of the right hand on the top of the camera, and the thumb on the top of the lever. Smartly press the lever down and round, so that it makes a circular movement from

pin to pin, then bring the lever back to its original position. The film will be heard to drop, and at the same time the number at the side of the camera will be found to have changed from 30 to 29, thus denoting that there are 29 more films left to expose. This number changes automatically every time a film is changed, the number indicating always the number of films left to be exposed. This changing of the film should be done immediately after each exposure; thus the films will be found to have moved in succession from the vertical position at the back of camera to a horizontal position at the bottom of camera.

The many admirable points in the Cut-film Swallow Camera should render it exceedingly popular.

### THE SIMPLEX CHANGING AND DEVELOPING TENT.

Manufactured by F. Beresford, 14, Bridge-road West, Battersea, S.W.

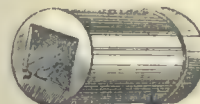
MR. BERESFORD has submitted to us the latest form of his changing and developing tent, which well deserves its description of "a model dark room, that can be erected or closed in one minute." It consists of a neat box containing the tent, &c., when closed, and it opens like a book and forms the foundation. Two light iron uprights and a crosspiece drop into sockets, and the fabric is drawn over this framework, and fastened underneath the box. It is fitted with a window of ruby medium, two sleeves, and a facepiece, which leaves the mouth free for breathing out-



side. The 'greatest freedom is given to the hands and head.' A sink, specially prepared to resist the action of chemicals, is fitted, large enough to hold three half-plate dishes. The remaining space is amply sufficient for dark slides, chemicals, water bottles, &c., whilst a movable india-rubber waste pipe is fitted to the sink. The measurements of the tent are: erected,  $20 \times 20 \times 20$ ; closed,  $20 \times 10 \times 8$ ; and its weight about six pounds. Either closed or open, it is exceedingly portable, and is very roomy or comfortable to change or develop in. Mr. Beresford has long been noted for the practicability of his developing and changing specialties, and the tent under notice is a really useful piece of apparatus, which should be greatly appreciated by travelling photographers. It is well made and cheap.

### BERESFORD'S RECTISCOPE.

THIS is a handy little prismatic instrument for enabling the photographer to view the inverted image the right way up. It may be used under the focussing cloth, and gives a brilliant image with perfect definition. The instrument may also be used as a focussing magnifier, a movable lens



being provided for that purpose. Used in this way, there is the advantage of viewing the magnified portion of the picture in its non-inverted position. The rectiscope will be appreciated by many who value the acme of convenience in focussing.

### GRIFFIN'S RAPID HYPO FIXER.

J. J. Griffin & Sons, 20-26, Sardinia-street, Lincoln's Inn-fields, W.C.

IN sending us a sample of this fixing agent, which is sent out in the convenient form of exceedingly fine pulverulence, Messrs. Griffin point out that it is suitable for plates, films, or lantern slides. It is unfortunate, they add, that the hypo crystals used in such large quantities for photographic purposes should be supplied, up to the present, in a form so unsatisfactory to the consumer, besides bringing little profit, if any, to the retailer. The crystals soon absorb moisture, are unpleasant to handle, dissolve with difficulty, are unequal in action, and to many, who often work in a hurry, are the cause of stains, spots, and unequal fixation. The Rapid hypo is introduced to permanently displace the crude hypo now sold. Besides its more expeditious fixing action—due to an exact degree of concentration—it clears and hardens the emulsion, destroys



etains, and contributes to permanency. The price has also been fixed so low that it is hardly more expensive than ordinary hypo and is undoubtedly far more economical in the long run.

Each box is waxed to exclude air, and contains two charges, separated by a cardboard disc. Thus amateurs who wish to fix only a few plates can do so, and leave the second charge for another occasion. Each charge makes ten ounces of fixer for plates.

We can speak from personal experience of the great convenience of using hypo in the form here mentioned, and have no doubt that many other photographers will appreciate their hypo in the state of fine powder, having all the features claimed for this.

*To Mountain, Castle, and Crag by an Ocean Route* is the title of a well-illustrated book issued by the Aberdeen Steam Navigation Company, describing a number of attractive Scotch tours by land and water.

## News and Notes.

**PHOTOGRAPHIC CLUB.**—Wednesday evening, May 24, at eight o'clock. Open Night.

**THE AUSTIN-EDWARDS MONTHLY FILM NEGATIVE COMPETITION.**—The prize camera for the current month has been awarded to Mr. W. B. Green, Grasmere, Gladstone-road, Watford, for his negative, *Primroses*.

A JOINT outing of the Borough Polytechnic and Cripplegate Institute Photographic Societies took place on Saturday last to St. Paul's Cray. Both Societies were well represented, and, favoured with fine weather, the innovation proved highly successful.

**THE DERBY EXHIBITION.**—Messrs. Byrne, of Richmond, write: "In your last issue you give a list of the names of those who have accepted the invitation to exhibit at the forthcoming Exhibition. In that list our name does not appear, although we accepted the invitation to exhibit frames."

**ROYAL JOURNEY TO THE NORTH POLE.**—H.R.H. the Duke of Abruzzi has just left Rome for Scandinavia for his expedition to the North Pole. It is calculated that the journey will occupy eighteen months, and will cost three million francs, of which one-fourth is provided by the King. Messrs. Adams & Co. have had the honour of supplying the expedition with photographic apparatus, including a Tella film camera.

**THE SANDELL "PERFECT" COMPETITIONS.**—The following are the results of the April competitions of Sandell Films and Plates, Limited: 10*l.* prize, Mr. C. Speight, Kettering; 5*l.* prize, Mr. F. W. Fielder, Guildford; 1*l.* prizes, Messrs. Julius A. Kay, Southampton; G. W. Morgan, Aberdeen; Arthur Waterall, Flixton; John H. Coath, Liskeard; Edwin Matthews, East Dulwich; the Rev. C. J. Metcalf, Ambleside; Messrs. H. R. Campion, Ely; William McClean, Belfast; S. M. Hibberd, Seaforth; and William Towell, Coventry.

MR. WILFRED EMERY writes: "I wish to thank you for your kind notice in last week's BRITISH JOURNAL OF PHOTOGRAPHY, and to draw your attention to a slight slip of the pen, but one which would create a very false impression. You describe me as *agent* for the folding "Apeks." Now, the word "Apek" is my special property, and applied to goods which I either make, or have specially made for me, or take especial trouble to push, so that the term *agent* might lead the trade to believe that the "Apek" trade mark belongs to some one else. I trust you will be able to correct this.

**THE WARWICK MONTHLY COMPETITION.**—The prize-winners in the Warwick Monthly Competition for May are as follows: 1*st* prize, 10*l.*, Mr. F. W. Fielder, Foxenden-road, Guildford, *Lady in Victorian Dress*; 2*nd* prize, 5*l.*, Mr. John M. Whitehead, George-street, Alva, N.B.; twenty prizes of 1*l.* each, Messrs. A. George, W. G. Elcombe, R. H. Beavan, C. Sordes Ellis, J. H. G. Ridley, J. Walker, Thomas Knox, Harold Baker, F. Whaley, Ernest Coath, Cecil D. Palmer, F. G. Dalby, H. E. Watkin, Albert Durn, Gus. Edwards, Charles Speight, G. Campbell Dickson, Ernest Oetzmann, Misses M. Craigie Halkett, and F. Yate-Lee.

**TRANSPARENT PAPER.**—There are several methods of rendering paper transparent. Coat white paper with a solution of Irish moss in water, to which a slight quantity of previously dissolved gelatine has been added. It should be applied hot to the paper. When colours are desired they must be transparent; they must be ground in varnish, and a stronger varnish is required than for opaque colours. A fine yellow may be produced by using yellow lake and red sienna. These make a warmer colour than the yellow lake alone. If cost is no objection, auramine may be used. For pale red, madder lakes should be employed, but for darker shades crimson lakes and scarlet cochineal lakes. The vivid geranium lake gives a magnificent shade, which, however, is not at all fast in sunlight. The most translucent blue will always be Berlin blue. For purple, madder purple is the most reliable colour, but possesses little gloss. Luminous effects can be obtained with the assistance of aniline colours, but these are only of little permanence in transparencies. Light transparent green is hardly available. Recourse has to be taken to mixing Berlin blue with yellow lake or red sienna. Green chromic oxide may be used if its sober, cool tone has no disturbing influence. Almost all brown colouring bodies give transparent colours, but the most useful are madder lakes and burnt umber. Grey is produced by mixing purple-tone colours with suitable brown, but a grey colour hardly ever occurs in transparent prints. Liquid siccativ must always be added to the colours, otherwise the drying will occupy too much time. After the drying, the paper must be varnished on both sides. For this purpose a well-covering, quickly drying, colourless, not-too-thick varnish must be used, which is elastic enough not to crack nor to break in bending.

A NEW method of marking glasses of spirit levels and other instruments has been devised by a Connecticut concern making levels and other instruments. The usual way of marking glasses is to scratch lines on the surface of the glass, but the skin of the glass is thus weakened and the glass itself made very liable to fracture. In the new process, by fusing the glass at the mark and incorporating with it minute particles of metal, a coloured line is obtained. The metal is imbedded in and enclosed by the glass, which effectually protects it. In fact, the glass at the grooves has been so strengthened that it will break first at some other point. In addition, the line is absolutely indelible and permanent, and is sharp and well defined. This is effected by bringing the spirit tube up to an iron disc rotated at a velocity of about 2500 revolutions per minute. The frictional heat generated practically fuses the glass at the point of contact with the wheel, and in this fused portion fine particles of iron given off by the wheel are imbedded. A microscopical examination of the line proves this to be true. An actual mechanical union of iron and glass is the result.

**APPARATUS FOR UTILISING THE SUN'S RAYS.**—It is well understood that the great desideratum for the successful working of apparatus dependent upon the sun's heat is that the sun should shine uninterruptedly upon it through air devoid of all moisture. With this in view, a machine is proposed (says *Le Monde Scientifique*) for realising this requisite by storing the sun's heat. This consists of a large conically shaped reflector of highly burnished copper, which has located in its centre a boiler made of heavy glass. The heat obtained is stored in a reservoir of sand, surrounded by a heavy woollen covering, which is said to effectually prevent the heat from radiating, while retaining it in the sand until it is required; and the reflector may be moved backward or forward in a horizontal plane by means of a lever, while a pair of cog wheels running in a toothed rack enable it to be elevated or depressed. In operation, the conically shaped funnel is set at the proper angle facing the sun, and the heat converging upon the reflector from all directions is transmitted to the reservoir of sand; engines and dynamos may thus be operated under this arrangement by simply drawing out the heat thus stored up.

## Patent News.

THE following applications for Patents were made between May 1 and May 6, 1899:—

**CINEMATOGRAPHS.**—No. 9552. "Improvements in Cinematographs." J. PESCHER and G. H. CHARD.

**CHANGING BACKS.**—No. 9574. "Improvements in Changing Backs or Magazines for Films, Plates, or the like, to be exposed in Photographic Cameras." M. NIELL and J. STUART.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
22.....	Borough Polytechnic .....	Excursion: Burnham Beeches. Leader, F. W. Bannister.
22.....	Bradford Photo. Society .....	Open Night.
22.....	Kingston-on-Thames .....	Excursion: Shere. Leader, A. E. Smith.
23.....	Hackney .....	Lantern Evening: A Trip on a Norfolk River.
23.....	Ludlow .....	Excursion: Penbridge, Herefordshire.
23.....	Royal Photographic Society .....	Corea. Mrs. Isabella Bishop, F.R.G.S.
24.....	London and Provincial .....	Important Photographic Problems that Require Investigation. Herbert J. Starnes.
24.....	Photographic Club .....	Open Night.
25-31 .....	Ashton-under-Lyne .....	Exhibition of Loan Collection of Pictures Toning Gelatine Emulsion Paper. W. A. Nash.
25.....	Oldham .....	Conversational Meeting.
26.....	Croydon Microscopical .....	Excursion: Warwick. Leader, Harold Baker.
27.....	Birmingham Photo. Society ..	Excursion: Storeton and Bebington. Leader, G. A. Carruthers.
27.....	Liverpool Amateur .....	

### ROYAL PHOTOGRAPHIC SOCIETY.

MAY 16.—Photo-mechanical meeting.—The Right Hon. the Earl of Crawford, K.T., F.R.S. (President), in the chair.

#### COLOURS IN PLATINUM PRINTS.

Mr. J. C. H. WALLSGROVE forwarded a platinotype print of some flowers, the image being partly in brown and partly in black, together with a note explaining the method by which he obtained "three distinct colourings—black, white, and brown—direct in one printing from a single negative, without further treatment of the prints." The process appeared to consist in over-exposing platinum paper under a negative possessing full contrast, the variation in colour being due to solarisation.

#### IRREGULAR GRAINED SCREENS.

Mr. DAVIS (representing Messrs. E. S. Hunter & Co.) exhibited specimens of the "Haas" grained screens, with specimen prints, in black and white and in three colours, from negatives made with the screens.

The PRESIDENT, Colonel WATERHOUSE, and several members spoke very highly of the excellence of the results shown, and of the great uniformity in the distribution of the grain of the screens, several of which were passed round for examination.



## COMING EVENTS. THE SOCIETY'S NEW HOME.

It was announced that on Tuesday, June 20, the President and Council would receive the members of the Society, and of affiliated societies, at No. 66, Russell-square, and the President expressed the earnest hope that that occasion would be the inauguration of a long and prosperous career for the Society. The arrangements in the mean time are as follows:—May 28, Technical Meeting. "Korea," by Mrs. Isabella Bishop. June 13, Ordinary Meeting. "Acetylene," by Professor Vivian B. Lewes.

## LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 11.—Mr. T. E. FRESHWATER opened a discussion upon the subject of Modern Photographic Lenses, and showed one of the smallest of these, the Zeiss Planar, Series A, No. 2 35 mm. focus, 12 mm. diameter. He exhibited some photographs of very curious spiders that he had just made with this instrument, working at full aperture, in conjunction with his photomicrographic apparatus, and in which the definition and crispness of the hair left but little to be desired. He next passed round two or three of the new stigmatic lenses of Messrs. J. H. Dallmeyer, Limited, and from the remarks made by the meeting it appeared that this series of lenses was very much in favour.

Mr. J. E. Hodd brought up several lenses, including the convertible Ross-Satz, Series IIIA, working at 7.5; the Cooke Lens, Series V; Voigtlander, Series III; and Wray's Platystigmat.

Mr. F. C. Kellow showed some photographs made with a hand camera, fitted with the Ross-Zeiss, Series III Lens, of 3½ focus.

Mr. PHILIP EVERITT had several lenses of various makers, amongst which were Steinheil's orthostigmat, Series II, and Dr. Schroeder's concentric lens, which, he said, was the first to employ the new glass in its construction. The same speaker had had a Ross-Zeiss fitted to his hand camera, the advantage of the lens being that it could be also used with a 7½×5 camera; moreover, used singly, the focus of the back combination was nine inches and the front eleven and a half inches, with no marginal distortion.

Many other lenses were brought forward and shown, and a long discussion ensued upon their various qualities and peculiarities.

**Croydon Camera Club.**—A comparison of hand cameras formed the staple on Wednesday, the 10th inst., when a considerable attendance of members, and a good show of various types of the hand camera, ensued. The PRESIDENT described a cartridge Kodak, pointing out both its strong and weak points, this wholesome precedent being generally followed. Mr. CHADWICK TAYLOR spoke up for the Frena, Mr. PACKHAM doing the same for his Tella, which is a remarkably compact and ingenious instrument, carrying fifty films. Mr. BEN EDWARDS explained a Verascope, and showed stereoscopic results obtained with it. Mr. Willeocks exhibited a Gear model hand camera, made to use with lenses of foci from three to ten and a half inches, rising front, vertical swing, focussing screen, T.-P. shutter, four double backs, cost, without lens, 41. 8s. 6d. This was considered a capital type of all-round hand camera for serious work. Mr. Rogers was represented by the Bruno, which is only less convenient than the foregoing on account of its greater size. Mr. J. Smith showed the Dresser pattern hand camera (made by Hirst). Mr. CARR claimed approval for the Yale, a newly contrived compact instrument working on the bag-changing system. Twenty-four films, or twelve plates, are usable at each change. It was thought good value at 54. 11s. Mr. PEARCE spoke of his Rover hand camera, which has been his companion over many thousands of miles. In a humorous speech he dwelt on its imperfections, which, he said, had rather endeared him to the camera in question than otherwise. Mr. Mote brought forward a Munro pocket camera. Messrs. Pym, Noaks, and others also showed cameras, including Shew's Eclipse, now well known for its utility and portability. At the conclusion of the main subject, Mr. BEN EDWARDS described a new light-filter for use with isochromatic plates. In the subsequent discussion Mr. CHADWICK TAYLOR stated that a certain make of plate claiming to be isochromatic gave no better results than an ordinary plate tested against it, using in each case a yellow screen. Mr. PACKHAM stated that not all plates possessed the degree of isochromaticism indicated by the labels on the box. But the best makes of isochromatic plates, such as Edwards's, were, he found, from their action in microscopical photography, much in advance of ordinary plates for full-colour rendering. An excursion, at short notice, was held on Saturday, and proceeded, in charge of Mr. S. H. Wratten, for a photographic ramble *via* Croyham Hurst to Addington Hills.

**Croydon Microscopical and Natural History Club (Photographic Section).**—On Friday evening last a circulating lecture on

## HAND-CAMERA WORK, WITH A VIEW TO ENLARGEMENT,

by Mr. J. H. Gear, was read. If it is permissible to criticise these lectures, we would say with regard to this one it struck us that, while it was a fairly good exposition of photography generally, treated in a somewhat elementary manner, the main subject as indicated by the title was rather lost sight of, for instance, what kind of negative was most suitable for enlargements, and the class of negative which was unsuitable, pointing out how to obtain the best kind, which would depend rather on development than exposure, and illustrating these points by the negatives themselves as well as lantern slides. On one or two points we should not feel disposed to agree with the author, and some of the slides, we should think, could hardly have been made from negatives produced strictly by the hand camera, but by a hand camera used as a stand camera, judging, that is, from the exposures which must have been necessary. In saying this we do not for one moment wish to deny the capability of those gentlemen who produce these circulating lectures, that is too well known and recognised to need any defence, but rather to the treatment of the subjects by some of them. Of course, if the subject must be treated in an elementary manner, for the benefit of certain members of the

societies receiving the lectures, then it seems a reflection on certain other members, who could, and perhaps ought to, render the necessary information to their less experienced brethren. It is like paying some one else to do work that one could do equally well oneself. If that is not the object, then we would suggest that the lectures should be less elementary, and give us a little more of the benefit to be derived from the experience of masters of the art.

**Leeds Photographic Society.**—On Tuesday evening, May 9, Mr. Frank M. Sutcliffe, of Whitby, was to have delivered his lecture on

## SOME EXPOSURES

to the members of this Society, but, to the regret of every one present, the PRESIDENT (Mr. Godfrey Bingley) announced that Mr. Sutcliffe was unfortunately laid up at home in bed, and forbidden to come to Leeds by his doctor. The lecturer had, however, done the next best thing to coming himself, and that was to forward his manuscript, which he would read to them, and he asked for the indulgence of the audience if, in doing so, the lecture did not run as smoothly as it would otherwise have done. In the course of the paper the writer said the Americans had a saying, "Be sure you are right; then go ahead," and that was just what every photographer ought to remember to do, and, when we had found a suitable spot, there was nothing to stop us going ahead when our nerves and instinct show us we are right. If there was one thing photographers had to be proud of, it was that they had made evident the beauty of the heavens. Fifty years ago Ruskin told the people how much they lost by not looking at an ordinary sky and the clouds which passed over it, but it had remained for photographers to demonstrate, by practical examples, the unparalleled beauty of cloud forms. There was no photographer worthy of being called such who had not taken as many photographs of the clouds as the earth. Sometimes, when taken over the sea, they formed a not inharmonious whole. Stock negatives of clouds came in very useful. He could well remember the time when all photographs which were considered good had perfectly white skies, and if they did not print white the negative had to be painted to make them so. If there were any photographers there that night who had not gone in for taking the sun, it might save them a headache if he told them to provide themselves with a smoked glass to watch the clouds through. In many instruction books the student was advised to go over a district without his camera, make up his mind when the sun would be in the best position, and go next day and take each view as decided. This advice always seemed very foolish to him, as anything worth photographing was not likely to happen twice. The lecture was illustrated by as fine a series of slides as it has been our lot to see for some time, and comprised almost every class of subject, but principally scenes of Whitby and the fisher folk "snapped" in their native haunts. The paper, which occupied an hour in reading, was a very interesting one, and full of practical hints to photographers. At the conclusion of the lecture the SECRETARY announced that Messrs. T. H. Oxley and W. S. Crowther had been elected members of the Society.

## Correspondence.

\* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* We do not undertake responsibility for the opinions expressed by our correspondents.

## SPOTS ON PRINTS.

To the Editors.

GENTLEMEN,—Having noticed, in a recent issue of the JOURNAL, queries respecting the above, it may be worth while to call attention to the cause of this annoyance, which gave me considerable trouble some time since. After many fruitless efforts to discover cause for small brown spots, apparently sprinkled over the prints (generally the cabinets and cartes), I eventually found it to proceed from minute particles of iron distributed over the mounting table by revolutions of the roller squeezes I had then in use. This conclusion is supported by the fact of continual wearing away of pivots of roller when in use; also by total disappearance of spots from the time of its being put aside.—I am, yours, &c.,

Rosebank Studio, Winchester, May 16, 1899.

W. PALMER.

## A SOCIETY FOR PHOTOGRAPHIC PRINTERS.

To the Editors.

GENTLEMEN,—It would be impossible to correct all the statements made by Mr. Randall, as space would not allow of it. There seems to be but one way in which Mr. Randall views the matter, and that is through the already organized systems which exist. What I want to do is this, keep in view the original statements.

1st. I hold that photographic printers, or, for the matter of that, any photographic employes, can not be induced to join any of our trades unions, because it would simply mean ruin to them. They know that to be compelled to accept only a union rate of wage would be to stand on one side and allow others to take their places. Such is the present condition of things, and I think Mr. Randall admits this. It is, then, a question of what can be done, not what we should like.

2nd. Mr. Randall says I attempted "to maintain two lines of conduct which are contradictory" because I advocate a printers' union, which, as he (Mr. Randall) says, could not recognise the right of a member to



work for 11. when 21. would be a fair wage, and that the assistant cannot afford to join a union because he must accept what he can get, in which case the union would be quite useless. Now, if I misunderstand your able correspondent, I shall be pleased to stand corrected.

If Mr. Randall will refer to the first letter on this subject (April 21), and kindly read my last paragraph in that letter, he will see that my intention was not to set a wage limit (although this would come in due course with sufficient support and strength of members), but to have a general centre, where members could not only mutually improve themselves in their work, but where grievances could be ventilated, where printers could be classified, where the "trade" could apply for a man, and then we should have a printer remain a printer, as we have a plumber or a carpenter in the building trade remaining such. Let me again remind your readers that no assistant in photography can at present join a restrictive union, and I am afraid that, unless a society be formed on some such grounds as indicated, then no society will exist.

I should feel glad if some other correspondents would be good enough to express their opinions on this subject. In the mean time I am sure we are pleased with Mr. Randall's very comprehensive remarks, which he has so ably made, upon unionism.—I am, yours, &c.,

F. G. WILLATT.

101A, Fulham Palace-road, Hammersmith, W., May 15, 1899.

### THE RECENT FLASHLIGHT EXPLOSION.

To the Editors:

GENTLEMEN,—With reference to my recent accident, I should like to say it was in no way due to Maloni's four-jet lamp. The facts were as follows: In taking a flashlight photograph, my usual glass bottle being empty, I used a piece of cardboard to take the powder from the tin containing about two ounces of magnesium powder. In filling one cup, the cardboard caught in the jet. After blowing it out, and waiting for the heat to subside, I was in the act of taking more powder when the explosion occurred. I have used the lamp with much success, and was quite satisfied with it, and distinctly wish it to be understood that no blame whatever is attached to it.—I am, yours, &c., W. C. HARVEY.

124, High-street, Gosport, May 15, 1899.

### AN ADDRESS WANTED.

To the Editors.

GENTLEMEN,—Can you, or any of your readers, kindly give me the address of Mr. S. Wing, the patentee of Ferrottype Photo Apparatus, or the firm in England or America who make his apparatus? I have one of his patent machines, with some parts missing, which I would like to replace.

Hoping to be excused for taking up your valuable space, I am, yours, &c., A. W. ANDREE.

Hoptown Studio, Colombo, April 27, 1899.

[Some reader may perhaps be able to supply the address.—Eds.]

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

#### PHOTOGRAPHS REGISTERED:—

T. REVERLEY, Market-place, Wantage.—Photograph of men accused of the Horwell (Berks) murder, handcuffed to policemen.

J. LOWERY, 47, Newgate-street, Bishop Auckland.—Photograph of football team, Bishop Auckland team, winners of the Durham Cup and Northern League Championship, 1898-9.

T. FRASER and others.—In our next.

E. WILLIAMS.—Thanks for your letter.

GWYNFFA.—Possibly a dilute solution of citric acid would remove the stains.

H. RICKETTS.—If the photographs are really copyright, and have been duly registered at Stationers' Hall, you would run the risk of an action for infringement.

T. KING.—With the photograph as it stands there is no serious fault. It is, perhaps, slightly under exposed, and it might have been better if you had chosen the point of view a little more to the left; but otherwise it is very good.

LEGAL.—This is a matter into which we regret we cannot enter. Your best adviser would be a patent agent, although, having regard to the smallness of the matter and the fact that the larger proportion of so-called "photographic patents" run a serious risk of being declared invalid in the Courts, it would be very doubtful policy on your part to take legal proceedings. It might be a case of throwing good money after bad.

THE PROJECTED COPYRIGHT ACT.—C. R. You seem to be under a misapprehension. The new Bill has not become law, and it is possible that it will not be so without some amendments. Even if it were law now, it would not help you, and it would be very undesirable that it should. So would any law that would countenance piracy, and what you propose would be decided piracy in a disguised form.

DRYING COLLODIO-CHLORIDE PRINTS.—R. E. DAVEY writes: "I am told that collodio-chloride prints may be dried by blotting them off between blotting-paper. My experience has been entirely confined to P.O.P., which cannot be treated in that way, and I often require to dry prints in a hurry. Please say if I am correctly informed, because, if so, C.C. paper would sometimes be a boon to me!"—Yes, collodio-chloride paper may be blotted off, and the drying completed before the fire without injury, just the same as albumen prints may be.

COMBINATION PRINTING.—GROUP says: "I have taken a 12×10 group in which two spaces have been left for printing in portraits of gentlemen not able to be present when group was taken. I have good cabinet photographs, which I am about to reduce to exact size of those in the group, and should be glad to know which you consider the best way to print them in so as to show no join. I should require to print about twenty copies, and, as I have never done anything of the kind before, should like your advice."—An article on the subject, which will just meet our correspondent's case, will be found on p. 18 of our volume for 1895.

SPOTTING AND MOUNTING.—W. J. says: "I shall be glad if you will kindly inform me—1. What is the best thing to use to 'spot' prints to be enamelled that will not leave the picture when in water or gelatine? 2. Is there any method to mount an enamelled print so as to make the whole surface of the block adhere to the mount without injuring the polish of the photograph?"—1. There are special colours supplied for the purpose. Mr. Rudowsky, 22, Coleman-street, E.C., supplies them, so do most of the large dealers. 2. Yes, by pasting one or two thicknesses of paper on the prints when they are squeezed on the glass. When dry and stripped off, they may be mounted in the usual way.

GELATINE FOR MOUNTING PURPOSES.—D. McLEOD says: "I have recently been trying gelatine for mounting my prints, and I have used both Coignet's and Heinrich's, but my mounters say they cannot get on at all with it, as, before they can even cover a cabinet print, the solution sets. With the larger sizes the case is still worse. Can you tell me a remedy, as I often see that gelatine is recommended in preference to any other mountant?"—The cause of the trouble is the unsuitability of the gelatine for the purpose. What is required is one with slower setting properties, such as Nelson's No. 2 soluble, or Cox's soup gelatine. These, when used dilute, enable large surfaces to be coated before the mountant gelatinises.

VALUE OF LENSES.—GVALIA says: "A friend of mine showed me some lenses and wooden cameras, which he wanted to sell me. The lenses are from the following firms: One single landscape, one *carte-de-visite* portrait lens, by T. C. Ponting, Bristol, engraved on both lenses; also one portrait lens, *carte-de-visite*, by Jabez Hughes, London. This one is registered No. 4012. We had two wooden cameras, 5×4 and 7½×5½, if I am sure. What would you estimate the lot? Could I use the lens with Lancaster whole-plate camera?"—The lenses can, of course, be used on any camera. Neither of those whose names they bear were makers of lenses. They are of French make, though probably good, but, like the cameras, are of little market value, being very antiquated.

RESIDUES.—TONING BATH says: "Will you please inform me if the gold and silver from used toning baths can be saved and the method used to do so? I have occasion to use about five toning baths in a week, and always use a new bath for each batch of prints, of about sixteen cabinets. I use separate toning and fixing, and tone without previous washing, and have always thrown the used baths away, and should like to know if the gold and silver can be obtained from them."—The silver and gold can be saved, and the method of doing so has often been described in the JOURNAL; but, if gelatino-chloride paper be used, and the toning bath be well exhausted of its gold in toning, we doubt the economy of saving the residues from such a small consumption of paper.

MEALY PRINTS.—W. & B. write: "We have always used P.O.P., but, finding that so many of our prints turn yellow, we have recently been trying albumenised paper, both ready-sensitised and of our printer's own sensitising, but all our prints turn out mealy. We have used the acetate toning bath, made as follows: Acetate of soda, 1 drachm; water, 16 ounces; chloride of gold (Johnson's), 2 grains. We have used the bath directly it was mixed, also after keeping it an hour and up to three hours, but in all cases the prints turn out mealy. With the carbonate bath we get on all right, but we do not like the colours. Where are we wrong?"—In not keeping the toning bath long enough before using it. The acetate bath requires to be kept for at least twenty-four hours before it is used, or it will yield mealy prints.

ACETYLENE.—Acetylene, like the cinematograph, seems to be heavily handicapped. By an Order in Council, some time ago, calcium carbide was made petroleum within the meaning of the Act. Last week a London firm were proceeded against at the Thames Police Court, for permitting a vessel carrying forty drums of carbide of calcium to be navigated in a manner contrary to the by-laws made by the Conservators under the Petroleum Acts of 1871 and 1879 and an Order in Council of 1897. But the magistrate held that the carbide was not within the Act, and, if the Conservators thought it ought to be, they should pass a by-law dealing with it. The case was adjourned *sine die*, to enable the point to be considered. What with the restriction regarding the conveyance and storage of the carbide, the prospect of the acetylene light is not altogether promising in this country.



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## EX CATHEDRA.

JUST about this time of year the receipt of the *Handbook of Imperial Plates and Papers*, issued by the Imperial Dry Plate Company, Limited of Cricklewood, N.W., warns us to look to the Company for something practical and useful in the way of photographic information, and our expectations are again realised in the 1899 *Handbook* now before us. This is sent free of charge to applicants, and we may promise them that the book is well worth asking for. Mr. Gear writes on "Bromide Printing," and Rev. F. C. Lambert on "Errors in Exposure and Development and how to Recognise Them." Illustrating this paper is a set of nine half-tone reproductions from faulty and correct negatives, five minutes' study of which is an education in itself. It is one of the most useful and instructive papers we have recently read. The *Handbook* has about a dozen half-tone illustrations made from negatives on Imperial plates, which need no higher testimonial than the good qualities of these results. A table of percentage solutions, formulae, &c., are also included in the *Handbook*, which is only to be seen to be assured of the highest appreciation.

A RECENTLY published specification for an improved photographic developer is that of Herr Julius Hauff, whose invention relates to the "application of the chlorine, bromine, and iodine substitution products of hydroquinone, hydrotoluquinone, pyrocatechin, pyrogallols,  $\alpha$ -hydronaphtoquinone,  $\beta$ -hydronaphtoquinone for developing photographic pictures.

"For this purpose he employs halogen substitution products of hydroquinone, hydrotoluquinone pyrocatechin, pyrogallols, and hydronaphtoquinones for the development of photographic pictures. These products are distinguished by the fact that they develop quickly and very powerfully and are only in the slightest degree affected by the temperature. They are thus capable of excellent service in instantaneous photography and in the studio or laboratory. The halogen products of substitution are as follows:—

Water .....	100 cm.
Monochlorhydroquinone .....	1 gramme.
Crystallised sulphite of sodium ...	8 grammes.
Potash or calcined soda .....	4 "
Bromide of potassium (1 : 10).....	10 to 20 drops."

\* \* \*

WE are informed that the Derby Corporation Photographic Exhibition will be opened on Tuesday evening, June 6, by the Mayor, and that there will be a *conversazione* to which he will invite the members of the Corporation and the Derby Photographic Society.

\* \* \*

A MEETING of the Röntgen Society will be held on June 30, 8.0 p.m., at 11, Chandos-street, Cavendish-square, London, W., under the presidency of Mr. C. W. Mansell Moullin, F.R.C.S. A paper will be read by Mr. A. W. Isenthal, "Short notes on the Wehnelt Electrolytic Break." Mr. H. W. Cox will read some notes on the same subject. Mr. Apps and Mr. Wilson Noble will also speak. The apparatus will be demonstrated. Members who have worked with this Break are specially invited to attend and join in the discussion.

\* \* \*

THOSE of our readers who, at one time or another, have interested themselves in the Photographers' Benevolent Association may like to know that the fund of 300*l.*, which remained when the Association ceased its official existence, is in process of comparatively rapid extinction. With the approval of the



Registrar of Friendly Societies, the Photographic Club appointed a committee to administer the fund, which is being distributed among suitable applicants, of which, of course, there is no lack. The secretarial work of the Committee, which is very considerable, as that body meets weekly, is being performed by Mr. H. Vivian Hyde, to whom special recognition is due for the able manner in which he is filling a thankless office. The total disappearance of the Photographers' Benevolent Committee cannot long be delayed, and when the word "finis" is appended to its labours there will have been closed a chapter of history which reflects little credit on professional photographers and their assistants.

\* \* \*

PRESSURE of journalistic work prevented us from attending the funeral of the late Mr. W. B. Bolton on Tuesday in last week, but on the following Thursday we made our way to the pretty little village of Silsoe, in Bedfordshire, and saw the wreath-covered grave in which the remains of our late friend were laid only a few hours before. The churchyard, which contains all that is left of one who in past years contributed many important stones to the elegant edifice of modern photography, is situated at the gates of one of Earl Cowper's seats, Wrest Park. It will be learned with satisfaction that so much was Mr. Bolton liked in the village that business was entirely suspended during his funeral.

\* \* \*

WE have received from the Directors of the Crystal Palace the programme of general arrangements for the season 1899. It will be remembered that last year and the year before two great photographic exhibitions were held at the Palace. There appears to be nothing of special interest to photographers included in this year's programme; nevertheless, a glance through the latter shows that the Directors have included a great number of very attractive items, and it is to be hoped that the efforts being made this year to strengthen the hold of the beautiful Sydenham glass house, and its delightful grounds, upon popular favour, will meet with success.

\* \* \*

THE first number of the second volume of the *Birmingham Magazine of Arts and Industries*, published at 57, St. Paul's-square, Birmingham, has reached us. It contains fifty-five illustrations in half-tone, including one in three colours of a painting by Mr. Ormond E. Gollins. The aim of the *Birmingham Magazine* seems to be to represent all phases of local art and industry in their best aspects, and the editor appears to have a particularly warm corner in his heart for photography, as he has included a photographic survey and gives reproductions of many photographs. The *Birmingham Magazine* is full of interest and beauty, and we wish it a long career.

## COLOUR FACTS AND FALLACIES.

### II.

FROM the pile of Bennetto literature to which we referred a fortnight ago we have had no little difficulty in selecting such materials as may bear directly on the validity or otherwise of that gentleman's extraordinarily extravagant claims; but, if the sifting process has not been so easy as a busy editor could desire, it has brought with it the compensation of a little

genuine amusement. Indeed, if we could afford space to print the whole mass of nonsense penned by the ignorant journalistic and other friends of a great discoverer, who has still to prove that he has made any discovery at all, the extracts, seen by the light of recent developments, could hardly fail to excite pity and laughter in about equal proportions.

Two dates are of first-rate importance when we come to examine Mr. Bennetto's claims. In this JOURNAL of July 31, 1896 (p. 482), we printed the notable announcement that, "after seven years of patient investigation, our townsman, Mr. Wallace Bennetto, of Newquay, has attained what at one time appeared to be an unrealisable dream, viz., photography in colours of nature by *purely* photographic means. The results by this process are . . . , &c. Several leading scientists and distinguished persons have seen the results, and have declared them marvellous. . . . We congratulate Mr. Bennetto on having discovered the long-sought-for Philosopher's Stone of photography. . . . Mr. Bennetto intends to give an exhibition at Newquay before the season is over." We took these sentences from a little Newquay publication, to which for months afterwards Mr. Bennetto and ourselves made copious contributions on the subject of colour photography, and there is consequently no reason to doubt that the quotation represents what Mr. Bennetto said about his process and the claims he made for it.

From July 1896 let us whisk the reader to January 1899. In the first number of our volume for this year we again quote from an interview with Mr. Bennetto, this time with a Plymouth journalist. In that interview, after politely accusing us of misrepresenting his three-colour process in pigmented carbon, which we published from his own description last November, he goes on to say that he could have completely upset every one of our statements, but had decided to adopt another course, viz., to give a lecture and demonstration in Newquay. So far, not only has he not attempted to upset our statements, but the promised demonstration has not been given. Mr. Bennetto is very frequently going to do something which unfortunately invariably stops short of the stage of accomplishment. Finally, in the interview from which we have quoted, Mr. Bennetto makes it clear, after two and a half years' hesitation, that it is by means of three-colour carbon transparencies or prints that he claims to have solved the problem—"what at one time appeared to be an unrealisable dream, viz., photography in colours of nature by *purely* photographic means" (*vide ut supra*). How quaint it sounds to be told that three-coloured carbon prints or transparencies were once, in Mr. Bennetto's ideas, an unrealisable dream, when it stands on record that the process was worked out by Du Hauron in 1869—thirty years ago!

While in this article it is strictly our aim to examine Mr. Bennetto's remarkable claims by the evidence of their accomplishment with which he himself has supplied us, it is, perhaps, convenient that we should give the general reader who merely devotes casual attention to the subject of photography in colours some little idea or definition of the terms "photography in natural colours" and "colour photography" as both or either might be taken to apply to the work of Mr. Bennetto.

Both in these pages and in those of our ALMANAC we have more than once made pointed reference to a lecture given at Oxford, two years ago, on "The Scientific Requirements of Colour Photography," by Captain W. de W. Abney, unquestionably the highest living authority on the subject. In



the very first paragraph of the lecture the distinguished author tells us that colour photography and photography in natural colours are two distinct methods of arriving at the same end, viz., the production of a picture of objects in the same colours as they appear to the eye. Any feasible theory of colour vision lends itself to the success of colour photography, whilst it requires no theory to take a photograph in natural colours.

A glance at these definitions, the philosophy of which it is hardly possible to challenge, tells the reader at once how he may classify the different colour processes that have been brought to notice from time to time. The various three-colour processes in general, and those of F. E. Ives and Du Hauron in particular clearly come under the designation of colour photography, because they rely primarily upon the application of a theory of colour vision for their successful working out; on the other hand, the Lippmann interferential process; the Becquerel experiments on silver chloride; the Carey Lea experiments in the production of coloured photo-salts are direct processes, i.e., they "rely upon the simple act of light," and thus give results in "natural" colouring as distinguished from those which rely upon indirect methods of producing colour in the final results.

Now, it will be apparent from the foregoing that Mr. Bennetto's coloured carbon transparencies or prints are not produced by simple means, that is to say, they are indirectly obtained results, and consequently they are not natural colour photographs. If we may accept Captain Abney as an authority—and we know of none higher—Mr. John Wallace Bennetto's claim to have "attained the unrealisable dream and to have solved the problem of photography in the colours of nature by *purely* (i.e., direct) photographic means" is not worth a moment's consideration. It ought never to have been made; and only an ignoramus would any longer pay the slightest attention to it.

So much for the unfortunate claim to have solved a problem which still defies solution. But we have by no means finished with this claimant's indefensible pretensions. Still adhering to Abney's definition, it is clear that a three-colour carbon process on glass or paper ranks itself as an indirect or colour-photography process whose novelty, at this stage, can hardly extend beyond points of detail; in other words, experimentalists in three-colour work to-day are simply confronted by the minor problems of practice; the "discoverers" were the great masters of theory—Young and Helmholtz, Clerk-Maxwell, König, Abney, &c. Not even Ives, whose three-colour achievements far transcend those of any living photographer, allows himself the title of "discoverer," or makes large claims similar to those with which the name of Mr. Bennetto is associated. As between the latter gentleman and Mr. Ives on questions of three-colour theory and practice it would be cruel to make any comparison.

We have reserved till the last the severest commentary that can possibly be made on Mr. Bennetto's claims, and this issues out of the negative statements which that gentleman uttered about his process nearly three years ago. In one place we are told there is "no colouring, no dyeing, no staining, *all* the colours being obtained by photographic means alone; they were pure and simple natural colours." Again: "Accepting his assurance that no stains, dyes, or pigments are used." Yet again: "He has assured me that no pigment, dyes, or colouring matter of any kind was used." These statements were made by Mr. Bennetto to gentlemen who saw his results, and we have them both in print and in writing!

*No stains; no dyes; no pigments; no colouring matter of any kind!!!* On top of these amazing statements, which we have all along carefully held in reserve, Mr. Bennetto at last publishes details of the process that has "solved the problem," &c. (see this JOURNAL, December 2, 1898). Will it be believed, to quote his own words, that, "In order to produce the positives, I proceed as follows: I first prepare three pigments, a red (such as scarlet or vermillion), a blue (such as cobalt), and a yellow (such as chrome yellow), grinding them very fine and mixing with gelatine or other vehicle. . . . sensitising these bands with bichromate of potash," &c.—carbon printing with coloured pigments, in fact!!

Surely nobody but the veriest dunce, after the absolute destruction of every single one of the very weighty claims Mr. Bennetto has made and entirely failed to sustain, could accuse us of "injustice" towards his "process" (*sic*)! We should hope indeed, for the credit of photographic journalism, that after this exposure none of our contemporaries will allow themselves to be misled any longer in this matter. The Bennetto process has been thoroughly found out at last, and should at once be allowed to join the many other colour fiascos that preceded it.

#### NEGATIVES FOR ENLARGING FROM.

At the last meeting of the Photographic Section of the Croydon Microscopical and Natural History Club, a circulating lecture by Mr. J. H. Gear, on hand-camera work with a view to enlargement, was read. The report of the meeting supplied to us complains of the elementary character of the lecture, and that the main subject, as indicated by the title, was rather lost sight of, "for instance, what kind of negative was most suitable for enlargements, and the class of negative which was unsuitable, pointing out how to obtain the best kind." With reference to the elementary nature of these lectures, the report says: "Of course, if the subject *must* be treated in an elementary way for the benefit of certain members of the societies receiving the lectures, then it seem a reflection on certain other members, who could, and perhaps ought to, render the necessary information to their less experienced brethren. It is like paying some one else to do work that one could do equally well oneself." By the way, these remarks quite sustain others we have heard expressed of the exceedingly elementary and textbook character of some of these circulating lectures, and that they ought to be something more than what the veriest tyro is already familiar with.

Now, the question put in the report—and it is not an unimportant one—as to what is the best negative for enlargements, and what is the most unsuitable, it may be explained, depends very much upon the process by which the enlargement is to be made. This subject brings to mind many queries we have to answer through our Correspondence column. For example, the writers often complain that they are unable to obtain good enlargements from negatives that yield good direct prints. The term "direct prints" often means nothing in this case, for it is, or should be, well known that the kind of negative that is best suited for giving good vigorous prints on albumen paper, platinotype, or the carbon process, is not that best adapted for the gelatine papers, or for developed prints on bromide paper. In the same way the negatives that are the most desirable for enlarging from direct on bromide paper are not the easiest



ones to deal with in making enlarged negatives for platinum or carbon printing. For the former, negatives of a thin or feeble nature are best, and for the latter those of a more vigorous type are desirable. If these latter are used for bromides, there is a general tendency to give hard black-and-white results unless special precautions are taken with the exposure and development. With negatives of the feeble kind there will be a difficulty in getting a brilliant printing negative, though that difficulty may be readily got over by the practised worker.

One of the first essentials, it may be mentioned, in making an enlarged negative for platinum or carbon printing, is a vigorous transparency, and, if the original be feeble and flat, the transparency will partake of a similar character, by whatever process it be made. Therefore, if it be made on a dry plate, the development should be conducted so as to increase the contrasts as much as possible. If the transparency be made by the carbon process—and in some instances this will be the best to employ—it will be well to use a tissue somewhat thin in pigment, such as one of the ordinary portrait tissues, as they give a greater thickness of gelatine in the shadows than the special transparency tissues, and then intensify with permanganate of potash. In developing the enlarged negative, if the transparency still necessitates it, the development should be such as will enhance the contrasts. Now, it will be seen that the negative which is best adapted for one system of enlarging is often just the reverse for another, though, as we have just intimated, both may, with skill, be made available and give good results, although neither is the best adapted for their purpose.

One very desirable characteristic in a negative for enlarging from is that it should be sharp, for it is obvious that, if the original is not sharp, it is impossible to obtain a sharp enlargement from it, whatever may be the system adopted; but with an absolutely sharp negative any desired effect, or degree of unsharpness, may be secured by merely making the enlargement with the lens put more or less out of focus; also with a sharp negative, if it be desired to retain the sharpness at one part and subdue it at another, we can do so simply by using a lens with a somewhat round field—one of the rectilinear type, for example—and working it with its full aperture, focussing upon the portion it is desired to secure with the greatest sharpness.

Here is another point in connexion with negatives for enlarging from that should receive consideration. In hand-camera negatives, on some plates that have been under-exposed and much forced in the development, the image is often very coarse and granular. If such as these be enlarged direct with sharp focussing, the grain with the magnification in the enlargement will be very conspicuous, particularly if the paper upon which it is made is of fine surface and texture. This may, however, be greatly ameliorated by putting the lens very slightly out of focus. This, if judiciously done, will really not materially interfere with the general sharpness of the picture. Granular negatives are, perhaps, best dealt with by the enlarged negative system, because in making the transparency there is, by whatever method, a trifling loss of the finest detail, and so there is in making the enlarged negative from that. These two trifling losses, though not sufficient to mar the general sharpness of the enlarged negatives, render the granularity of the image, if not *nil*, certainly less conspicuous than if it were made, sharply focussed, direct on a smooth bromide paper.

The main object of the present article is to point out that no hard-and-fast line can be laid down as to what type of negative is the best for enlargements without consideration being given as to the method by which they are to be made. One would have surmised, from the title of the lecture above referred to, that these facts would have been pointed out, and thus rendered unnecessary the comments in the report supplied to us of the meeting at which it was read.

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**Silvering and Gilding Glass.**—The production of a silvered surface upon a glass plate or a telescope mirror is an important operation in some branches of photography, and we have given many recipes at various times for compounding the solutions requisite. The method of pouring the solution upon the glass itself is liable, through inclusion of air bells, to lead to the production of flaws and blemishes in what should be a perfect coating. A foreign journal recommends the following method: The sheet of glass to be silvered is placed in a vessel of glass or porcelain somewhat larger than the glass sheet, the opposite edges of the latter resting upon two cross bars of glass or porcelain. The side of the sheet to be silvered is placed face downwards. Then the silvering solution is poured into the vessel until its surface just reaches the lower surface of the glass sheet, which has previously been cleaned with dilute potash solution and rinsed with distilled water. The silver is soon precipitated upon the glass; the longer the contact, the greater the thickness of coating. The coated article is then removed from the solution and rinsed with distilled water and dried at ordinary temperature. The instructions for gilding are the same, the method of making the solution being as follows, and might be with advantage a little fuller. Three solutions are required—one a solution of chloride of gold; the second, caustic soda in distilled water; the third, the reducing solution of starch sugar dissolved in distilled water with alcohol and aldehyde.

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**The Nernst Lamp.**—The old and the new forms of the coming lamp, as previously described by us, were shown at the *Conversazione* of the Royal Society. The new form is a neat arrangement, taking 1.5 watts per candle, which increases to 1.67 watts after about 500 hours, when the consumption of current remains about uniform. When run at 2 watts per candle, a life of upwards of 1700 hours has been obtained, and even then the lamp was not worn out. Some idea of the increased light may be formed when it is said that the temperature at which the filament is worked approaches 3600° C., while 2700 is given as about the limit with the ordinary carbon filaments. It is, however, necessary to bring the lamp to a temperature of 636° C. before it conducts. A resistance of platinum wire is used for the purpose, and as soon as it brings the rare earth filament to the requisite temperature an automatic cut-out, applied by means of a short circuiting device worked by a solenoid, at once takes the platinum out of use.

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**The Cause of the Blue of the Sky and Sunset Colours.**—On the 24th ult. the Right Hon. Lord Rayleigh, F.R.S., gave a discourse upon transparency and opacity at the Royal Institution, which possessed many features of interest to photographers. An abstract is given at some length in last week's *Nature*. It may be said to have been chiefly a consideration of the effects relatively produced when light strikes upon a piece of a transparent body such as glass, and upon the same when reduced to fine or coarse powder. In the latter case it is opaque to light; in the former, as we all know, transparent. If, however, a mixture of benzole and bisulphide of carbon be poured upon the glass powder placed in a flat-sided glass bottle, and the liquid be mixed in such proportion as to have the same refractive index as the glass, the contents of the bottle act as a homogeneous body, and light passes through as though it



were a solid piece of glass. As, however, the two liquids have different dispersive powers, the adjustment of the liquid to glass powder only holds good for one region of the spectrum; for other parts the action is almost the same as the powdered glass itself. Hence, if we look at a small flame backed with a black background, it appears to the eye in its own shape, but strongly coloured. Lord Rayleigh varied the effects in several ways, among them being to use powder from plate glass and liquid cedar-wood oil adjusted with bisulphide of carbon. In this case the free rays, so to speak, extended over a region thirty-four times as large as the separation of the D lines of the spectrum, while with the first-named method (Christiansen's experiment) the region embraced was only equal to 11.3 times. At the close of the lecture the failure of transparency arising from the presence of particles which are small in comparison with light wave-lengths was discussed. The light from an electric lamp was passed through a liquid in which sulphur was slowly being deposited, and the varying amount and kinds of the rays obstructed indicated by the colour of the issuing light the effect of the setting sun. The lecturer also stated his disbelief in the theory that the blue of the sky was owing either wholly or principally to particles of foreign matter. He believed the molecules of air to be capable of dispersing a light not greatly inferior in brightness to that which we receive from the sun.

#### PANAK AND BIRASSOL.

In the *Correspondenz* Dr. E. Valenta reports upon these solutions, which are offered commercially as sensitizers. Panak is brushed upon paper, dried, exposed, and fixed with—

Water.....	100 c. c.
Hypo .....	3 to 5 grammes.
Sulphite of soda .....	1 „ 3 „

The image is dark brown. Analysis shows it to consist of silver, iron, ammonia, nitric acid, organic acids, and sulphuric acid. One hundred parts contain 4.2 parts of silver.

Birassol is a similar preparation, but does not contain any sulphuric acid. There are indications that the brown salt has been used instead of the green ammonio-citrate of iron. Dr. Valenta gives the following formula for the preparation of a similar solution by those interested in the subject:—

#### SOLUTION I.

Green ammonio-citrate of iron.....	2.5 grammes.
Water .....	25 c. c.

#### SOLUTION II.

Nitrate of silver .....	3.5 grammes.
Water .....	15 to 20 c. c.

To Solution II. add ammonia, drop by drop, until the precipitate first formed is redissolved. The excess of ammonia should then be neutralised by carefully adding dilute sulphuric acid until the solution loses all smell of ammonia, whilst yet retaining an alkali reaction. Solutions I. and II. should then be mixed and kept in the dark. The brown ammonio-citrate of iron may be substituted for the green, or ammonio-tartrate of iron may be used, in which case the sulphuric should be replaced by citric acid. The solution then gives brown prints similar to panak. The tartrate gives more vigorous prints, but impairs the keeping quality of the solution. The brightness of the prints is enhanced by addition of gelatine or other suitable viscous substance.

#### PETZVAL'S FIRST PORTRAIT LENS.

Dr. Eder, in the *Photographische Correspondenz*, gives the following particulars concerning this interesting instrument, made in 1841. It has been presented by Ritter von Voigtländer to the Austrian Industrial Museum, Vienna, and photographers will be glad to learn that camera and lens have been preserved intact. The camera is an octagonal cone made of pasteboard with lens fixed at the narrow end, and dark slide with circular opening at the other. A jointed screw is attached to the camera as a means of support. The opening in the dark slide is 97 mm. in diameter. The front combination has a diameter of 39 mm., and the entire lens has an effective aperture of 38 mm. and focus of 15 c. The

following particulars of the elements have been determined by Dr. Rudolf Steinheil. They are given in order, starting with the radius of the front surface of the front lens.

Front Combination	Radius	78.68	Crown (mid. n.=1.528)
	Thickness	7.6	
	Radius	62.45	
	Thickness	1.5	
Back Combination	Radius	653.06	Flint (mid. n.=1.598)
	Separation	51.5	
	Radius	157.96	
	Thickness	1.9	
	Radius	56.01	Flint (mid. n.=1.622)
	Separation	4.2	
	Radius	72.10	
	Thickness	5.3	
	Radius	228.04	Crown (mid. n.=1.546)
	Thickness		

There may be some doubt concerning the refractive indices of the glass, but they appear to be correct, and they show that the front combination consisted of light crown and flint, and the back of heavy crown and flint. Dr. Eder remarks that there can be no doubt that this trial lens had been so carefully calculated that it was found unnecessary to make any subsequent alteration.

#### THE PROJECTED COPYRIGHT BILL.

APPENDED we give such portions of the Copyright Bill now before the House of Lords, together with extracts from the Preliminary Memorandum, as are of interest to the holders of copyright in photographs. The reader is referred to an article on the subject on May 5:—

#### MEMORANDUM.

This Bill is intended to simplify and amend the law relating to copyright in artistic works.

The main features of the Bill are:—

(1.) To secure greater uniformity in the terms and conditions of copyright.

(2.) To reserve to the artist (except as hereinafter mentioned) the copyright until expressly assigned or disposed of by him.

(3.) To make registration of copyright (except as hereinafter mentioned) and of all dealings therewith compulsory.

(4.) To improve the remedies for infringement.

The subjects of copyright are dealt with in three classes:—

(1.) Works of fine art:—(a) Paintings. (b) Drawings. (c) Engravings. (d) Sculpture. (e) Other artistic work (see Definitions, s. 26).

(2.) Photographs.

(3.) Casts from nature.

There are two terms of copyright conferred by the Bill:—

(1.) For an original work of fine art, the life of the author and thirty years after his death.

(2.) For a work of fine art made by one person from the design of another; for a photograph; for a cast from nature; a term lasting until the expiration of thirty years from the first day of the month of registration (see s. 2).

By s. 4 the copyright remains with the author, notwithstanding the sale or disposition by him of the work, until expressly assigned or disposed of by him in writing, or except in case of his bankruptcy (see subsection 2), but (a) where the author is employed for valuable consideration to make a photograph; or (b) to make or assist in making, from the original design of the employer, any work of fine art or cast from nature, the copyright belongs to the employer (see subsection 1), provided that, where the employment is to make any work the subject of copyright, other than a photograph, with the knowledge of the person employed that the work is intended—

(1) for publication (a) as an illustration in a book or newspaper, or (b) as an advertisement, the employer has the sole right of such publication (see subsection 2 (a));

(2) for reproduction as an engraving, or in some other specified form, the employer has the sole right of such reproduction (see subsection 2 (b)).

Subject to the above restrictions, the author's rights remain (see subsection 2 (c)).

Such employer has all the remedies of an author for infringement, and is exempt from registration (see subsection 2 (d)).

With all the above-mentioned safeguards, it is submitted that the reservation of the copyright to the artist should be conceded.

With regard to registration:—

Under s. 16 (1), the author and his executors or administrators need not register so long as the copyright remains in him or them, but, on the copyright passing from him or them, registration is necessary. Under s. 1, however, authors of works first made in the United States of America must register.

Under s. 4 (2) (d), an employer to whom the copyright passes in the



cases provided for in subsection 2 (a) and (b) need not register, and under s. 5 owners of portraits are likewise exempt.

Subject as above, registration is compulsory (*see* s. 16 (1)), and must be effected within six months from the date when the person who is bound to register became entitled, power being given to the Court to extend the time for registration (*see* s. 16 (2)). Failure to register voids the interest which should have been registered (*see* s. 16 (3)). Registration, where compulsory, is a condition precedent to proceedings for infringement (*see* s. 18).

The remedies for infringement and the provisions for repressing the commission of fraud under the existing law are amended and strengthened, and, in addition, is given (a) power to search for and seize unlawful copies in houses and shops; (b) power to seize unlawful copies on hawkers.

These powers were recommended in the Copyright Commission Report of 1878 (*see* paragraphs 173-180).

With reference to Part IV. of the Bill, it should be noticed that by the definition of "copy" (*see* s. 26) every form of copying is intended to be protected, including the reproduction of a picture by sculpture, of a sculpture by any other work of art, and a representation of a picture or sculpture by a living picture (*see* Copyright Commission Report, paragraph 99, and *Hanfstaengl v. Empire Palace* (1894) 3 Ch. 109, and (1895) Appeal Cases 20).

#### A BILL INTITLED AN ACT TO SIMPLIFY AND AMEND THE LAW RELATING TO COPYRIGHT IN ARTISTIC WORKS.

##### Part I.—Nature and Duration of Right.

1. The author, being a British subject, of any work of fine art, photograph, or cast from nature, made after the passing of this Act in any country whatsoever, and the author of any work of fine art, photograph, or cast from nature, made after the passing of this Act in any part of the British islands, or, in the case of any work of fine art, photograph, or cast from nature, first made in the United States of America, registered at Stationers' Hall within three months after its registration in the United States of America, shall have throughout the British dominions copyright as defined in this Act.

2. The copyright conferred by this Act shall, subject to the provisions of this Act, endure for the following terms:—(a) In the case of an original work of fine art, for the life of the author and thirty years after his death; (b) In the case of a work of fine art, made by one person from the design of another, of a cast from nature, and of a photograph, for a term commencing on the completion of such work of fine art, cast from nature, or photograph, and continuing until the expiration of thirty years from the first day of the month in which the same shall have been registered.

4. (1) If any person employs another for valuable consideration to make any photograph, or to make or assist in making from the original design of the employer any work of fine art, or cast from nature, the copyright in such work shall belong to the employer as if he were the author of such work, cast, or photograph.

(2) Except as above provided, the copyright in any work the subject of this Act shall remain in the author, whether such work be sold or disposed of by such author or not, unless the copyright therein be expressly assigned or disposed of in writing by him, or except in the case of his bankruptcy; provided that—(a) Where any person employs another for valuable consideration to make any work the subject of copyright under this Act, other than a photograph, with the knowledge of the person employed that such work is intended by the employer for publication as an illustration in a book or newspaper, or as an advertisement, the employer shall, during the subsistence of copyright in such work, have the sole right of publishing the same as an illustration in a book or newspaper, or as an advertisement, or in any of such forms, but not otherwise. (b) Where any person employs another for valuable consideration to make any work the subject of copyright under this Act, other than a photograph, with the knowledge of the person employed that such work is intended by the employer for reproduction as an engraving, or in some other specified form, the employer shall during the subsistence of copyright in such work have the sole right of reproducing the same as an engraving, or in the specified form, but not otherwise. (c) Neither the author nor his assigns shall publish or reproduce such work in any form of reproduction, the sole right to which has been conferred upon the employer by subsection (a) or (b) hereof. (d) Such employer shall have all the rights and remedies of an owner of copyright under this Act to prevent and obtain damages for infringement of his rights under subsections (a), (b), and (c), and to obtain seizure of copies dealt with in breach thereof, and such employer may maintain an action or other proceeding in respect of his said rights, although neither the copyright in the work in question nor the interest of such employer therein is registered under this Act.

##### Part II.—Infringements and Remedies.

6.—(1.) If any person shall infringe copyright in any work the subject of this Act, by committing any act the exclusive right to do which is, by this Act, reserved to the owner of the copyright in such work, without the consent in writing of such owner or of his agent thereto authorised in

writing, such person shall be liable: (a) to an action for an injunction to restrain such act, and for damages, and for an account of all copies unlawfully dealt with by him; (b) to penalties of an amount to be fixed by the jury hearing the case, or, if there is no jury, by the Judge, not exceeding 20*l.* for each copy unlawfully dealt with, together with twice the price at which such copy shall have been sold or offered for sale, and the costs of the proceedings to be taxed as between solicitor and client; providing that an action for penalties shall not lie against any person who commits, or causes to be committed, any of the acts specified in subsections (b), (c), and (d) of the definition of copyright in this Act contained, and who proves to the satisfaction of the court hearing the case that he had no reasonable ground to suspect that such acts were infringements of any copyright, to the forfeiture and destruction of all unlawful copies, and of any plates, blocks, negatives, moulds, or other similar things, from which such copies were or may be produced, in his possession or control.

(2.) The above remedies shall be cumulative, except that the amount awarded in penalties may be considered in assessing damages, and the amount awarded in damages in assessing penalties.

##### Part III.—Registration.

16.—(1.) So long as the copyright in an original work of fine art remains the property of its author, his executors or administrators, no registration thereof shall be necessary; but, if such copyright or any interest therein shall pass to any person other than the author, his executors or administrators, it shall be compulsory upon such person to register his interest in such copyright. Save as above excepted, registration of copyright in a work the subject of this Act, or of any interest therein, shall be compulsory upon the owner of such copyright or interest.

(2.) Where registration of the copyright in any work or of any interest therein is compulsory under this Act, it shall be effected within six months from the date when the person who is bound to register became entitled to such copyright or interest, or within such further time as the High Court, or a Judge thereof, shall, with or without imposing terms on the applicant, think fit to allow.

(3.) In default of such registration of any copyright under this Act within the time herein provided, such copyright shall become null and void, and, in default of such registration of any partial interest or license relating to such copyright, such interest or license shall determine, but without prejudice in the case of a license to the rights of the author or duly registered owner of such copyright.

17.—(1.) There shall be kept at the Hall of the Stationers' Company, by the officer appointed by the said Company for the purposes of the Copyright Act, 1842, a book entitled *The Register of Owners of Copyright in Works of Art*, wherein shall be entered, except as hereinbefore provided, a memorandum of every copyright to which any person shall be entitled under this Act, and also of every subsequent assignment of or license relating to such copyright.

(2.) Any assignment or license so entered shall be effectual in law without being subject to any stamp or duty, and shall be of the same force and effect as if such assignment had been made by deed.

(3.) Applications for registration, and the entries in the register made thereon, shall be in the forms and contain the particulars set out in the first schedule hereto, with such modifications as the Stationers' Company may from time to time prescribe.

18.—Except in the case of proceedings by the author of an original work of fine art in respect of infringements of his copyright therein, no action shall be sustainable, or any penalty recoverable, in respect of anything done before registration.

Provided that, where any person entitled to copyright under this Act registers such copyright within the period provided by this Act, such registration shall have effect for the purpose of proceedings against infringements as if it had been made on the day on which he became entitled to such copyright.

19.—(1.) The officer appointed by the Stationers' Company shall have power, upon written application being made to him by the registered owner of the copyright in any work the subject of copyright under this Act, and, on his being satisfied of the existence of any inaccuracy in the registration of such work, to make any correction in the name or place of abode or business of the author, publisher, or owner of the copyright of any such work, or in any other matter, as stated in the register, on payment of a fee of 1*s.* for each entry so corrected.

(2.) If the plaintiff in any proceedings for infringement of copyright was registered as owner of such copyright before the infringement complained of, no inaccuracy in the manner or form of such registration or particulars stated therein shall be a defence to any such proceedings, unless the tribunal before which such proceedings are taken is of opinion that such inaccuracy reasonably misled the defendant in such proceedings.

20.—(1.) The Stationers' Company shall in respect of the book of registry kept by them under this Act make and keep an index for each year, showing in alphabetical order the name of every owner or licensee of copyright registered under this Act, with the date of his registration and the reference to the book of registry in which the particulars of registration may be found.



(2.) The said Company shall also, in respect of all works registered under this Act, make and keep an index for each year, showing in alphabetical order the names of the authors thereof, with the title or short description of each work, and the reference to the place in the book of registry where the entry relating to such work may be found.

*Part IV.—Supplementary Provisions and Definitions.*

23.—(1.) The copyright subsisting in any work of fine art, photograph, or cast from nature, by virtue of any enactment in force immediately before the commencement of this Act, shall endure for the term limited by that Act, or for the term fixed by this Act with respect to such works first produced after the commencement of this Act, whichever is the longer.

In this Act, unless the context otherwise requires—

The expression "work of fine art" shall mean a painting, drawing, engraving, or sculpture, or other artistic work.

The expression "engraving" shall mean any work, executed upon any material, whence by any process, whether immediately or mediately, prints may be taken and multiplied indefinitely, other than a photograph, and shall also include any prints so taken.

The expression "photograph" shall include the photographic negative or positive, and any prints or copies made therefrom.

The expression "original work of fine art" shall mean a work of fine art made by a person from, or according to, his own original design.

The expression "copy" shall, subject to the provisions of this Act, mean any representation or reproduction of a work or any part thereof, or the design thereof, in the same or in any other form, and in any material, and in any size, and shall include a reproduction of a picture by a sculpture, or a sculpture by any other work of art, and a representation of a picture or sculpture by a living picture.

**PRACTICAL NOTES ON SOME IRON PRINTING PROCESSES.**

*Part III.—BLUE LINES ON WHITE GROUND.*

*Pellet's Process. Positive Cyanotype.*

The foundations of this process were worked out by Herschel about 1840–2, i.e., about the same time that he introduced the negative cyanotype or ferro-prussiate process (q.v.).

In 1863 Baudesson and Houzeau (of Rheims) employed tartrate or citrate of iron for coating paper, and developed it with ferrocyanide of potassium.

In 1877 Pellet suggested the addition of some such colloid as gum. Gelatine, dextrine, &c., have been tried, but gum arabic seems the general favourite.

*The Paper.*—This should be of a firm, non-absorbent, and well-sized kind. It may be sized with gelatine or arrowroot. For an arrowroot mixture take 5 parts arrowroot and add 100 parts water, and boil slowly until a clear starch-like fluid results.

The following formulae for coating the paper are all highly recommended:—

1. Citric acid .....	40 grains.
Iron perchloride .....	48 "
Gum arabic .....	42 "
Water .....	11 ounces.

2. Oxalic acid .....	5 parts.
Iron perchloride .....	10 "
Gum .....	9 "
Water .....	100 "

A.	
3. Gum arabic .....	8 parts.
Water .....	40 "

B.	
Ammonio-citrate of iron .....	8 parts.
Water .....	16 "

C.	
Ferric chloride .....	5 parts.
Water .....	10 "

Add B to A, with constant stirring; then add C. At first the mixture is rather thick, but, if kept in the dark for a few days, it becomes thin enough for coating purposes.

A.	
4. Gum arabic .....	170 grammes.
Water .....	600 c. c.

B.	
Tartaric acid .....	40 grammes.
Water .....	100 c. c.

Add B to A, slowly stirring all the time. When thoroughly mixed, add 110 c.c. of a solution of iron perchloride, which indicates 45° on Beaumé's

hydrometer. This is practically a fully saturated solution of the iron salt. This mixture is well stirred and kept twenty-four hours in the dark. When required for coating, it is diluted with pure water until it indicates 14° to 15° on Beaumé.

5. Indian ink of a creamy consistency can be added to the coating mixture. The resulting picture is thus made black rather than blue, i.e., a blue-black image is obtained.

Another strongly recommended formula is—

A.	
6. Gum arabic .....	1 ounce.
Water .....	5 ounces.

B.	
Ammonio-citrate of iron .....	1 ounce.
Water .....	2 ounces.

C.	
Iron perchloride .....	1 ounce.
Water .....	2 ounces.

Mix in the following order: Take 10 parts of A; to this add, with constant shaking, 4 parts of B; and, finally, 3 parts of C.

7. The following formula, without any colloid, is also worth a trial, but it must only be used on a very thoroughly sized paper. It possesses the advantage that it is easier to spread and get an even coating.

Oxalic acid .....	5 parts.
Ferric chloride .....	10 "
Water .....	100 "

*The Coating* should be applied with a fairly stiff flat brush, and made even by crossing and recrossing the brush strokes. It should be dried as quickly as possible, i.e., by the heat from a stove, &c., and stored in a dry and dark place. If properly stored, the paper keeps in working order for a very long time. If, after keeping, the paper is found to be working in an unsatisfactory way, it should be immersed in clear cold water for two to three minutes, and then quickly dried. It will now print more slowly.

*Printing.*—This should be in a good light, i.e., strong diffused light, or in the direct rays of the sun if the heat is not excessive. The time for strong direct sun may be about half a minute to a minute. For diffused light the time will probably be four to ten times as long.

*Exposure* is best estimated by employing a small similar negative, under which is placed two or three small strips of paper. These are withdrawn from time to time, and developed on a twenty per cent. solution of potassium ferrocyanide, i.e., yellow prussiate. If, after floating the strip for a minute, you see that the lines are clear and strong blue, and the background yellow, the exposure is sufficient. Over-exposure gives faint lines, patchy and weak. If the ground is stained blue, it indicates under-exposure. The image is visible when sufficiently printed, but only shows very slightly. Test slips should therefore be used until experience is gained.

*Developing and Clearing.*—For these operations three dishes are required. One contains cold water; a second has a solution of potassium ferrocyanide, of strength 20 parts of the salt to 100 parts of water. The exact proportions are not of great importance. The third dish contains either dilute hydrochloric or sulphuric acid of strength 1 to 2 parts strong acid and 100 parts water. To develop a print, first lay it face down on the table, and turn up a strip about half an inch wide all the way round. Now lay it face down floating on the potassium ferrocyanide. In a minute or so examine it. The image should now show a violet-blue on a yellow-green background. If not sufficiently out, it may be returned to the developing bath, or held in the hand a few seconds. When sufficiently developed, immerse in the clean water, keeping it moving for a short time to get rid of the potassium ferrocyanide solution. Next, transfer it to the acid clearing bath, when the print should come a bright Prussian blue colour. It is again well washed and hung up to dry.

*Varnishing.*—It is advisable at times to varnish such prints as maps, plans, diagrams. This may be done as in ferro-prussiate prints, with Canada balsam in turpentine, or thin dammar varnish.

*Corrections* may be made by applying the following solution locally:—

Caustic potash .....	1 part.
Oxalic acid .....	1 "
Water .....	10 parts.

Or a five per cent. solution of potassium oxalate may be used.

Application of the fluid should be made with a quill pen or small brush, and care used to see that it does not run. To prevent spreading action, a little gum arabic may be added.

**SUNDRY NOTES.**

*Ferric Chloride* is the same thing as iron perchloride. It is a deliquescent substance, i.e., attracting moisture, and should, when first bought, be a dry, hard, rather pale yellow colour. On exposure to air, it



crumbles, darkens, and gets sticky. A saturated solution is like treacle, and measures about 45° on Beaumé's hydrometer.

*Potassium Ferrocyanide* is the yellow prussiate of potash of the oil shop.

*Stains on the Fingers* may be removed by a dilute solution of caustic potash, but as this is apt to remove the skin also, care must be used not to employ too strong a solution. As soon as the stain is removed, rinse the fingers well with warm water, and apply a trace of oil for a minute or two, and wash off with soap.

REV. F. C. LAMBERT.

### ART FOR PHOTOGRAPHERS.

At the monthly meeting of the Blairgowrie and District Photographic Association on Tuesday evening an admirable paper on "Art for Photographers," by Mr. A. Geekie (President), was, in his unavoidable absence, read by Mr. J. B. Maclean. The writer stated that the study of the human figure included all the finest principles of the art, and when the eye of the student had been accustomed to see faithfully all the minute circumstances which constitute the character of a figure, and to attend to the innumerable beauties and graceful forms which it presents, he would be better qualified to proceed with advantage to every other branch of the fine arts. In the conception of a picture, he pointed out that there must be a principal object which should receive the principal mass of light, and though a second or third group might be added, and a second or third mass of light, they should all be kept so subordinate that they would not come into competition with the principal. In our endeavours to obtain a pretty picture we forget the different values which were required, and if we knew how to balance one object by another, or understood how each ray of light brought about its corresponding value in shadow, considerable time would be saved and better work done. Simplicity was of the first importance in the design or composition of a picture. The story should be distinctly told, and nothing should be introduced but what was absolutely necessary.

The one great point of simplicity was that it prevented confusion; it gave to each figure or object its position; there was no stepping out of place or jumbling together, as was too often seen in photographs where simplicity had been overlooked. This feature bore directly on photography in various ways: first, in the subject itself; secondly, in the use of backgrounds; thirdly, in the quality of light and shade; and, further still, in the arrangement of light and shadow. The old-fashioned photograph invariably suffered from the hardness of tone as well as exaggeration in the lights and shadows, and generally failed to do more than remotely suggest what it attempted to represent; even now, many of the photographs representing living persons were so stiff and uninteresting as to leave much to be desired. He advised a study of works by famous artists, who, however, should not be servilely followed; the photographer should rather endeavour to imbue himself with their spirit. In conclusion, he said expression was the very soul of art; a picture without expression was nothing.

### FRAMES AND MOUNTS.

THERE was a large attendance at the Croydon Camera Club on Wednesday evening, the 17th inst., to hear "A Chat about Frames and Mounts," by the President, Mr. Hector Maclean.

Mr. Maclean prefaced his lecture by apologising for the "scrappy" nature of his remarks, due to the fact that of late he had had numerous and unexpected calls upon his time; but the ease and comprehension with which he handled his subject made apology quite unnecessary. He began by adverting to the theory that a frame should, to some extent, resemble a hole in the wall or an archway, and pointed out how that the interest and beauty of a landscape are greatly enhanced when framed, as it were, by these means. The frame of a picture should perform a similar office by focussing the eye and concentrating attention upon the print. Frames have been regarded from two points of view, *i.e.*, as decorative objects or as aids to setting off and improving pictures. The first use which might be made of them would not interest his audience, because the more decorative the frame the less effective it would be in improving the picture enclosed. One fundamental maxim regarding frames as aids to pictures is that they should be, almost without exception, inconspicuous and subordinate, and, in the case of photographs the extremes of both high light and darkness in the frame should always be less than in the print. Glitter, vivid patterns, and bright colouring are all harmful, as are strong light or full dark tones. This was illustrated by a reference to the framing of a snow scene, which, being full of half-tone and gradation beautifully rendered, was most unfortunately framed in black and burnished silver, which flattened the whole thing and detracted greatly from its beauty. It was pointed out that, as regards exhibitions, the frame should be calculated to isolate the subject from the other competing prints. In this connexion Mr. Maclean gave his hearers the benefit of his knowledge with regard to the modifications necessary in framing for exhibition as against framing for the drawing-room. He recommended that prints framed for exhibition should be examined first in diffused outdoor light, and explained by analogy of the lantern slide

the differences of effect produced by gallery lighting and ordinary room lighting. As to mounting with a margin or framing close, this really gives rise to no question, as the mount should be considered as part of the frame, and the proper frame is that in which the picture looks best. The best style of frame is often asked for. It is, however, impossible to formulate any universal system, although this would seem to be contradicted by the gift of the Royal Academy. The lecturer pointed out that this was only a choice of evils, and was rendered necessary on account of the clashing which would ensue were framing left to individual taste. Fashion and novelty in framing should not be wholly neglected. Mouldings and materials offer a wide range, and this should be noticed, although, if the prevailing fashion is unsuitable, it is, of course, not permissible. The proportion and shape of a frame are regulated by the picture. Many hold that the only shape for a picture is that of a rectangle in which one side has a ratio to the other of about 3 to 2 or 4 to 3; but it must have been noticed how often a square, circle, or an oval, was the best, if not the only, shape for some compositions. Tone was next dealt with, and the influence which could be exercised by its means would, said the lecturer, sometimes amount to making a success or a failure. The colour of a frame was not less important than its tone. It should never be unpleasant in itself, nor too attractive to the eye, nor raw, primary, or vivid in colour, such as scarlet, cobalt, emerald green, &c., and the nearer its approximation to these the worse is the result. The result of the colour of a frame will be either a harmony, a contrast, or a discord. The latter effect was, of course, only mentioned to be condemned. The modifications to be got by the two former effects in capable hands were lucidly pointed out at some length, and, in conclusion, Mr. Maclean dealt with the subject in a practical way, giving his experience regarding wood and stains.

Mr. Packham, who moved a vote of thanks, and eulogised the able manner in which Mr. Maclean handled his subject, treated his fellow-members to some valuable hints as to the study of colour harmony, and went on to give them the benefit of his experience in wood-working and staining.

Messrs. Slater, Costa, and J. Smith gave recipes for staining; and the City Frame Company contributed several striking prints surrounded in the most approved Salonique solemnity. Upon separating, the members congratulated themselves upon having spent a pleasant and instructive evening.

### FLOWER PHOTOGRAPHY.

At the meeting of the Photographic Club, on May 17, Mr. Thomas Bedding in the chair, the Chairman announced the death of one of the Club's honorary members in the person of Mr. W. B. Bolton, at one time a regular attendant at the meetings of the Club, a body of which he was one of the original founders. Mr. Bolton's life work in the photographic cause was briefly alluded to, and a vote of condolence with his widow in her loss was passed and ordered to be communicated to her.

Mr. H. T. Malby, F.R.P.S., read his Affiliation lecture on "Flower Photography," in which, in a manner calculated to render the best of help to those possessing but the scantiest of knowledge with the special features of this fascinating branch of work, are given the full fruits of the author's thoroughly practical acquaintance therewith. A valuable feature of the paper was the series of slides, many of which compared the possibilities of ordinary and orthochromatic plates with and without colour filters, which, in view of the variety of tints in flower subjects, is a matter of the first importance.

Mr. J. H. Baldock passed to Mr. Malby some of his own work in flower photography, many being taken necessarily in the close confines of a hot-house, where there was little scope for pictorial treatment or arrangement. It was his custom to give a generous exposure, and to develop with a pyro developer, half a grain to the ounce. The lighting was modified by drawing down screens over the housetop, and he particularly wished to know what were the most suitable backgrounds for the work.

Mr. Malby replied that a background of distempred calico had served him very well, and the lighting could be regulated to an extent by means of mats on the roof. The difficulties of working in a hot-house were sometimes exceedingly great, the high temperature and humid atmosphere having before now caused his apparatus to swell and the slides to lock. He preferred pyro for development, but at a vigorous strength, say, two grains per ounce.

Mr. E. Dockree raised the question of size of image in relation to size of original, a question which has been much discussed. Some said that a flower photograph was of no value unless it represented the actual dimensions of the flower, and some of his own work on a reduced scale was the recipient of expressions of opinion to this end. He said there were two sides to the question of flower photography, the purely pictorial and the scientific sides, in pursuing the latter of which he had often given as much as three hours' exposure in order to secure certain essential details of the flower. The matter of background and of suitable colours, therefore, was a difficult one, to which he was still devoting much attention. He referred to the difficulties in the way of photographing certain plants and flowers. The maidenhair fern, for instance, could not be photographed quickly enough to get the detail in the petals, on account



of its continual motion. Certain flowers were still in the shade, but, let a ray of light fall upon them, they immediately become animated.

Mr. Malby replied to these and other points, adding that the colour screens he employed were the original Ilford screens, the pale yellow practically necessitating an exposure of three times the normal, and the dark yellow six times.

Mr. Baldock said he had used a greenish-yellow screen made of chromate of potash, approximating, as Mr. Malby remarked, to the Burchett screens.

#### EXHIBITIONS: TECHNICAL AND OTHERWISE.

[Paper read before the London and Provincial Photographic Association.]

We hear a great deal nowadays about the need for paying more attention in our exhibitions to the technical side of photography. I am going to ask you to-night to bear with me for a little time while we look into this cry, see what it means, inquire whether there is any substantial basis for it, and, if so, how the demand could best be met.

And in the first place, what is meant by the technical side of photography? This seems a simple question to answer, and yet I have heard very few satisfactory explanations of the phrase, as far as an exhibition is concerned. Some people appear to mean examples of good, clean photography, carefully purged from any trace or hint of the pictorial. They profess to desire an exhibition in which an appreciable proportion of the wall space shall be covered by examples of correctly exposed, properly developed, glossily enamelled silver prints, free from all trace of double tones, depicting such things presumably as semi-detached villas, boots of various makes, machinery, interiors of chapels, jars of pickles, groups of footballers, wheelbarrows, prize turnips, and professional beauties. With the single (or married) exception of the last, who are perennially and universally interesting, I ask you how many photographers would go to see such a show? How many members of the great British public would visit it? An exhibition to which no one would go fails to be an exhibition at all. The mere hanging of frames on a wall, and charging for admission to see them, is hardly an exhibition.

The "exhibitees" form an essential feature to my way of thinking. Hence the importance which was rightly attached to the huge total of visitors to the justly celebrated Bradford Exhibition recently. When I went there I found quite fifty people in the gallery, mostly elderly men and children, the former quietly sleeping on the seats thoughtfully provided by the Committee, the latter playing about. I myself, with a morbid desire for singularity, went round and looked at the pictures. Admission was free, so the good people of Bradford poured into their exhibition. It was raining outside at the time.

Visitors, then, are an essential feature of an exhibition, and the kind of technical exhibition I have just referred to would, I am sure you will agree, fall short in this particular. This is one of the ways in which it is supposed an exhibition may "cater for the technical side."

Another explanation of this mysterious want is given. We are told that more attention should be given to the technical side of pictorial photographs. I confess that this might, in a few instances, be done, but surely not in our big exhibitions. To take the case of the Salon and Royal Exhibitions, I cannot recall, amongst the leading pictures in both, going back for several years, any signs that their producers were bad technicians. I ask you, does anybody this side of Hanwell think that, because to get certain effects their pictures have been thrown out of focus, printed through silk or celluloid, allowed to pass although showing signs of movement, Messrs. Craig Annan, Berghelm, Cembrano, Crooke, Davison, Emerson, Hinton, and Sinclair, to name offhand just a few whose work shows some of these peculiarities—I say does any one suggest that any of these workers could not produce what we should here be satisfied to regard as a technically perfect photograph?

I should like to see every picture in every exhibition submitted to a jury of photographers, not focus maniacs, but sensible men—members of the London and Provincial let us say—with instructions to reject every print which bore upon it signs of technical imperfections, and that greatest of all technical defects, *handwork*. Let it be an instruction to them to throw out all double-toned prints, all Chinese-whited prints, all prints trimmed apparently with the teeth, all those spotty and showing signs of halation. None of the recognised leaders of pictorial photography would suffer, except, perhaps, those who disguise good photography with varnish and paint. We should lose no print that we could not well spare, but a few misguided beginners, who have accidentally produced one print, into which those who know far more than they can read intentions and aims that never existed, would receive at the outset of their careers a reminder that they must learn to walk before they run, and we should be spared the spectacle of a high place being given to the accidental result of one who never again made a presentable photograph, and such things have been.

I do not for one moment believe that any photograph would be rejected by such jury which the exhibition would not be stronger without; I do not consider that one really stupid composition, one result of the earnest work of an earnest worker, would be excluded. I do believe that it would mean a very great saving of time and trouble to the jury of

picture-makers who should be asked subsequently to decide which should be hung, or which should be medalled.

In this sense, no doubt, there is room in a good many exhibitions for paying more attention to the technical side of photography.

There is another definition of a technical exhibition, which would refer to one containing specimens of various processes, new and old. As far as these are concerned, there may be room occasionally for some such a show. It entails a great deal of trouble in getting together, and to be of any real use at all an immense amount of labour in cataloguing. Such a show we had last year at the Crystal Palace. It was the most complete of its kind I have ever seen, and probably you will agree with me in this. It was furnished with a catalogue giving the interesting points of each exhibit, the processes were classed together, and, thinking the matter over now in the light of my experience gained on that occasion, I do not know of any great improvements which could be made were another being organized. Small changes for the better in various directions, no doubt, would be beneficial; but I can recall no important example of an instance where it might be made more complete or available.

What was the result of this collection as an exhibition? It was very rarely out of the thousands interested in photography that any one was seen in those sections, and then only because they had lost their way into them, an incident which the general arrangements of the Palace did much to facilitate, and were anxiously trying to get out.

It is, in my mind, a moot point whether from the point of view of an advantage to the public such a show is really worth the trouble and expense it necessarily involves, except perhaps at long intervals.

New processes may be exhibited, and in this direction there is a clear field for the technical side of an exhibition, but this is a very limited one. There are those who complain of the technical side of the Pall Mall Exhibition as inadequate. Its accommodation is poor, no doubt, and I think might be greatly improved with advantage. I do not think, however, that we must look for any very extended exhibition in the shape of results by new processes unless the number of these undergoes a considerable increase. Run your minds back over the last twelve months, and think whether you could cover, say, the walls of this room with specimens by methods new within that time, which should be of interest as such, and not merely as pictures. It can be done when the ground covered is five years or ten years, but one year is too short to give a decided enough advance to make an interesting show annually.

Another direction in which an exhibition may be technical is found in the display of apparatus and material, and herein lies, to my thinking, the one direction in which a good show may be made every year. The present system in vogue at Pall Mall of excluding everything not decidedly novel would not do at all, and it would have to be left to the dealers and manufacturers themselves to decide what they should put in and what they should omit. Every user of a camera, whether a picture-maker, a technical worker, or a plate-spoiler, is interested in cameras, developers, plates, and so on, and would like, I have no doubt, to see under one roof all the varied makes and patterns. Here, then, is room for a truly technical exhibition, and this is the direction in which I think a successful one is most probable.

Having dealt then with what this demand means, the next question to decide is whether there is any basis for it. The real persons to bear the brunt of such a show (I am presuming it is supposed to be an annual one) will be the manufacturers and dealers. If it is to be organized, it is to them that we shall look for the guarantee against financial loss. It may (it probably would) be carried out without any great margin either of profit or loss, but the guarantee would have to come from the trade; they would have to pay the piper, and theirs, then, is the privilege of calling the tune. Have they done so? Has there been, not any determined and organized demand; but, to put it at the lowest, have there been even spasmodic cries for such a show from the trade? I for one have not heard them; have any of you?

No. The outcry has been raised in quite a different quarter. Each year we have two exhibitions—the Salon and the Royal—two essentially picture shows, competing, as we all know them to compete, for the same kind of work—the pictorial. It may suit certain partisans of one or the other to suggest that they are not competitors, that they fill different fields, and that they should continue to do so. But we who see them both know perfectly well that they are keen rivals in the same field; that the highest type of pictorial photograph, the cream of the year's work in artistic photography, the finest show of photographic pictures in fact, is what both aim at. We may hear that the one encourages the fuzzy, the other the sharp, school, but no one really heeds these things.

If we take the finest work of the year, it does not go to one because the other does not appreciate it, but because the other does not get it. I am very far indeed from deprecating this rivalry. As one whose sympathies (prejudices if you will) incline him strongly towards the side of the older exhibition in Pall Mall, I can yet heartily wish well to the Salon. I am sure that the feeling is shared by all who are interested in the R.P.S. We should look upon the failure of the Salon or the breaking up of the Linked Ring as a calamity. There is ample room for both, and they have a stimulating and beneficial effect upon each other. There are, however, one or two turbulent spirits in both camps. In the Salon they cry for



the Royal to pay more attention to the technical side because they fear its competition in the pictorial.

When it suited their purpose they denounced the Society on the ground that it gave no attention to the pictorial side, but was *purely technical*. There has been no marked change in the scope or aims of the Society's exhibition since then, yet now we hear nothing but the opposite complaint. Both cannot have a basis of fact. One or other must be wrong. In my opinion (prejudiced, if you like) both are.

The outcry of the same nature in the Society's ranks proceeds from slightly different causes. Partly, I think, from a fear of competing with the Salon on the present ground, although, the closer the aims of both resemble each other and the keener the competition, the better for both; mainly, I think the idea that the exhibitions should be more technical is based on Lord Crawford's kindly and admirably expressed wish to do something to help the "bread and butter" photographer. In his desire I am sure he will have the sympathy of all of us, the only question is how such help can best be given.

I do not think a class or room reserved for professionals' work would be of much use. I may be wrong, but it seems very questionable what amount of assistance in money or reputation a photographer, say, in Plymouth or Carlisle, is to get from having two or three specimens of his work hung at an exhibition in London.

If we take the very highest class of portraiture, work such as that produced by Messrs. Crooke or Baker, for example, it forces its way by sheer merit into any exhibition already. If the standard is to be lowered—because that is really what it would come to—if the standard is to be lowered until the work of any average professional is admitted, the exhibition would suffer. I have no wish to decry the average professional work; it is what the public demand, and, if better were turned out, they would not appreciate it. The cultivated people, the people who can value at its true worth the work of such men as I have named, is a very small one, and the general run of professional photographers know their business far too well to send out prints which are over the heads of their customers.

The more I think of this side of the question, the more difficult it becomes to see clearly the best way out of it. One would think, from the huge interests now engaged, that photography should be able to maintain an annual exhibition, bearing the same proportion to the photographic trade that the cycle shows do to their own industry. And yet, in view of the fact that the trade do not demand it, there seems little hope of it ever realising.

The most probable, or, at any rate, the most prominent, outcome would be if the Royal Photographic Society were to take such a gallery as the New Gallery—a proposition which I am revealing no secrets when I say is actually under consideration—and organize an Exhibition there on as broad lines as possible. To do this effectively, the lion's share of the space would have to go to the pictorial section. It is the side which interests the largest number of photographers, and which certainly is the most attractive to the general public. The floor area might well be devoted to the trade if the manufacturers and dealers were agreeable. A room—a small one would suffice—could be reserved for specimens of new processes or things of similar interest, and, finally, an exhibition of professional work, if it could be managed, might be included. Whatever happens, the photograph which has no merit beyond that of good technique should be most certainly excluded. The manufacturers have made bad technique inexcusable.

That, gentlemen, is my view of the ideal exhibition of the future, one which is both technical and otherwise.

R. CHILD BATLEY.

### THE WEHNELT INTERRUPTER FOR X-RAY WORK.

SINCE the introduction of the focus tube, we have had no startling advance in X-ray apparatus, or in the methods of procedure. The discovery, by Dr. Wehnelt, of the Electrolytic Interrupter is one of the greatest importance, and it not only marks an epoch in the history of the X rays, but it will in all probability bring about an entire change in the construction of both coils and tubes. For some time investigators have been engaged in the construction of contact-breakers, for producing rapid interruptions, with the intention of getting rid of the obnoxious and irritating flickering of the tubes. The Wehnelt interrupter has done this, and more, for not only are the tubes worked through it as steady as an ordinary incandescent light, but the efficiency of the coil is increased nearly fifty per cent., whilst the condensers and contact-breakers are rendered useless and unnecessary.

The interrupter itself is an exceedingly simple piece of apparatus, and can be made by any one possessed of a small amount of technical skill; but for its use it is necessary that an electric-supply current be available, otherwise it is expensive and difficult to manage, as at least fifty volts are required to work it. The apparatus (fig. 1) consists of a glass jar, beaker, or small accumulator tank (A) containing a solution of dilute sulphuric acid (about ten per cent.); in this are suspended a cathode pole, (B), consisting of a sheet of lead about six inches square, and an anode, which is made by fusing a short length of platinum wire into the end of a curved glass tube (C), which is filled with mercury to make a perfect contact. A piece of the platinum wire, varying from a quarter to an

eighth of an inch in length, projects through the closed end of the glass tube (D), into the acid solution. These electrodes may be suspended through holes in a wooden cover made to fit the jar, or, better still, from wooden strips (E), which rest upon its edges. In another form the lead plate (which may be circular in shape) may rest upon the bottom of the beaker, whilst it is connected with the binding screw on the cover by a narrow strip of the same metal, the platinum-pointed glass tube being suspended above it (fig. 2). This form of apparatus has not in my

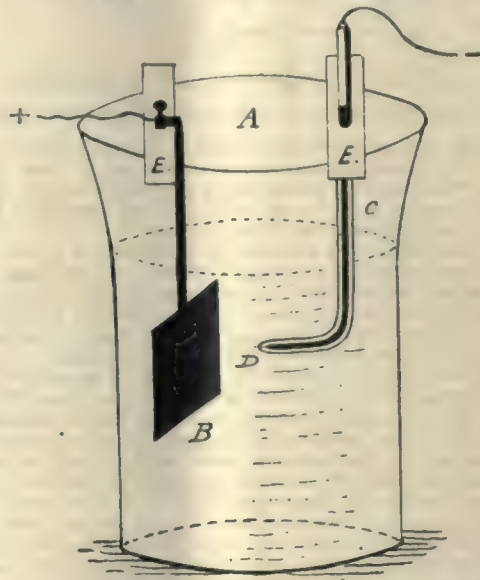


FIG. 1.

hands been so successful as the first, on account of the liability of the glass tube to crack owing to the heat generated by the platinum wire when the apparatus is at work. In the first-mentioned form of apparatus the heated water rises to the surface without touching the glass, whilst in the second the glass tube receives the whole of it. The cracking of the tubes may also be avoided by drawing them to a point, instead of fusing the platinum wire into a thick and rounded end.

In regulating the instrument, the distance between the platinum wire and the lead plate is not a matter of so much importance as the size and

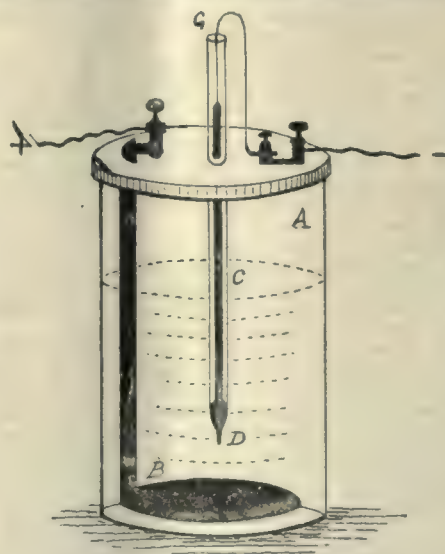


FIG. 2.

length of the platinum wire which is allowed to project from the end of the tube. The wire should be about 20 B. W. G., and a quarter of an inch should be allowed to project. If this is found to allow too much current to pass, it can be easily shortened.

In working the interrupter from the 100 or 110 volt current supplied to most large towns, a resistance must be used which is capable of reducing the supply to from eight to ten amperes. This resistance should be adjustable, so that anything between this amount named and the full current can be put on at will.

In connecting up the apparatus with the coil, it must be remembered



that neither the condenser nor contact-breaker is required, so that these must both be cut out of circuit. In most coils this is easily done by connecting with the binding screws which supply the primary coil; in some, however, it is necessary to rearrange the instrument before it can be used with safety. In starting work all the resistance should be used, when, if your platinum wire is not too large, a large violet brush or a rush of sparks should pass between your sparkers, which, by the bye, with a six-inch coil should not be placed more than four inches apart. On lessening the resistance (which must be done very gradually) the stream of sparks will coalesce into one of the ordinary bright colour, and, on still reducing it, this will give way to a continuous flame of a violet-red colour; beyond this point it is dangerous to proceed.

The noise made by this rapid passing of sparks is difficult to describe, as it is almost deafening, and it increases as the resistance is reduced, until with the violet-red flame above mentioned a high-pitched musical note is produced, showing that between 800 and 1500 interruptions are taking place in a second.

In attaching X-ray tubes to the coil thus worked, the greatest possible care must be exercised, as the platinum anti-cathode can be completely melted in under half a minute. Having chosen a good tube and connected it up, it will be noticed that it glows with a steadiness approaching that of an ordinary incandescent lamp, and that with the screen no flickering is to be observed. During working, the tube must be carefully watched, and immediately the anti-cathode becomes red hot the current must be switched off, otherwise it may reach the melting point before steps can be taken to avoid it. The tubes at the present time are not made to withstand the great heat generated by the electrolytic interrupter, and considerable modifications will have to be made in them before they can be used with perfect safety. The platinum will certainly have to be thicker than that generally used, and it will have to be backed with a large piece of metal to help in radiating the heat.

The electrolytic action of the interrupter absorbs a large amount of the electric energy passed through it, so that, by carefully adjusting the distance between the platinum point and the lead plate, and by still more carefully measuring the length and size of the platinum point itself, it is quite possible to work any coil from the electric-light mains without putting any resistance in circuit. As, however, these adjustments can only be made by repeated experiment, and as it is an advantage to be able to increase the amount of current, I should advise a rheostat being used in all cases. There is a great advantage in this, inasmuch as, with a rheostat in circuit, a platinum point can be used which is capable of carrying more current than is actually required; this the rheostat reduces to a workable amount, and if the vacuum of the tube should become higher, and more current be required, the rheostat can be easily adjusted, when otherwise the troublesome process of placing in the interrupter a larger platinum point would be necessary.

With a good large rheostat in circuit there is little danger in working any fairly large-sized and well-made coil with the electrolytic interrupter; without a rheostat, however, advice should be taken before the novice attempts to experiment.

What, it may be asked, are the advantages of the new interrupter? Cumbersome condensers and costly contact-breakers are unnecessary; the efficiency of coils is greatly increased; the flickering of X-ray tubes is overcome, and the time of exposure necessary for producing radiographs is reduced to less than a fifth of that previously resorted to.

A well-built coil, capable under ordinary circumstances of giving a six-inch spark, will, with the electrolytic interrupter properly adjusted, give a continuous stream of sparks nine inches in length, and a coil which was previously perfectly useless for X-ray work will, under the new condition of things, work an X-ray tube to perfection.

I have not experimented with the new interrupter for a sufficient length of time to be in a position to state with certainty exactly what it will or will not do. However, in using it with my nominal 12" spark coils, with which I previously used an improved platinum contact-breaker, I find the difference in the exposures necessary to produce a good negative upon the "Castle" plate (which I always use) to be as follows:—

#### With Contact-breaker. Electrolytic Interrupter.

Hand	... ..	from 40 to 60 secs.	... ..	from 5 to 9 secs.
Arm	... ..	" 60 to 120 "	... ..	" 10 to 20 "
Thigh and knee	... ..	" 3 to 8 mins.	... ..	" 60 to 130 "
Chest	... ..	" 5 to 15 "	... ..	" 1 to 2 mins.
Pelvis	... ..	" 8 to 15 "	... ..	" 1 to 2½ "

These exposures have, of course, been made with tubes specially made for the old methods of working, no others at present being obtainable. It is more than probable, however, that much more suitable tubes will shortly be constructed, when we may look for still greater advances.

The likely alterations which will, in all probability, be made in coils to be worked by the Wehnelt interrupter, it is not my intention to dwell upon. I shall, however, have more to say upon this point later on.

That the Wehnelt interrupter has placed increased power in the hands of all radiographers, there can be no gainsaying. How far this increased power will take us cannot be answered until we have become better acquainted with it.

J. HALL-EDWARDS, L.R.C.P., F.R.P.S.,  
Surgical Radiographer to the General Hospital,  
Birmingham.

May, 1899.

## PHOTOGRAPHY BY PLAN.

THE ordinary photographer looking over his negatives must be struck by their variety of subject: woodland scenes, water bits, country inns, cottages, a church or two possibly, and, if married, his wife and children, collectively and individually. He asks himself, after going through, whether he has had his time and money's worth in pleasure out of them. Yes, he readily admits that he has, but yet thinks he would have had fuller value had there been more negatives of a certain kind. These, in his opinion the best, will turn out to be those taken along the sunny congenial paths of his own particular liking; the ones that express his individuality. There is no necessity for dilating upon the higher pleasure that following one's particular bent gives over a random wandering, nor upon the increased value of result. Added value not merely to the worker himself, but to his fellow-workers and friends generally, for if a man's heart be in what he is doing it shows itself quickly and markedly enough in the quality of the finished product. The evil of it is that individuality is not given fair play. There is not a consistent admission of it as the most important factor in the prospective arranging, nor the actual carrying out, of work. High worth is shown only too often in scraps; a fine bit of material stitched here and there into a patchwork quilt, very different from the artistic and symmetrical design in a carefully woven whole.

Returning to our supposititious critic and his negatives, he may find, for instance, that he thinks most of his landscapes. He should devote himself, at least mainly, to landscapes, but also, and here lies the gist of the contention, form a definite plan to the systematic gaining of a representative series of landscapes. By doing so the pleasures of photography would be immensely heightened to him. The aim might be at gaining his object, say, geographically, county by county; or more broadly by taking natural distinctions of soil, rainfall, and so on, as divisions. Beyond the interest in the individual picture, a far wider one will soon be generated in comparing and contrasting, the flat corn-lands of one district with the undulating pastures of another; the wooded coombes of Devon with bare Yorkshire moors; steep, rugged Welsh mountain-sides with the long easy grades of Cheshire. Water scenes, winding stretches of river, quiet pools, rippled or brawling brooks, may appeal more to another; the ample spaces of the sea, sandy reaches, and contour of coast to a third. But let each picture dovetail in to the forming of a symmetrical whole. Such a whole to a thoughtful mind may gradually and unconsciously lead not only to a truer idea of the topography of one's country, but through it to the logical deduction of the why and wherefore of its past history and present features. The salient actions of old-time warriors and leaders, that led to a fight here, the establishment of a garrison there, the building of an abbey somewhere else, were not hap-hazard ones, but as carefully thought out from a point of favourable position as the more prosaic building of a soap factory, or the laying down of an iron foundry are nowadays. A river had high strategic value, and its spanning by a bridge always made local, oftentimes national, history. One would imagine that, apart from the artistic side, this wider way of looking at bridges would make a photographic collection of them most valuable, suggestive, and interesting. The same applies more markedly still to roads; or the two could be readily combined, their use and purpose lying so closely together. Various types of houses, again, readily lend themselves to similar photographic purpose: stately ducal mansions set in parks, comfortable manors and farm-houses in rich meadow-land, cottages in gardens, rural inns, churches, scraps of village streets, and sleepy county towns. And, to introduce the all-important human element, how much more readily through these can the life and doings of their past and present dwellers and users be built up and truly realised. Where is there a photographic record of British sports? or, if one be more seriously inclined, of British workers and their varied working places? What of different kinds of carts, horses, dogs, boats, and so on in a hundred different directions, in every-day use in different parts of the country? Here is surely ample material for any number of plans, and, instead of being the *dilettante* hobby it only too frequently is, would not photography be immensely lifted in helping to form such items into well-defined wholes?

All very well for a man of leisure and means, but how is it to apply to one short of either, or both? Many may be short of them in the ampler measure necessary for carrying out a very wide plan, but not so, I take it, for a smaller one, or they could not have bought a camera and taken to photography. Let a small plan be made; but, if small, let it be a complete one; the pleasure lies in working to a known finish. The house must be built complete; and although, to carry out the comforting analogy, a large house undoubtedly gains from its size, there is no reason why a smaller one may not be made very proportionate and pleasing, and succeed in filling up the heart of its possessor every bit as fully as the larger one does that of its wealthier owner. It is astonishing, too, how opportunities can be made to gain a much-desired end. Most people, for instance, have no particular reason for taking a summer holiday in a particular place or district; here, as affording the opportunity of adding a brick or two to the structure building, it is supplied them—and a something to boot, to help the passing of the tediousness of leisure unaccustomed to, so often mis-called holiday enjoyment.

Even if a man be really and rigidly bound down to one spot; have no holidays; cannot, strive as he may, give sufficient time to a scheme that



will take him in any way afield—we are not going to give him up. Such fast ties will probably mean that he is married, and, married, fonder of, and more interested in, his wife and children than anything else. Let his scheme be a record of his children from babyhood onwards. With it he may after all be a happier man than his freer brother. The picture of young wife and first baby takes a lot of beating—to the husband and father. A backyard and a suitable camera will be all that are needed for the record, from the catching of characteristic flashes of childish play and earnest, through boyhood, or maidenhood, up to the wedding-group if you like. Like old wine, these negatives, too, get more valuable with keeping; in the quiet of declining life they will have become priceless. When the account of college honour, or, later, of the ampler one of practical life has reached home, what value, pray, would be put by the happy father or mother upon the photographic record of the boy, lovingly looked through and musingly lingered over? And all with the prime essential touch of the personal equation about it; done by one's self. A pity we do not recognise it more fully in pictures of our children. We send them in their stiff, unsuitable best to be posed—fancy posing a child—by a stranger, and bargain for the result at so much a dozen! Small wonder they look such conscious little popinjays set in their plush and bastard art, something and a half-penny, frames! No one can truly photograph a child except his father or mother, and that at home.

But to leave this particular side of our argument; if unduly lengthened out, let love of children bear the brunt of the fault. Enough, I trust, has been said upon the main idea of forming a complete photographic record of an agreeable and interesting something, and being led through it to a general broadening of thought and interest, to induce some adoption of it. The one who does try it will not readily let it drop when the great comfort is experienced of working in the clear light of a definite aim, in place of half-hearted wandering from one thing to another. He will know what to take, and will take it with a set purpose. Better still, he will know what not to take; be one of the few at a picnic or convention outing without a camera, and all the happier for it. JOHN REES.

#### X RAY WORK AND LANDSCAPE ART AT THE CAMERA CLUB.

On Monday, the 14th instant, Dr. Mackenzie Davidson brought before the members of the Club some remarkable advances which he has made in X-ray work for surgical purposes—advances which, it is not too much to say, will mark a new era in the history of operative surgery. At the outset the lecturer explained that his work was chiefly in connexion with hospital practice, and that photography was but the handmaid of his labours; but he proved at an early stage of his remarks that he was a very competent worker with photographic materials.

He divided his discourse, after the manner common in old-fashioned sermons, into three heads; otherwise his lecture was certainly not sermon-like. First he dealt with the Crookes' tube; second, with the localisation of a foreign body in the human organism; and, third, with the production of radiographs for use in the stereoscope.

When he commenced X-ray investigations, he found a great difference in the various Crookes' tubes which he came across, and noticed that some gave remarkably fine definition, whilst others were most deficient in that respect. This led him to carry out a series of experiments in order to find out in what manner this distinct delineation, which is so necessary in surgical work, could be secured, and he was fortunate enough to obtain the services of a good glass worker, in the person of Mr. Cosser, who made various tubes for the carrying out of these experiments. After describing, by means of a diagram, how the cathode rays in a Crookes' tube are brought to a point in front of the anode where the X-rays are generated, the lecturer had a tube made with a movable anode, and finally, by testing this, he was able to fix upon a length between anode and cathode which gave the best possible definition. The methods adopted in the course of this difficult investigation were fully described, the definition being tested on a fluorescent screen by means of a cross-barred frame.

Working the Crookes' tubes at their utmost capacity by giving them all the current that they would bear, he found that the anode became white hot and quickly perished. Finally, he obtained the best results by using an anode of the rare metal, osmium, which he was not able to solder, but held between plates of aluminium. He also tried osmium held between platinum plates, and rivetted thereto to prevent it falling out. Another set of interesting experiments was with a view to control the current from the induction coil by the use of the spark gap, and the ingenious method by which he secured X-ray records of these experiments was much admired. As a result of all his trials, he decided upon one form of tube which gave admirable definition. It was not so lasting as the common form of commercial Crookes' tube, but the perfection of the results it gave more than compensated for its short life.

And now the lecturer came to his second head—Localisation.

When the X-rays were first experimented with, surgeons were so delighted at getting pictures of hidden structures that they did not realise that there was a necessity for localisation if the X-rays were to be of much use to them. For example, suppose that a needle is buried in a person's hand. When the member is submitted to scrutiny by the X-rays, the needle will appear upon the resulting photographic negative

as a perfectly defined white line, much whiter than the bones of the structure, because metal is far more opaque to the Röntgen rays than are the bones. But no one can say from looking at the picture whether that needle is buried in the palm or surface, or in the back of the hand. And in attempting to remove the foreign body the surgeon would, if he judged the needle to be at the back while it was in front, or *vice versa*, subject the patient to much cutting about, which would be, to say the least, extremely unpleasant. The matter would be vastly more serious in the case of a bullet wound in some deeply seated structure of the body.

By the apparatus which Dr. Davidson has contrived the operator is able to exactly localise the precise position of any foreign body in the flesh of which the X-rays can form an image. In the first place the Crookes' tube is so fixed upon a stand above the operating table that it can be moved laterally a distance of, say, three inches. A radiograph of the subject is taken first with the tube in one position, and then another is taken with the tube moved to its other place, three inches away. The result is two images of the bullet, or whatever may be the nature of the foreign body, on the plate, together with the images of two wires at right angles to one another, which are used as guides. Knowing the exact distance of the tube from the photographic plate, and with the help of these images, it becomes a simple matter to calculate the exact position above that plate of the foreign body which the surgeon wishes to remove.

But the most remarkable part of Dr. Davidson's achievement remains to be described. He has more particularly directed his attention to the detection of foreign bodies in the eye. Such accidents are far more common than most persons would suppose, and at our hospitals workmen are constantly presenting themselves with a chip of metal which, glancing from the lathe or chisel, has struck and buried itself in the eye. A foreign body will often remain in a limb throughout life, and will give no trouble at all, but with the eye it is very different—it must be removed, or the eye must be removed; if allowed to remain, the other eye will probably be affected by sympathy with the injured organ, and blindness of both eyes results. Hence the great importance of a method of detecting the exact position of one of these dangerous fragments, which may be almost too small for the unaided vision to appreciate. That the method which Dr. Davidson has invented and adopted is effective is evident from the fact that up to the present time it has been used effectually in no fewer than a hundred cases in the various London hospitals.

The patient sits while under examination by this method, and his head is, so to speak, wedged into one position, so that it remains perfectly rigid. Behind him, against the eye to be examined, is the photographic plate, held vertically in a frame, and in front the Crookes' tube upon its movable stand. A tiny metal wire, secured on the eyelid by a piece of adhesive plaster, gives the necessary base line from which the exact position of any foreign body in the eyeball can be subsequently calculated.

Instead of taking the two images of a foreign body on one plate, the lecturer prefers to use a separate plate for each, and this plan has the advantage that the two pictures can afterwards be employed for use in the stereoscope. Various paired pictures of this kind were dispersed about the Club room, and members had an opportunity of closely examining them. The form of spectroscope employed was the primitive form of Wheatstone's, with the angled mirror. The lecturer concluded his remarks by a description of the new electrolytic break for the induction coil, which is so effective for X-ray work, but which, alas! is rather destructive to the tubes employed.

Dr. Mackenzie-Davidson's paper was much appreciated, and was followed by a brief discussion, in which Mr. Inwards (the Chairman), Professor McHardy, and others took part.

On the following Thursday—the last night of the present session—Mr. Alfred East, Associate of the Royal Academy, gave one of his charming discourses upon art—that is, the art of the landscape painter. The ordinary camera man is apt to fight shy of these discussions upon the art side of photography, but Mr. Alfred East found a large audience awaiting him, and a brother of the brush in the person of Mr. Storey to act the part of chairman in his usual genial manner.

First, then, came a word of good-humoured introduction of the lecturer from Mr. Storey, who told the audience that his own place in the assembly was merely to keep order and prevent any fighting. They all regarded Mr. East in the light of an ally rather than as an opponent, and he felt sure that they would learn that evening much that would be of use to them as photographers.

Mr. East said that there were many technical difficulties in the art of painting which did not assail that of the photographer, but they all met upon one common ground in their love of art. Nature was not perfect by any means, and it was the art of the painter to select from the wealth of subject offered to him that which would suit his purpose or the purpose of his picture. This was comparatively easy for the painter, but a difficult matter for the photographer. Still, the photographer can often exercise a considerable amount of choice in this matter of selection. Thus he can decide in his picture upon the proportion of earth to sky, and earth to foliage. He should approach Nature in a spirit of receptivity, and should endeavour to get all from Nature which appealed to him as an individual, so that people should afterwards recognise in his work something distinctive in his methods.



With regard to the all-important matter of selection, we should first of all consider the worthiness of the subject which we propose to transfer to canvas or plate—does it contain those elements which will illustrate our emotions? There is a great deal of personality in the matter, and each artist will select that which appeals to him most.

Next there is the important question of the amount of lights and darks in a picture, and the contours of those lights and darks. If these contours are agreeable, that is a long step towards a satisfactory picture.

Mr. East next dealt with the different methods adopted by well-known painters, and especially dealt with the colour schemes of Turner, and pointed out that it was the practice of that great painter to have a counter-point to each colour employed. It might be a figure, perhaps ill-drawn, but giving the point of colour required at the right place. Of course, a photographer could not deal with colour, but it was in his power to obtain contrast by the introduction of figures in an intelligent manner.

A few useful notes followed upon the cutting down of pictures; it was shown how sometimes a composition will gain in apparent size by being in reality reduced. Thus, in the case of a mountain scene with a redundant sky, the mountain will appear much higher if a strip of sky be sacrificed to the pruning knife.

Contrasts of colour for the painter were compared with contrasts of form for the photographer. We are all the victims of inherited convention, and this governs our handwork to a remarkable degree. We frankly accept certain conventions of form and construction as being correct, and this was strongly apparent in the landscape work of artists previous to the time of Constable. It was universal then for foliage, for example, to be painted in a set conventional manner which to-day is horrible to contemplate. Constable changed all this, representing things as he saw and felt them, and painters who followed him happily did the same. Photographers would do well to emulate the same spirit of independence. In this way they would get many followers, and perhaps touch many hearts.

Lastly, Mr. East said a few words about artistic photography, and, in approaching this part of his subject, expressed the hope that he would not tread upon any one's toes. He had a respect for sharply focussed work for certain subjects, and, going to the other extreme, he pointed out how dangerous was the "fudging," or faking, of a negative, so as to obtain a universal blur upon the resulting picture. A tree had a trunk, which was hard in outline, while it had softly defined foliage; by blurring all its parts, its character is obviously destroyed. Some things we might blur, and give the idea of life, and he had seen some marvellous photographic results obtained in this way, but he must confess that they were not always satisfactory. Whatever is done must be done with a view to preserve the character of the thing dealt with.

In many moving subjects, such as the flight of a bird and the gallop of a horse, the points of "extension and recover" were the only paintable incidents. A photograph would show the intermediate attitudes, and such pictures were most useful as studies. He would recommend photographers to study Turner's *Liber Studiorum*, as well as Claude's *Liber Veritatis*, for both books gave valuable lessons in composition. Let them try to invest all their work with the idea of life and movement, which were the predominant and most beautiful characteristics of good art.

The discussion which followed Mr. East's paper was not a very satisfactory one. He happened to give passing notice, by way of illustration, to a certain picture with a moon in it, and, by some strange conceit, the discussion ignored all the best features of the paper, which really bristled with controversial matter, and seized upon this wretched moon as a peg upon which to hang endless harangues. Member after member arose to talk about the apparent size of the moon when at the zenith or on the horizon, until a stranger might have thought that he was in a lunatic asylum rather than a healthy club. When, at length, the talkers had done with the moon, the discussion came to an end, and all joined in a hearty vote of thanks to the accomplished lecturer.

## Our Editorial Table.

### STARS AND TELESCOPES. A HANDY BOOK OF ASTRONOMY.

Founded on the Ninth Edition of Lynne's *Celestial Motions*. By DAVID P. TODD, M.A., Ph.D., Professor of Astronomy and Director of the Observatory, Amherst College, author of *A New Astronomy*, &c. With maps and 219 illustrations. 12mo. Cloth, gilt top, 2 dols.

Little, Brown, & Co., 254, Washington-street, Boston.

PROFESSOR TODD's new work, *Stars and Telescopes*, is practically a compendium of astronomy in all its branches. It gives full and accurate information on all important phenomena of the heavens, and makes use in this of the latest discoveries. There are chapters on "The Calendar," "The Astronomical Relations of Light," and "Solar Physics;" also one on "The Cosmogony," giving Professor See's new theory of cosmic evolution. Besides these and other more familiar discussions, the book contains the story of the great telescopes, and the progress effected by them, together with sketches of noted astronomers; and the reader who

desires to go to original sources will find these indicated in bibliographic lists, which follow each chapter. The illustrations are very numerous, and, being as varied as the text, have great interest. In view of the wide field covered, this book will prove, it is believed, a model of completeness and scholarly statement. The enormous part which photography has played in astronomical progress during recent years is fully set forth, and the book, as a source of reference, is simply invaluable. In minuteness of detail it is remarkably complete, and we have not for a long time had through our hands such a painstaking production.

### THE YEAR BOOK OF PHOTOGRAPHY AND AMATEUR'S GUIDE FOR 1899.

Edited by E. J. WALL, F.R.P.S. 660 pp. Price 1s.

London: Published at 9, Cecil-court, W.C.

THE annual of our contemporary, the *Photographic News*, appears at a time of year when an amateur's interest in photography is thoroughly reawakened. Mr. Wall has so cast his volume that it appeals to a very large class indeed. His own introductory article is on the subject of "Practical Instructions for Enlarging," in which a great deal of useful information is given in terse and direct language. Following this article there is a lengthy review of enlarging apparatus, and papers and formulae, so that all possible information is crystallised round the main subject. Other articles are: "Architectural Photography," by C. H. Oakden, a tried expert in this branch; and "Shutters," by E. H. Birney. About 100 pages are devoted to the Photographer's Gazetteer, a very useful feature indeed for the tourist photographer. Mr. Hepworth gives an article on "Practical Hints for Lanternists," and there are many formulae, illustrations and reviews of apparatus, so making the *Year Book* a thoroughly serviceable amateur's guide.

### THE PLATINOTYPE PROCESS.

By W. J. WARREN.

London: Iliffe, Sons, & Sturmer, 3, St. Bride-street. 89 pp. Price 1s.

MR. WARREN's addition to the literature of platinotype printing is a simply worded exposition of the principles and practice of this most popular process. It is just the kind of book to place in the hands of the beginner, in the reasonable certainty that such a one will find no difficulty in understanding it. The author is on safer ground here than when dealing with a less exact method of "printing," such as gum-bichromate, which has been killed by ridicule, and the details, practical hints, and personal experiences that he gives are sure to be appreciated, coming as they do from a very able photographer indeed. The frontispieces show imitation specimen platinotypes before and after development.

### CATALOGUE RECEIVED.

Edinburgh: A. H. Baird, 37, Lothian-street.

MR. BAIRD's catalogue aims at including "everything photographic," and a glance through its ninety odd well-illustrated pages shows that mention has been given to most of the requirements of the modern photographer. The catalogue is well produced, and is handy for reference.

WE have also received the *Tourist's Vade-mecum of Spanish Colloquial Conversation*, published by Sir Isaac Pitman & Sons, Limited, of No. 1, Amen-corner, E.C. Two or three pages are devoted to photographic questions, and the pronunciation of the Spanish equivalent is given in each case.

## News and Notes.

MR. JOHN A. HICKS, trade enlarger, has removed from No. 291 to No. 355, New Cross-road, London, S.E.

PHOTOGRAPHIC CLUB.—May 31, at eight o'clock. "Demonstration of X-Rays with Fluorescent Screens up to Date," by Mr. J. R. Gutz.

MR. D. L. EVANS, dispensing chemist, 27, Walter-road, Swansea, has had built a very commodious dark room for the free use of amateurs and tourists.

MESSRS. DAVID BURNETT & Co. sold at the Mart last week the freehold of No. 54, Cheapside, in the occupation of the London Stereoscopic Company, for 28,500l. This price is equivalent to 60l. per foot super. in possession.

THE BAY STATE PHOTO CO., of 124, Hospital-street, Nantwich, write: In answer to your correspondent, A. W. Andree, for the address of S. Wing, the patentee of ferrotype apparatus, I enclose it: S. Wing & Co., 100, Cambridge-street, Charlestown, Boston, Mass., U.S.A.

AN interesting work is promised in a few days by Messrs. Horace Marshall. It is entitled *Mr. Pickwick's Kent: A Photographic Record of the Tour of the Corresponding Society of the Pickwick Club in Rochester, Chatham, Dingley Dell, Muggleton, Cobham, and Gravesend*. The author, Mr. Hammond Hall, gives some hitherto unpublished Pickwickiana, and the work is illustrated chiefly by photographs specially taken by Mr. Lionel Gowing.



**BRITISH EXHIBITS AT THE PARIS EXHIBITION.**—The Royal Commission for the Paris Exhibition have issued their first list of exhibitors to whom space has been allotted in the British Section. In the groups of manufactures and various industries the British firms number 500, and are thoroughly representative. It is made compulsory for exhibitors to place prices on their goods in French equivalents. The competition for space has been so keen that the various committees of the Royal Commission experienced great difficulty in making their selections, and, owing to the limited space, out of some 2000 applications more than half had to be refused.

**THE STORAGE OF CARBIDE OF CALCIUM.**—At the Reigate County Bench, on Saturday, Mr. F. C. Morrison, on behalf of the Reigate Rural District Council, made application for a warrant empowering Mr. Talbot Kyle, the County Inspector, to search the premises of Mr. Wells, Green Farm, Smallfields, Burrow, under the Petroleum Acts. Mr. Kyle, he said, had every reason to believe that Mr. Wells had larger quantities of carbide of calcium stored on his premises than were authorised under the Act. In reply to Mr. Kyle, Mr. Wells had written saying that he had a stock of calcium of carbide for his own use. The legal quantity allowed to be stored was five pounds. Mr. Kyle, on being sworn, said he had reasonable grounds for believing that a larger quantity than was allowed was being stored by Mr. Wells. The application was granted.

**WHAT'S IN A NAME?**—At Colchester Bankruptcy Court last week, before the Deputy Registrar (Mr. Joseph Lee), Thomas York Morter, photographer, &c., carrying on business as "T. & E. Morter," in Queen-street, Colchester, attended for his adjourned public examination. In reply to the Official receiver (Mr. Messent), the debtor said he traded as "T. & E. Morter" with the object of turning the business over to his two sons, Thomas and Ernest. His wife's initial was "E." but she had never taken any part in the business, and was not indicated by the "E." He commenced business as "Thos. Morter," but Mr. Kavanagh, in whose employ he was at that time, objected, and he then altered it to "T. & E." Mr. Sichel, a creditor, also examined the debtor upon the same point, and observed that the debtor was now applying for fresh credit as "E. Morter." The bankrupt said it was his wife who wished to start business now, and Mr. Asher Prior, appearing for the debtor, intimated that it was merely an application for goods on the hire-purchase system. The examination was closed.

In a communication to the *Lancet*, Drs. S. Stephenson and D. Walsh say: "From time to time sensational reports have been published as to the effects of the Röntgen rays upon various defective conditions of the eye. It was asserted, for instance, that cases of blindness had been relieved by the aid of the focus tube. In the hands of competent observers, however, the results of similar experiments have proved negative. The fallacy of the original observations may have lain in the fact that they dealt with cases of hysterical blindness—that is to say, with patients who might profess themselves cured under any novel plan of treatment. Or, again, the blindness may have been due to opacity of the cornea, or of the lens, whereby ordinary light would be excluded, but no resistance would be offered by the opaque tissues to the passage of the Röntgen rays. A reference to some of the early literature on the subject shows that none of the alleged cases stand the test of critical examination. It has lately been claimed that the retine of colour-blind persons were acted upon strongly by the Röntgen rays. In order to test this assertion, four colour-blind children were subjected to the rays emitted from an ordinary bicond focal tube attached to a twelve-inch coil working at nine inches. The children were two of them aged eight years, one nine years, and the fourth eleven years, and of good intelligence. Their colour sense was defective in red-green, and their form sense was normal. Perception of light and form proved normal when tested by the screen enclosed in a bellows fluoroscope. When the children looked steadily at the brilliantly lighted tube, they showed no signs of photophobia. They all recognised objects, such as keys, when held against the bare tube or against the screen. The after-phosphorescence of the tube was seen by all of them, as well as the greater intensity of the area in front of the anti-cathodal plane. Lastly, there was no sensation of light when the eyes were shut and bandaged, and the children put in front of the 'live' tube at the level of the eyes. To sum up, there was no reason to suppose that the retine of these four colour-blind children reacted to the focus tube in any way differently from those of folk with normal colour sense."

## Patent News.

The following applications for Patents were made between May 8 and May 13, 1899:—

**ANIMATED PHOTOGRAPHY.**—No. 9783. "Apparatus for Taking and Displaying Photographs of Moving Objects." M. BARR.

**CAMERAS.**—No. 9874. "Improvements in Photographic Cameras of the Reflex Type." A. J. E. HILL and PHOTO, LIMITED.

**SHUTTERS.**—No. 9884. "Improvements in or relating to Focal Plane and other Roller-blind Shutters for Photographic Purposes." A. L. ADAMS.

**CAMERAS.**—No. 9895. "Improvements in or relating to Photographic Cameras." T. K. BARNARD and F. GOWENLOCK.

**DISHES.**—No. 9920. "An Improved Dish for Washing Photographic Prints." R. ST. C. HOUGH.

**ANIMATED PHOTOGRAPHY.**—No. 9954. "Improved Apparatus for Displaying Animated or Zoetrope Pictures." E. CADETT, A. G. MACCULLOCH, and H. DICKINSON.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
29.....	Bradford Photo. Society .....	Miscellaneous Evening.
30.....	Birmingham Photo. Society ..	Members' Lantern Evening: Series of slides illustrating Gwydyr Castle. R. Haines.
30.....	Hackney.....	Suitable Printing Processes. J. A. Sinclair.
30.....	Lale of Thanet .....	Annual Excursion.
31.....	Photographic Club .....	Demonstration: X Rays with Fluorescent Screens—up to Date. J. R. Gotz.
June.		Discussion on Subjects of Photographic Interest. Exhibition of Pictures taken on Easter Excursion to the Wyke Valley.
1.....	Liverpool Amateur.....	A Chat on Stereoscopic Photography. J. E. Hodd.
1.....	London and Provincial .....	Excursion: Knott Hill and District. Leader, W. C. Brown.
3.....	Ashton-under-Lyne.....	Excursion: Waltham Cross and Abbey. Leader, S. H. Kemble.
3.....	Borough Polytechnic .....	Excursion: Zoological Gardens. Leader, G. Guest.
3.....	Hackney .....	Excursion: Turton Tower. Leader, T. Burton.
3.....	Oldham .....	

### ROYAL PHOTOGRAPHIC SOCIETY.

MAY 23,—Technical Meeting.—Mr. J. J. Vezey in the chair.

#### KOREA.

A large audience, which included a considerable number of ladies, assembled to hear a lecture by Mrs. ISABELLA BISHOP, the well-known traveller and explorer, on "Korea," a country which has lately been much talked about, but of which very little is generally known. Korea is about the same size as Great Britain, with a population of about seventeen millions, a country of mountains and valleys, with no plains, a splendid climate, and a sufficient rainfall, but it has practically put up the notice, "Travellers will have their throats cut," an unpleasant possibility which did not deter Mrs. Bishop from paying four visits between 1894 and 1898, spending six months on two journeys in the far interior, and six months on two visits to Seoul, the capital. Its history began in 1122 B.C., when it was conquered by a rebellious Chinese general, who imposed upon it an alien civilisation, which has lasted unimpaired to this day, laws, religion, and social and political order remaining quite Chinese. Up to 1876 the seclusion of the country was maintained, the only people who had succeeded in getting into it being some Jesuit missionaries, who must have been very successful in making converts, for in 1896 the present King's father destroyed, at a place three miles from the capital, nineteen bishops and priests, and 2000 Korean converts. In 1876 a commercial treaty was entered into between Korea and Japan, but the Japanese were confined to a few miles of country round the port of Fu-san, and failed to trade there, or anywhere else, and in 1884 other treaties were formed, including one with England. Seoul (the capital) is twenty-five miles inland, and, as there are no roads in Korea and no wheeled vehicles, travelling is very difficult. The city is magnificently situated upon a hill, and is surrounded by a wall fourteen miles round and forty feet high, running up and down hills, descending into valleys, crenulated, and with eight very fine gate towers. It is a city of wig-wams, a dead level of thatched roofs, sheltering over 250,000 people. Throughout the day the streets are crowded with men, women being abroad, but at eight o'clock each evening a great bell sounded, and then until midnight the women folk may come out, no man being allowed out of doors within those hours, except blind men and those having business at the druggists' shops. Mrs. Bishop dryly remarks that blindness was apparently very prevalent and that a great many prescriptions had to be made up. This ordinance, however, is very strictly enforced on the women, for many of them told Mrs. Bishop that they had never seen the outside of their own houses by daylight, and the Queen said that, although she had twice accompanied the King on Royal processions, she had never seen more than two streets of the capital. The King was described as a man of a thoroughly bad type, with no sense of justice, no truthfulness, no honour, no patriotism, his own idea being to squeeze all he could out of the people for his own pleasures and gratifications. He changes his ministers with alarming frequency, and a change of ministry always means the fall of several heads, and the consequence is that the country is wretchedly and miserably governed. The one ambition of every Korean is to possess a brass dinner service, but such a luxury inevitably brings about visit from the mandarin, who confiscates the family plate, and makes increased exactions on the ground of the wealth of its unhappy possessor. Although Mrs. Bishop had little that was complimentary to say for the King or the upper classes, and nothing but pity for the oppressed peasant, she highly eulogised the country itself, which is extremely picturesque and very fertile, being capable of supporting a much larger population than it possesses. Her lecture throughout was of the greatest interest and was illustrated by a comprehensive and unique series of lantern slides from her own negatives. It was not an explorer's lecture, but rather full and graphic account of the life, dress, manners, and general characteristics of the Koreans, and was listened to with evident pleasure by the large audience, applause being frequent and hearty.

#### COMING EVENTS.

The CHAIRMAN said that, in consequence of the *Conversations of the Society of Arts* having been arranged for June 20, the proposed reception at Society's new house in Russell-square would not take place on that day.



was proposed, however, to hold that function on June 27, but no final arrangement had yet been made. At the Ordinary Meeting, on June 13, Professor Vivian Lewes will read a paper on "Acetylene," and on June 20 Mr. Redmond Barrett will probably discourse on "Retouching."

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 18.—Mr. Robert Beckett in the chair.

Mr. R. CHILD BAYLEY read a paper entitled

##### EXHIBITIONS, TECHNICAL AND OTHERWISE. [See p. 329.]

Mr. J. E. HODD thought the lecturer had struck the right note in suggesting that the trade could help very much towards making exhibitions more popular and more profitable from a promoter's point of view. He felt that the trade would be glad of an opportunity of stepping in to help create a new interest in exhibitions, and there were many points in favour of the New Gallery to recommend it for an exhibition. To indicate the interest the trade had already shown in such exhibitions, besides the Crystal Palace Show, there was that at the Portman Rooms, which was well patronised and proved helpful to everybody; and Eastman's Exhibition at the New Gallery was perhaps the biggest success in the direction of combined pictorial and trade exhibitions, though confined to the wares of one firm, that had ever been held. He thought that, in these days of perfect materials and appliances, mere good technique was little to base claims for distinction upon. There was no excuse for bad technique nowadays whatsoever.

Mr. A. T. HARRIS thought that, so long as promoters of exhibitions set themselves the task of finding methods of making the trade bear the expense, so long would the trade be unlikely to take up with exhibitions to a large extent. It was only reasonable that, if the trade were expected to pay the costs, they should receive more space and more encouragement. The trade was not philanthropic, but a money-making concern, and it was a poor inducement, after incurring much expense over a stall, to be visited only by a class of people who looked at the apparatus and materials from everything but a purchaser's point of view. He was convinced that the photographic trade was an energetic one, and one which, given the chance, would be quite ready and willing to come up to the front.

Mr. A. MACKIE thought that the doctrine that anybody could edit a paper better than the editor himself was applicable to photographic exhibitions, for it seemed that the biggest fools in the world were always chosen to manage exhibitions, according to many. As a matter of fact, any exhibition must necessarily be a series of compromises, and there was no such thing as a perfect exhibition. It was not to be supposed that, when an individual finds something obviously wrong at an exhibition, it is due necessarily to carelessness. Often enough that very point which looks wrong has been the subject of much consultation, and is only as it is seen because its alteration would involve defects worse than itself. He agreed with the lecturer, regarding technical exhibits, that a display of purely technical work would have no attractions for the average member of the public. He had not the slightest doubt that the majority of people who went to exhibitions went to see what was termed pictorial work, and only a very small section of the public was at all concerned with photography in its technical aspects. How many people in a thousand, he asked, were interested in the most remarkable of photographs of the heavenly bodies, or any other of the various applications of photography? He thought very few indeed.

Mr. W. D. WELFORD said that, seeing that photographic exhibitions were supported entirely by the public, it was due to the public and to their money that the exhibition succeeded. The promoters had to look to the public for the money to support the exhibition and make it pay, and it was nonsense to talk about catering for any one class. In an exhibition there were bound to be a number of conflicting elements which it was a difficult matter to combine.

Mr. S. HERBERT FRY said it occurred to him that these exhibitions were not held from any one single motive. The main consideration in his mind wanting elucidation was why photographic exhibitions were held at all. The main object of the Pall Mall Exhibition, he took it, had been the advancement of photography, and the officers and many members, in the most unblushing way, say they do not mind whether it pay or not. In fact, they are rather proud now that it does not pay. But, while this may be a legitimate reason for the Royal, whether any other body would think so is rather unlikely. Another reason for exhibitions lies in the fact that many societies keep together alone by their help, and an entirely different set of rules would obtain for this purpose than for the other. Then, the Salon, originally started from party motives, it is maintained because excellent work is shown there. However, to his mind, the notion that professionals were at all interested in exhibitions was a fallacy.

The CHAIRMAN expressed the opinion that Judges should give reasons for their decisions, and that in this way an incalculable amount of help was to be given.

There was a long and interesting discussion upon the paper and exhibition matters as a whole, to which Mr. Bayley finally responded.

North Middlesex Photographic Society.—May 15, Mr. S. E. Wall in the chair.—Mr. H. W. BENNETT, F.R.P.S., gave a lecture on

##### PRINTING FROM THE NEGATIVE.

He described the principles of the various printing processes and the class of negative suitable to them. Carbon required the densest, then platinum, albumen, and gelatino-chloride in the order named. In the rendering of detail gelatino-chloride came first, then carbon, albumen, and platinotype the last. He set forth the advantage of using an actinometer for platinotype, and passed round one contrived by himself, the principle of which was judging by the faintest square shown on printing through layers of tissue papers in graduated numbers. He used in this P.O.P., finding that, even on keeping a considerable time, the speed of printing did not vary appreciably. He also gave relative speeds of the various commercial sensitised carbon tissues, judg-

ing from a P.O.P. print printed as appeared right before toning and fixing. Brown tissue required longer printing than black. He also stated that the home-sensitised tissue was considerably faster than ready-sensitised, which was endorsed by several members.

Hove Camera Club.—At the General Meeting the following were elected officers for the year 1899-1900:—President: Mr. G. B. Woodruff, Mayor of Hove.—Vice-Presidents: Messrs. Charles Job, E. E. Manwaring, and W. H. Hornsmon.—Committee: Messrs. W. A. Frid, F. C. Foskett; D. J. Gadsby, H. S. Gilkes, R. C. Ryan, and A. R. Sargeant.—Hon. Treasurer and Secretary: Mr. C. Berrington-Stoner, 24, Holland-road, Hove.

Leeds Photographic Society.—The winter session of the above Society was brought to a close by a *Conversazione* held in the Philosophical Hall, Park-row, Leeds, on Tuesday, May 16, when the President of the Society (Mr. Godfrey Bingley) and Mrs. Bingley received the members and their friends. The early part of the evening was devoted to witnessing practical experiments of a nature especially interesting to the amateur photographer. Mr. F. W. Branson, F.I.C., gave an exhibition of the new apparatus for the creation of the now well-known and serviceable Röntgen rays, and demonstrated the production of cathode and Röntgen rays direct from an alternating current of fifty volts by means of Wehnelt's electrolyte "make and break" and an induction coil without condensers. This, being a comparatively recent discovery, proved a great attraction, as no public experiment of the kind had previously been made in the city. Wireless telegraphy was demonstrated in the lecture theatre by Mr. WILLIAM WALLACE, M.A., F.R.S.E., who showed in operation a series of exhibits to illustrate the subject, and gave a short and instructive explanation of the different methods employed by Preece, Lodge, and Marconi. The President also exhibited a series of lantern slides illustrative of a tour in East Anglia. The second portion of the programme was taken up by a concert in the lecture theatre, songs (humorous and otherwise), recitations, and pianoforte solos being ably rendered. A short statement was made during the course of the evening by the officials, showing that the Society was in a most flourishing condition, and announcing a very attractive syllabus for next session. The whole proceedings distinctly pointed to the great interest taken in the Society's welfare by photographers in the city, and augured well for the membership roll in the forthcoming season. A vote of condolence was passed with the family of the late Dr. Bendelack Hewatson, who was a prominent supporter of the Society.

## Correspondence.

- \* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.
- \* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### BAS-RELIEF PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—With reference to the correspondence relating to the secret process for the production of bas-relief photography, and your editorial comments thereon in THE BRITISH JOURNAL OF PHOTOGRAPHY of April 28 and May 6, we beg to state that our solicitors have instructions to prosecute any person found infringing our patent rights.—I am, yours, &c., for and on behalf of the Taber Bas-relief Photographic Company, J. H.  
141, New Bond-street, W., May 18, 1899.

#### A SOCIETY FOR PHOTOGRAPHIC PRINTERS.

To the EDITORS.

GENTLEMEN,—Mr. Willatt is mistaken in supposing that I view the question of trade unionism for photographic assistants through organizations already formed. If Mr. Willatt will refer to your issues of April and May, 1895; April and May, 1896; May 21, 1897 ("A First-Class Reference"); September 3, 1897 ("The Wages of Photographic Assistants"); also the ALMANAC, 1897, p. 756 ("A Trade Union for Photographic Workers," by Arthur Field); and the ALMANAC, 1898, p. 784 ("Trade Unionism once more"); and my pamphlet, "The Photographic Worker," he will find that my conception of trade unionism is fairly broad. What I do hold, however, is that, whilst the principles of trade unionism are the same in all unions, the particular manner in which these principles are applied must be determined by circumstances. Hence my practical policy is joining the National Union of Shop Assistants, because that union meets our requirements better than any other. This is clearly an indication of what can be done, and not what we should like. In opposition to this, Mr. Willatt advises a "restrictive union," such advice being superfluous, since by its very nature every trade union is restrictive, otherwise it would not be rightly termed a trade union, and the root of this exclusiveness is the "wage limit," which your correspondent coolly drops. I allow that the National Union of Shop Assistants is not so restrictive as the Engineers' or Compositors'. Why is it not? Simply because a smaller percentage of shop assistants are unionists. Restriction thus comes at the end of organization, whilst Mr. Willatt seems to imagine that he can "right off the reel" secure the perfect discipline of engineers or compositors. That idea is a plain



allacy. It is thus idle to remind your readers "that no assistant in photography can at present join a restrictive union." The above union is a real trade union, which will be very evident directly it is in a position to fight out the question of hours, and overtime. At present it confines its operations to provident payments, unemployed benefit, ventilation of grievances, and removal of injustice, and by so doing I think it acts wisely. I have indeed no hesitation in saying that it will do for the photographic assistant all that can be done, things being as they are.

Mr. Willatt's plan of a "general centre," &c., is, I am afraid, very much in the air, just as much as the "Guild of Photography" I sketched out in this column in 1895; something which has yet to take on "a local habitation and a name" I will leave both for, as Amiel said, "the unfinished is nothing."

In strong contrast we see the National Union of Shop Assistants in working order, with a membership of thousands, a balance in hand, and a branch in many of the most important centres, the very fact of its success proving that it is worked on the right lines and meets the needs of its members. So much cannot be said of unions which have been copied from organizations fashioned to meet the wants of other occupations. Mr. Willatt must remember that the conditions which prevail in shops and photographic establishments are feudal and a relic of the middle ages, the photographic assistant once engaged becomes in law and custom the "servant of his master," meaning that, apart from his employer, he has no rights of his own. To meet this peculiarity, a plumbers' union would be useless.—I am, yours &c.,

May 20, 1899.

JOHN A. RANDALL.

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

A. England, Triangle Studio, New Barnet.—Three photographs of a parrot and cat.  
W. T. Westhorpe, jun., 34, North-street, Wandsworth, S.W.—Photograph of model frog and beetle boys dressed as frogs arranged in group.

F. W. Urquhart, 3, Balacava-buildings, Dingwall, Ross-shire.—Two photographs of Colonel Hector Archibald McDonald, C.B., D.S.O., A.D.C.

W. JOHNSTON.—The circulation is limited in this country. You might obtain copies of Messrs. Percy Lund & Co., Bradford, or Messrs. Dawbarn & Ward, 6, Farringdon-avenue, E.C., price about 1s. 6d. each.

BROMIDE-ENLARGING.—S. WRIGHT. The enlargement sent clearly shows that the grey lights are caused by light fogging the paper, probably at the time it was being exposed in the enlarging room or camera, or at least at some stage of the work.

STAINED PRINTS.—W. The stains are unmistakably caused by the mounts. The chocolate colour upon them comes off when they are moistened, as with the starch mountant, and thus the print becomes stained while drying. We have rarely seen mounts on which the colour is so soluble.

MEDIUM FOR SPOTTING.—RETSEF says: "I shall be glad if you will kindly inform me where I can get some medium for spotting enamel P.O.P. prints."—Special colours are sold for the purpose, and may be had from most of the dealers. We are unable to say how the makers prepare them.

COPYRIGHT QUESTION.—G. & S. ask: "Can another photographer take a photograph of ours and have it enlarged to 15 by 12, then canvass with it as their own work in the same town as our studio is situated?"—In reply: Yes, if the copyright of the original does not belong to our correspondent.

MOUNTING SOLUTION.—T. FRASER says: "I have made up solution for mounting prints exactly as described on page 1061 of this year's ALMANAC. When cold it is quite solid. Should this be? or should it not be always ready for use?"—Yes, the solution when cold is a stiff jelly, and requires warming for use.

CRYSTOLICUMS.—A. LAMBERT asks "the number and date of the patent that was taken for colouring photographs from the back?"—In reply we ask which patent? Patents innumerable have been taken for this system of colouring, with but slight modifications, at different times. The first, if our memory serves us rightly, was in the fifties.

FORMULA WANTED.—J. BARRY says: "I would thank you to give, in an early issue of your JOURNAL, formula for ferro-gallic paper (water bath only) for plan printing."—There are many formulae, but this is a good one: Ammonio-citrate of iron, 4 ounces; water, 14 ounces; ferrid-cyanide of potassium, 2½ ounces; water, 15 ounces. For use, mix in equal parts and coat the paper. The iron printing processes are very fully treated upon in the ALMANAC for 1889, and by Mr. Lambert in recent JOURNALS.

CLEANING OFF OLD NEGATIVES.—J. WULF writes: "I have a quantity of old negatives I want to clean off so as to use the glass for another purpose. Can you kindly tell me the simplest way to do so?"—Soak the plates in cold water for a day or so, and then put them in hot water. The film will then dissolve off, and the glass can easily be cleaned.

ENAMELLED DISHES.—G. SELTH. Enamelled iron vessels will do very well for photographic purposes provided the enamel is perfect; but if any of the iron is exposed they will not do for silver printing. For carbon work, for which we presume, from the tenour of your query, you require them, they will do quite well even if the enamel surface is not absolutely perfect.

COPYRIGHT.—WANT TO BE SAFE says: "I have seen some excellent photographs of Hogarth's *Industrious and Idle Apprentice*. Shall I be infringing any copyright if I copy these for lantern slides? Is there any copyright in Hogarth's engravings?"—No; but there may be in the photographic copies of them. If you copy the engravings themselves, you will be perfectly safe.

SPOTTY PRINTS.—T. MASON. The comet-like spots or specks are due to minute particles of matter that have reduced the silver where they have come into contact with the paper while in a moist state. Particles of iron, as rust, from the pipes, in the water in which the prints were washed prior to toning, would produce such spots, so would any other reducing agent in a fine state of division.

FAULTY FOCUS.—R. F. says: "Herewith a couple of negatives, taken in a magazine camera, fitted with a —'s fixed-focus lens. You will see they are far from being sharp. Do you think the lens is at fault? Are these lenses good?"—The negatives are anything but sharp, but we should say that is not the fault of the lens, but its being fixed out of focus. Return the camera to the maker for the lens to be adjusted to focus. The lenses in question are in good repute.

AGREEMENT AS ENGAGEMENT.—ANXIOUS says: "I should like your opinion on the following: I have been engaged as assistant to a certain firm in this town for a month on trial. As I do not like the situation, I gave notice at the end of the first week, but the firm in question will not allow me to leave until the end of the month. Now, as I signed no agreement for a month, can I not leave with a week's notice?"—As you agreed for a month, you should stop for that time, and leave at the end of it, unless your employer is agreeable to your leaving before.

LENS COVERING.—B. PRICE. 1. The prints show that the lens has a moderately round field, and, to cover the quarter-plate with a fair definition at the margins of the plate, it must be used with a medium-size stop. A lens with an aperture of  $f/5.6$ , of four-inch focus, must not be expected to cover a quarter-plate unless it be stopped down considerably. Considering the focal length of the instrument, we can see no fault to find with it if it be used for the size it is made for, namely, lantern size. 2. The shutter you have is one of the best in the market, though it is not the most costly. We do not think you would be benefited by making the change.

VERBAL AGREEMENT.—G. R. A. writes: "I am engaged here as an operator on an agreement (verbal) for a year certain at forty-five shillings a week. Have been working a fortnight, and giving every satisfaction. During the time I have learnt that it has been the custom with this photographer—who, it seems, always engages his operators for the year certain—under some pretext or other, to discharge them about October. Can you kindly tell me if I am likely to be served the same, as it is a serious thing to be thrown out of employment just as the winter sets in?"—We cannot say if you are likely to be thrown out at the end of the season, but you certainly are liable to be. Under this verbal agreement you are only a weekly servant, and can be discharged at a week's notice; also you can at any time leave, on giving a week's notice, if any better appointment offers.

BACKGROUND PAINTING.—BACKGROUND says: "Can you give me any information as to what colours are most suitable for distemper painting for photographic backgrounds, and what is the most suitable size to bind the colour? While admitting the necessity for special artists devoting all their time to the production of a certain class of backgrounds, I am of the opinion that, for certain effects, the photographic artist ought to be able to carry out his own ideas in that respect. Any information you can give on this subject will, I am sure, be of general interest."—The colours generally used are whitening and lamp black, with, sometimes, a little Venetian red to give warmth to the colour. The ordinary common size of the oil shops is used for binding the colour. The whitening and black are mixed in water, and the size added hot, and in sufficient quantity to form a tremulous jelly when cold. In that state it is used.

DEVELOPING FORMULÆ.—H. HARBOUR says: "I have some excellent formulæ based on the following stock solutions:—1. Pyro, 1 ounce; sulphite soda, 4 ounces; water to 9 ounces 48 minims. 2. Potassium bromide, 1 ounce; water, 10 ounces. 3. Ammonia, 1 ounce; water, 9 ounces. I desire to use metabisulphite as the preserver of the pyro, and soda instead of ammonia. Will you kindly tell me (in your Answers to Correspondents column), 1. How much metabisulphite should be put to the ounce of pyro? 2. What would be the composition of the accelerator? 3. In what proportion must I reduce or increase the quantities of the developer, restrainer, and accelerator respectively, now given in my formula, that the action may be the same as at present?"—1. The usual proportions are the same weight of the metabisulphite as of pyrogallic acid. 2. Carbonate of soda, 2 ounces; sulphite soda, 2 ounces; water, 10 ounces. 3. This may be used in the proportion of about 1 ounce of No. 2 to each 8 grains of pyrogallic acid, according to the exposure. A large number of pyro-soda developers are given in the formulæ in the ALMANAC.



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## EX CATHEDRA.

THE Britannia Works Company have added to their list of manufactures a platinum paper under the trade name of "Platona." They have adopted the well-known Ilford price (1s.) as a basis, twenty quarter-plate pieces in a sealed tin being retailed for 1s., twenty half-plate for 2s. 3d., and twenty  $8\frac{1}{2} \times 6\frac{1}{2}$  for 4s., the other sizes being charged for in proportion. We are informed that Platona paper will be ready for delivery on June 12, and that full formulæ and instructions for development will also be published. The Company have been engaged in the preparation of the paper for several months past, and we believe that, when it reaches the hands of the public, it will be found simple, easy, and reliable in working.

SOME specimen prints on the new paper have been submitted to us, and these show off the always admired qualities of a platinum print to perfection. We anticipate having an early opportunity of putting the new paper to practical trial. This new and enterprising departure on the part of the Britannia Works Company should materially help to further popularise

this most beautiful process, which has been so long held to yield the same of permanence in a photographic print. Any step which has for its object the exploitation of a printing method fulfilling the highest theoretical conditions of permanency in photographic prints deserves support, and we have no doubt that "Platona" will fulfil all the expectations that have been formed of it. By the way, the word "Platona" is a singularly felicitous trade name for the new-comer.

\* \* \*

THE next time the Article Club holds an Industrial Exhibition at the Crystal Palace or elsewhere, we shall not be over-eager to avail ourselves of the "honour" of being present, lest the treatment accorded to some representatives of the Press at Sydenham on Tuesday last should stand a chance of repetition. In the advance news note which accompanied our invitation ticket we were told that a special attraction during the whole of the Exhibition would be the Court of the Biograph and Mutoscope Company. "There will be regularly given up-to-date pictures of what the world is doing. It is expected that a record will be created on the opening day of the Exhibition, as the whole of the opening ceremony, which is timed for twelve noon, will be represented upon the screen before the Royal party leave the Palace."

\* \* \*

WE were naturally anxious to see what was to be seen in animated photography at the Article Club Exhibition, but, in company with many others, our repeated efforts, extending over hours, to gain admission to the room proved fruitless. We believe the Article Club is run in connexion with a weekly contemporary. In that case the slight that was paid to this JOURNAL—we believe among others—on Tuesday last is doubly inexplicable, and we certainly think the Club owes its disappointed guests an apology, which it is to be hoped will be promptly forthcoming. Certainly, in our experience, we have not known of members of the Press being received so disrespectfully as on the occasion referred to, and, for our part, we desire emphatically to protest against such treatment.

\* \* \*

AN adaptation of the cinematograph for advertisement purposes by night has been worked out by Mr. W. I. Chadwick, of Manchester, who has formed a company to exploit it under the title



of Chadwick's Patent Advertising, Limited, with a large capital at command. Some of the very large advertisers have already taken advantage of the system, which is meeting with great success in the northern towns and villages. It is obvious that animated photography for advertisement purposes possesses possibilities that have not yet been tapped, and the method adopted by the Chadwick Company of allowing numbers of persons in different places to view the pictures is one that must commend itself to the attention of business men. Without precisely indicating the plan worked out by Mr. Chadwick, himself an old hand at optical projection, we may say that it is clever and novel, and should be very popular among those to whom it appeals.

\* \* \*

MR. EZRA CLOUGH (Hon. Secretary of the Yorkshire Photographic Union) sends us a list of lectures which are to be placed at the disposal of societies having membership of the Union during the coming session. We must certainly congratulate the executive of the Union both on the alacrity it has exhibited in getting to work in this important matter and the number and variety of the lectures that have been arranged for. If early appearances count for anything, the Union bids fair to have a successful career. So far its proceedings have been prompt and businesslike.

\* \* \*

We append the list of lectures. The figures in parentheses indicate the number of times the lecturer is prepared to repeat his lecture in a session: W. H. Atkinson, "A Night among the Flowers" (3). Godfrey Bingley, choice of the following five subjects, (6): I., "Lantern-slide Making;" II., "North Wales;" III., "The Dales and Coast of Yorkshire;" IV., "London to North Cornwall;" V., "East Anglia and Adjacent Counties." Harold M. Briggs, "Exposure" (3). Harry B. Buckley, "Instantaneous Photography" (3). B. A. Burrell, F.I.C., choice of the following two subjects: I., "Chemicals Used in Photography;" II., "Weights and Measures." Sparham Camp, "Rivers and Broadlands of Norfolk" (3). Fred T. Coupland, "Carbon: Single Transfer" (3). H. Crossley, "Bromide Enlarging" (3 or 4). Rev. W. Hay Fea, M.A., "Holderness" (3). William H. Hainsworth, "In the English Lake District with a Camera" (3). Thomas Heaps, "The Dry Plate: What is it?" (3). J. Hollingworth, M.R.C.S., "Photo-micrography" (2). Alexander Kelhley, F.R.P.S., choice of the following two subjects: I., "Principles of Art Applied to Photography" (2); II., "The History of Photography" (2). J. W. Laycock, choice of lectures below (2 in October): "The Rhone Valley, Rome and Revolutionary France;" "Western France and the Pyrenees;" "The Riviera." Percy Lund, "Some Prominent Photographers and their Work" (2); "Tom, Dick, and Harry, Amateur Photographers" (2); "Trees as Photographic Slides" (2). J. Hudson Lygo, "Carbon Printing, Single and Double Transfer" (3). Samuel Margerison, "What we See in an Old Church" (3). P. E. Newstead, "Some Photographic Types." Arthur H. Ormerod, choice of the following four subjects (3): I., "Recent Advances in Colour Photography;" II., "Orthochromatic Photography;" III., "Cycling and Photography;" IV., "Practical Hand-camera Work." A. Priestley, choice of the following three subjects: I., "Hints on Portraiture;" II., "Bromide Enlarging;" III., "Development for Beginners." J. V. Saunders, M.A., "Knightly Effigies, and How to Photograph Them" (2).

Percy Sheard, "Cairo to the First Cataract." R. Stockdale, "Carbon-process Demonstration" (3 to 6). James Taylor, "Stereoscopic Photography" (3). George Thistlethwaite, "Lakeland, with Cycle and Camera" (3).

\* \* \*

THE June issue of our contemporary, the *Photogram*, is double the size of the ordinary number, at no increase of price, and it is full of interesting and suggestive matter. There are three supplements, a print on Velox, a wall calendar for the month, and an exhaustive index of photographic trade names extending to twenty-four pages. This index must be exceedingly serviceable for reference to all commercially engaged in photography. An article, "The Next Great Step in Photography," is a powerful plea for the every-day adoption of photography in business and private life. Many other noticeable articles complete a singularly attractive number of the *Photogram*.

\* \* \*

MESSRS. CADETT & NEALL, of Ashted, are issuing a little book entitled *Orthochromatic Photography Simplified*, by Mr. Cadett, from which, in another part of this week's JOURNAL, we give some extracts. The use of measured light-filters in conjunction with Messrs. Cadett & Neall's spectrum plates constitutes a very important step in advance in orthochromatic work, and the extracts from Mr. Cadett's essay will serve to enlighten the reader upon the principal points of theory and practice which have been kept in view in working out this scientific system of orthochromatic photography.

\* \* \*

ANAGLYPHOSCOPY is apparently in a way to achieve some popularity in the United States. An American friend has been kind enough to send us some samples of anaglyphs by the Redheffer Art Publishing Company, Chicago. These are coloured half-tones printed on cards. The dissimilar halves of the stereoscopic pair are printed in red and blue inks, and of course do not exactly superimpose. A pair of spectacles having red and blue glasses are provided, and when the anaglyphs are viewed through the spectacles a very fine stereoscopic effect indeed is obtained. The Redheffer Company mark their cards "patent applied for." Of course the anaglyph owes its origin to Du Haeron. However, the idea is so good, and the results yielded so striking, that it is a pity more attention is not devoted to it in this country.

\* \* \*

DEvised by Mr. F. Whaley, the well-known photographer of Doncaster, Messrs. Marlon, of Soho-square, are introducing a system of portable studio screens, which enable the operator to be independent of blinds on the roof. It consists of a series of brass or iron supports covered with light grey fabric, and, owing to an ingenious system of bolts and screws, the screens, which rise to a maximum height of about ten feet, may be fixed in practically any direction up to that height. The screens are opened and set up in a few seconds, and when closed measure six feet by five inches by five inches. They give the operator perfect control of the light, and are exceedingly light and portable.

\* \* \*

By the aid of the Whaley studio screens it is pointed out that the following advantages may be obtained: Either light or shadow can be thrown on any part of the sitter. They can



be used for busts as well as full-length figures or groups, and either the top or side light may be used together or separate, and also for drawing-room portraits. Amateurs can photograph in their own gardens equal to in a first-class studio. They are useful to the artist and the drawing school for lighting any kind of model. Numbers of professional photographers will appreciate the convenience of these screens, which also appeal to many other kinds of artistic workers, with whom easy control of light and shade is a matter of importance.

\* \* \*

ALTHOUGH the session of the Camera Club closed a fortnight ago, the annual Exhibition of members' work will remain on view for a few weeks longer. The Exhibition includes over a hundred photographs, amongst which are some transparencies by Mr. Henry Stevens, photogravures by Mr. Wilmer, and other contributions by some of the best-known members of the Club—Rev. T. Perkins, Henry Speyer (whose Alpine views are remarkably good), Tom Bright, T. Manley, Major Lysaght, Law Bros, R. W. Craigie, in addition to those mentioned in a previous notice.

### STUDIO CONSTRUCTION.

OF the questions, requiring answers in that part of the JOURNAL set apart for the purpose, which are addressed to us week by week, a large proportion relate to studio construction. The suitability or otherwise of a certain aspect of light; dimensions; the most desirable kind of glazing and blinds; the pitch of the roof; the adaptation of existing apartments to studio purposes—these and many other cognate subjects supply the bases of those questions. It can scarcely be wondered that with young professional photographers, particularly those just starting in business, and having little or no experience in portrait work, the provision of a suitable studio by the most economical means is a matter of supreme importance, and consequently it is not surprising that so many questions on the subject should be put to us.

It has probably escaped the notice of many of our professional readers, including those who seek our advice on matters relating to studio construction, that about four years ago a little book on the subject was published by that able writer, Mr. Thomas Bolas. This book is entitled, *The Photographic Studio: a guide to its construction, design and selection of a locality*.\* There is so much sound and useful information on studio building, &c., condensed in Mr. Bolas's book that we shall devote this short article to a recapitulation of its main features. We believe that many of our readers will be glad to know of the existence of the book, and will be induced to take the opportunity of applying some of the valuable hints it contains to the case of their own needs in studio design and construction.

Mr. Bolas's work consists of eleven chapters. An historical and introductory note briefly traces the development of the photographic studio from the days of the Daguerreotype with its long exposures down to the open-area studio, with its glazed side towards the north—the prevailing form of to-day. This form of studio is minutely dealt with in the second chapter, which describes it in its most favourable position, that is, either in the country or the suburbs. The structural details of this particular form of studio, which has its aspect inclined a very little to the east (N.N.E.), are very full, and

are such as would enable the photographer to build an excellent glass house for himself in the rear of an ordinary dwelling-place. Indeed, the chapter, which extends to about twenty pages, is replete with the most practical details. We may here say that the studio described is an actual structure erected by the well-known photographer, Mr. W. E. Debenham.

In his third chapter Mr. Bolas strikes ground over which many a photographer obliged to work in towns will gladly follow him. He deals with the needs of the city photographer, and discusses the best means of adapting confined situations, at the tops of houses, &c., for studio purposes.

Special studios are figured and described in Chapter IV., modifications of the north aspect or open-air studio, and their adaptation to various conditions, with a view to making the best of an unfavourable position, being closely outlined. Moreover, the author is at pains to show forms of studios which are best avoided. This chapter and the one preceding it condense a vast amount of serviceable information which meets the very numerous cases that come before us where photographers in confined places, and having no choice of situation, are puzzled to know how best to avail themselves of the restricted circumstances by which they are governed in erecting a studio in which variety and excellence of effect in lighting are to be obtained.

The tunnel form of studio next comes in for reference, and, incidentally, Mr. Bolas points out its advantages for copying purposes. The south light studio also occupies a separate chapter. Many years ago Mr. Valentine Blanchard erected and successfully worked in a studio having this aspect, and by the aid of diagrams, and quoting Mr. Blanchard's own description, Mr. Bolas shows how this somewhat unusual form of studio was successfully employed.

In succeeding chapters the subjects of curtains, blinds, and screens; heating, cooling, ventilation, and cleaning the glass; municipal building regulations; sash bars and glazing; glass for the studio; illumination and distance, &c., are briefly noticed.

We have said sufficient to show that this little book on "Studio Construction" deserves to be better known by professional photographers than it probably is, and, if in thus directing prominent attention to it we are at all instrumental in making it so, we shall be very pleased. Certainly it meets the needs of a large class constantly seeking information on a vital matter, which has the peculiarity of differing in nature with the individual. The larger and more complex subject of the adaptation of the ordinary dwelling-room to the needs of portraiture does not here come in for notice. It should, however, be borne in mind that we have had only in view the requirements of photographers for the erection of studios for every-day work and it is in their interests alone that we have directed attention to Mr. Bolas's book.

**Rise in the Price of Silver.**—During the last two or three weeks the price of metallic silver has advanced considerably, and it is dearer now than it has been for the last year or two. Photographers are at the present time not so directly interested in the price of silver as they were in the collodion days and when they had to sensitise their own paper for printing. Although the price of silver is now comparatively high to what it has been, it is still considerably less than half the price it at one time was. Now it is varying in price between 28*d.* and 29*d.* per ounce; in the sixties it was quoted as high as 62*d.* per ounce. Not only at that period was

\* Published by Marion & Co. 94 pp. 28 illustrations. Price 2*s.*



the price more than double what it is now, but then it was customary to sensitise the paper on solutions of more than twice the strength that is usual with the majority of those who now sensitise their own papers. This shows that photography was far more costly then than it is now. It also shows that the value of the residues was very different then from what they are at the present time. This fact should be borne in mind by those who complain that the returns made by refiners for residues are so widely different from what they received in days gone by.

**Testing for Acetone.**—The growing popularity of this substance as an addition to the developer renders interesting a lately published method of testing a liquid for its presence. If the liquid be an aqueous one, a small quantity must be mixed with an equal bulk of a mercuric reagent made by dissolving in a test tube 5 grammes of mercuric oxide in a hot mixture of 20 grammes sulphuric acid and 100 of water. The mixture is plunged into boiling water, and, if after ten minutes' boiling no precipitate or cloudiness appears, acetone is not present; if, after a lapse of at least forty-five seconds, a precipitate or cloudiness is seen, acetone is to be assumed as present, the extent of the precipitate indicating the amount present. If a methylic solution have to be tested, a similar programme is followed, but the proportions are equal parts of the solution, methylic alcohol, and water, and double the quantity of the mercury reagent, which must be diluted with water, as the undiluted methylic alcohol when heated is sufficient of itself to precipitate the mercury. If the mixture be an ordinary alcohol, it must be diluted so as not to indicate more than two degrees of alcohol, or the mercuric sulphate arising from the reducing action of the alcohol will be reduced upon boiling. The process is capable of detecting 0.3 per cent. of acetone.

**Aqueous Solution of Metallic Gold.**—In a recent number of the *American Chemical Journal* a remarkable paper is given upon this subject by Richard Zsigmondi. He states that there are various modes by which gold can be dissolved in water with various conditions of colour, but not to the extent to which Carey Lea obtained with solutions of metallic silver; yet deep red, blue, and black were obtained, as well as shades between. The red solution is that to which the experimenter gave most attention. It was made by adding various reducing agents, such as formic or acetic aldehydes, alcohol, or even hydroxylamine, to very dilute boiling hot and slightly alkaline solutions of chloride of gold. The best proportions, arrived at after many experiments, were 25 c. c. of an 0.06 per cent. solution of chlorauric acid ( $\text{AuCl}_3 \cdot \text{HCl}$ ) were diluted with from 100 to 150 of pure distilled water rendered alkaline by the addition of 2 to 4 c. c. of a  $\frac{1}{20}$  normal solution of potassium carbonate; the mixture to be boiling and instantly removed from the flame, and 4 c. c. of one per cent. aqueous solution of freshly made formic aldehyde gradually added to the boiling solution. In a short time the colourless solution darkens, becomes light red, and in a few seconds attains a deep red colour, which does not change in the slightest degree by boiling or after being kept several months. The directions must be strictly adhered to, or the liquid may become turbid or dark purple. The above red liquid may be concentrated, by evaporation, to half its bulk without precipitation, but beyond that concentration a precipitate is produced. By dialysis it may be purified at a temperature of  $40^\circ$  to  $50^\circ$  and still retain its colour when so reduced to one-twentieth of its volume, solutions of 0.12 per cent. being obtained; but this was the extreme possible limit of strength, further concentration resulting in a deposit of metallic gold on the parchment. The liquid may be filtered and is quite tasteless. The similarity between the colours of these solutions of gold and the colours of thin layers of gold by transmitted light is marked, as well as that of rose or ruby glass, the absorption spectra being identical in the two cases. It would appear from this that we here have an excellent medium for filling cells for filtering out the actinic rays from light in a dark room.

**New Monochromatic Light.**—At a meeting of the Paris Academy of Sciences last month, MM. Ch. Fabry and A. Perot described a new and very powerful monochromatic light from an electric current. The light is of the arc type, but the poles are mercury surfaces *in vacuo*, the mercury being contained in two concentric glass tubes and the surfaces being only just separated by the inner tube. A current of thirty volts and two to three ampères is all that is required. The arc is started by giving the arrangement a slight jerk, which ensures a momentary contact, with the usual result of setting up the illumination. The light is not completely pure, but can be rendered so by the interposition of suitable screens; for example, a cell containing a solution of didymium chloride and potassium bichromate absorbs all rays but the green.

**Bequerel Rays.**—This term is now a recognised form of expression to describe those actinic rays given off by certain bodies, and which possess characteristics greatly resembling the Röntgen rays. Professors Elsler and Geitel have been investigating the subject, and sent two papers regarding it to *Nature*. We have, on several previous occasions, referred to them and to Sir Wm. Crookes' theory of their energy being derived from the air, or that it is due to the influence of external radiations falling upon the emitting salts; but the experiments in these papers appear to be adverse to those theories. The authors also confirm the discovery (already described by us) made by M. and Mde. Curie, of certain substances derived from the uranium pitch of Joachimsthal, in Bohemia, which are capable of emitting Bequerel rays of great intensity.

**Discussions at Societies.**—Too often, when a paper is read or a lecture is given on any particular subject, and a discussion ensues thereon, the main point of the paper is lost sight of, the discussion centering on one or two trivial points in connexion with it, sometimes entirely outside it. A case in point was that as shown by our report last week of a recent meeting of the Camera Club, when Mr. Alfred East, A.R.A., gave a discourse on "Art." Mr. East happened, by way of illustration, to give a passing notice of a certain picture with a moon in it. Forthwith the chief topic of a very excellent discourse was lost sight of, and the discussion centered entirely upon the apparent size of the moon when in different positions. When this discussion, on an insignificant point compared with that which was before the meeting, had "pegged out," the meeting concluded with the usual vote of thanks to Mr. East for his lecture, though the main feature of it was ignored. This kind of thing is of too frequent occurrence at society meetings. But whose fault is it? The answer is, chiefly the Chairman's, in not keeping the discussion confined more closely to the main subject immediately before the meeting, and not letting it divert in the way it does frequently into other subjects foreign to the title of the paper.

**Weather Forecasts.**—We have often referred to the weather forecasts as issued from the Meteorological Office. The Meteorological Council have just decided that the issue of hay harvest forecasts can no longer be made gratuitously, but that they will be supplied in the usual form to persons desirous of obtaining them on the payment of the cost of the daily telegrams during the period over which the forecasts are issued; also that, when so requested, the charge for portage will be arranged for by the Meteorological Office, an additional payment being added to the charge for the telegrams. Forecasts also for the wheat harvests will be supplied on the same terms. Judging from the results of previous hay and corn harvests' weather forecasts, as supplied from the Meteorological Office gratuitously, it will be interesting to see, in the next annual report issued by that department, how many have paid for forecasts to be sent them. It would still be more interesting to learn whether they had full value for their money. That, of course, will not be seen from the report. If these weather forecasts were more reliable than they often turn out to be, they would be an inestimable boon to out-door photographers, and would frequently be availed of. At present they are set at naught.



**St. Paul's.**—Evidently the recent agitation by artists and architects has caused the Dean and Chapter of St. Paul's to hold their hands, for we are told by the Press Association that the Decoration Committee has decided that the stencilling should be removed, and that it was desirable, before proceeding to do so, to see what would be the best mode of finishing the arches by completing the south-west dome without any decoration of the flat stonework. It was also agreed at the Committee's meeting that the panels on the fourth quarter dome should not be proceeded with until the Committee have seen the effect of the whole of the south-west section being so treated. Wren's masterpiece is a fine work as it is, and it would be a piece of vandalism to mar it with incongruous "embellishments" or "decorations." But the question is, Does it require any at all? By the way, we, two or three weeks ago, called the attention of photographers to the fact that just now, through the pulling down of some buildings, a view of the Cathedral is to be had from Cheapside that may not occur again. There is a proposal, and it is not a new one, that the north side of St. Paul's Churchyard should be widened and thrown open for vehicular traffic. If that were done, we should thus be able to see our metropolitan Cathedral to much greater advantage. It is doubtful, however, owing to the value of space in the City, if this will ever be done. Unfortunately St. Paul's, like most other fine cathedrals at home and abroad, is so surrounded by buildings that they cannot be seen to advantage, let alone photographed.

**An Old Friend Once More.**—Like the discovery of colour photography, the sea serpent periodically goes the round of the press. This old friend of the paragraphist, so it is said, has not only put in his, or her—sex not stated—appearance in Kilbrannan Sound, but is still continuing its ravages, and fishermen arriving in port one day last week state that the monster followed the skiff, *Puritan*, "fully 100 yards, sniffing and snorting just behind the rudder, and was with difficulty scared off." A harpooning expedition from the port, it is said, is being projected. If such an expedition is carried out, it is to be hoped that it will be accompanied, like most expeditions now arranged, by one or two photographers. Then, if the harpooners fail to secure the monster, the latter may succeed in obtaining a few photographs of this reptile, fish, or whatever it may be. One or two snapshot photographs, if secured, would certainly conclusively prove that our old friend, the sea serpent, was, at least, not a mythical entity. Here is an opportunity for the local photographers of the district to distinguish themselves. The photographs of such a famous thing would certainly command a ready sale all over the world.

#### JOTTINGS.

SHOULD exhibitions of photographs be judged by painters, etchers, black-and-white artists, and so forth? This is an old question that is again engaging attention, in view of the probability of several members of the Royal Academy being placed on the jury for next autumn's Royal Photographic Society's Exhibition. If the rules of the Society included one that debarred non-members from being chosen as Judges, this question would not arise. Personally, I object to painters being set to judge photographs unless they are thoroughly well grounded in practical photography, are conversant with its pictorial achievements, and can estimate its possibilities; they should, in fact, be right in the "photographic movement." Unless they have that special knowledge, they are apt to give decisions which photographers cannot understand, and that dissatisfy as well as mystify them.

My ideal jury would be entirely made up of photographers—such men as Emerson, William Crooke, Walter Barnett, Gale, Mendelssohn, and others who might be named. These men have gone through the mill of photographic study and are still students. They know how to use a lens as a drawing instrument; they have mastered composition, lighting, posing, grouping, all with a view to their

translation by a sensitive surface; they can tell whether a photograph has been "faked," how much is due to multiple printing, Chinese white, the knife, accident, or intention, what the picture owes to the printing process employed, and whether the photographer be a copyist, an imitator, or a man of originality. They, as I have said, are in the movement. Now, your painter has no concern in these things. Once a year, for an hour or two, he looks at a few hundred photographs, gives his decisions, vanishes, and is seen no more for another twelve months. With photography in the sense I have endeavoured above to make clear he does not concern himself.

Of course, I am not censuring those eminent painters who are kind enough to act as Judges of photographs. It is the system that I go for. I am convinced that photography will always be looked down upon until we become a little more self-reliant. Even from the Salon a useful lesson in this matter may be learned. The Dudley Gallery people do not call in outside assistance to do their judging, for, according to the Salon creed, to be hung in Piccadilly is an honour. I can call to mind no other exhibition but that of the Royal Photographic Society which goes to outsiders—presumably non-practical men—for its Judges. On the other hand, I am only too well aware that as possible Judges the number of photographers is very few. There is not a large choice. But the number is not likely to increase while the painter policy is persisted in. Again, I know that many people like initials after the names of Judges. To them a photograph acquires much more value if medalled by five Academicians instead of five photographers. This is a powerful human sentiment, which is hard to destroy. Still the broad fact remains, that there is no real, no insuperable reason why an exhibition of photographs should be submitted to a group of painters for judgment; on the contrary, as I have tried to show, the arguments are all the other way.

It is time photography stood by itself in these matters. So left by the Academicians and others, it might at first be a little unsteady, that is to say, a sufficient number of ideal Judges might be a long time forming, but I believe that in years to come the growth of pictorial photographic knowledge and study would call up a class of cultivated men to whom photographers would have no hesitation in submitting their works for judgment. Now, the longer we rely on the help of outsiders the longer delayed that time will be, and the farther off the hour when photography will stand alone and be respected for itself. This year circumstances were not favourable to the trial of the photographer—Judge; next year, however, with an awakening of the interest of Royal Photographic Society members in the constitution of its annual jury, I should not be surprised to see the agitation against outside Judges reach its only logical conclusion, viz., the election of members only.

The Copyright Bill now before the House of Lords, and the substance of which was printed in the JOURNAL last week, will, if passed, not leave the photographer any worse off than he is at present. Copyright is limited to thirty years, and registration in some circumstances is compulsory; otherwise the present Act is not very materially departed from. The Bill, indeed, interferes so little with photographic copyright, that it is probably best left as it is, except, perhaps, in some matters of detail. It will be noticed that a distinction is drawn between photographs and works of fine art. This distinction probably owes its existence to the Royal Academy. Surely it is a little undignified for photographers, after this, to go hat in hand to members of the latter body, and ask them to sit in judgment on productions which, according to this Bill, do not even come under the classification of "other artistic work!"

Only five weeks separate us from the Gloucester Convention, the programme of which bears an inviting aspect. The West Country excursions and the proximity of the meeting place to London, the



midlands, and the north, should draw a large crowd to support President Cooke. What it is customary to term a good time is sure to result; personally, I hope that, when all the enjoyment is over, photographers of the "bread and butter" kind will be able to congratulate themselves on having materially profited by their attendance, that is, by an increase of their photographic knowledge. The formal and civic proceedings are bound to be interesting, but in the matter of exhibited photography the Gloucester Convention may not come up to some of its predecessors. There are to be fewer papers than usual. The time has gone by, apparently, when men of the eminence of Joly, Rudolph, Hurter & Driffeld, and others could be induced to address the Convention. Such men doubtless feel that their communications would probably not receive notice at the hands of a holiday crowd! However, here's to Gloucester and all that it is capable of being for and to the members of its Convention!

I am sure that there will be a general agreement in the earnest hope expressed by Lord Crawford (p. 319) that the forthcoming *Conversazione* at the Royal Photographic Society's new premises in Russell-square will be the inauguration of a long and prosperous career for the Society. As one whose efforts, both personally and with the pen, have been freely placed at the Society's disposal for several years past, I look forward with peculiar pleasure to taking a share in bringing about the prosperous state of things which the President hopes for. The hearty co-operation of members, Council, and officers will ensure a flourishing future for the Royal Photographic Society, whose well-wishers could desire nothing so much as that strong and harmonious pull-together without which success in undertakings of this character can rarely be obtained.

Ever since the dark days of 1891, when some of the most powerful members of the Society left it, and for a time it looked as if disaster could not possibly be eliminated from the control of its affairs, the influence and advocacy of this JOURNAL have been cast in its favour. Strange as it may appear now, THE BRITISH JOURNAL OF PHOTOGRAPHY was for a long time the only active friend which the Society had in the photographic press. It may, I believe, fairly be claimed that the support thus freely and continuously given has had not a little to do with the growth in favour with the photographic public which has undoubtedly fallen to the Royal Photographic Society in recent years. There was a time, well within my recollection, when amongst photographers up and down the land the mention of the Society's name was sure to provoke a smile, if nothing worse. To-day the case is different. Its membership is respected, its fellowship is coveted.

Only twelve months ago the Crystal Palace Exhibition, the largest and most important undertaking ever ventured upon by the Royal or any other British photographic society, came to a successful end. It appears to have escaped notice during some recent celebrations that the Exhibition was originally suggested by this JOURNAL, and that for nearly two years before it was held the idea received in these pages an amount of unflinching and strenuous advocacy, without which it is doubtful if the Exhibition could have been brought to a successful issue. But such is the irony of Fate, all the credit goes elsewhere, and so apparently do the thanks and recognitions of a less intangible kind.

I have felt it only right that the support which this JOURNAL has rendered to the Society should be placed on record in view of some recent occurrences from which the quality of gratitude was painfully lacking. Fortunately the recurrence of the events to which I am alluding has been placed beyond the reach of possibility. Were it not so, means would undoubtedly have been taken to remove the cause of complaint. I trust this hint will not be wasted, and I hope the responsible officers of the Society will, in future, not allow its warmest friends and supporters to be treated as some of them were a few months ago.

COSMOS.

## THE GLOUCESTER CONVENTION.

### ARRANGEMENTS.

We append an outline of the arrangements for the forthcoming Meeting of the Photographic Convention of the United Kingdom, to be held at Gloucester July 10-15.

**MONDAY, JULY 10:** *Excursion to Elmore, Fretherne, and Frampton on Severn.*—This excursion has been arranged for the benefit of those Members of Convention who are able to be in Gloucester previous to, or early on the morning of Monday.

Conveyances will leave headquarters at 12 o'clock. Luncheon at the Bell Hotel, Frampton, at 2.30. Tickets (including luncheon), 5s.

*Conversazione.*—The opening conversazione will take place in the Guildhall at 7.30, when the members of Convention will be received by the Mayor, City High Sheriff and members of the Corporation of Gloucester. The Convention will be declared open and the President will deliver his address; Mr. R. Child Bayley will give a "Demonstration of Colour Photography," with a short explanation of the various methods employed; and the programme will conclude with an Exhibition of specially selected lantern slides.

**TUESDAY, JULY 11:** *Excursion to Berkeley Castle.*—The Right Hon. Lord Fitzhardinge has granted special permission for the Convention to visit Berkeley on this date, when the general public will not be admitted, and every opportunity will be given to members to photograph the historically interesting Castle and Church.

Trains leave the Midland Railway Station at 10 and 10.55 a.m., and special carriages will be attached to both trains. Luncheon at the Berkeley Arms Hotel at 2.30. Return Trains leave Berkeley Station at 3.15 and 5.22, arriving at Gloucester at 4 and 6.40 respectively. Tickets (including luncheon), 6s.

At the Guildhall at 8 p.m.—A paper (subject to be announced) followed by an exhibition of lantern slides, by members of the Gloucestershire Photographic Society, of places to be visited during the week.

**WEDNESDAY, JULY 12.**—The Annual General Meeting and Election of the New Council at the Guildhall at 10 o'clock. After the meeting the members will adjourn to the Spa Cricket Field, where the Official Convention group will be taken by Mr. A. H. Pitcher at 12 noon.

At 2 o'clock a visit will be paid to the Cathedral, when the Dean hopes to be able to receive the members and conduct them over the building. The usual visitors' fee, 6d. each, will be charged (N.B.—The visitors' contributions are in aid of the restoration fund).

*Annual Dinner and Smoking Concert.*—At the Bell Hotel (head-quarters, at 7 p.m. Evening dress optional. Tickets (not including wine), 5s. 6d. Ladies are invited to be present at the dinner and concert.

**THURSDAY, JULY 13:** *Excursion to Chepstow, Tintern, and Symonds Yat.*—Trains leave Great Western Railway Station at 9.29 a.m., arriving at Chepstow at 10.20. A special train leaves Chepstow at 12.30, arriving at Tintern at 12.45. Trains leave Tintern at 3.8 and 6.51, arriving at Symonds Yat at 3.52 and 7.36 respectively. Train leaves Symonds Yat at 8.33 arriving at Gloucester at 10 o'clock.

Luncheon at the Beaufort Arms Hotel, Tintern, from 1 o'clock. Tickets (including luncheon and admission to Chepstow Castle and Tintern Abbey), 7s. 6d.

There will be no meeting at the Guildhall on this evening.

**FRIDAY, JULY 14:** *Excursion to Ashleworth, Deerhurst, and Tewkesbury.*—The steamer, *Avonmore*, which has been specially engaged for this excursion, will leave Westgate Bridge at 9.30, calling at Ashleworth and Deerhurst. The time of the departure of the steamer from each place will be posted up at the gangway. Fare, 6s., including luncheon and admission to Saxon Church and Chapel, at Deerhurst, and Tewkesbury Abbey, with permission to photograph at both places.

At the Guildhall, at 8 p.m.—A paper on "Binocular Vision and the Stereoscope," by Mr. Thomas Bedding, F.R.P.S. Followed by an exhibition of specially selected lantern slides.

**SATURDAY, JULY 15.**—Various short Excursions to places in and around Gloucester (as may be required) will be arranged for this day. Among these may be mentioned Highnam, Matson, Hempstead, Cheltenham, Ledbury, Forest of Dean, &c. For particulars see notice boards.

*Bath.*—Should any members desire to visit Bath on their road home, special facilities will be afforded for them to take photographs of the Bath, Roman remains, St. Mary's Abbey Church, &c. Mr. G. F. Powell, 25, Green Park, Bath, a member of Convention, has kindly promised to supply any further information on the subject, and all communications with regard to this matter should be addressed to him.

## IMPORTANT PHOTOGRAPHIC PROBLEMS THAT REQUIRE INVESTIGATION.

(Paper read before the London and Provincial Photographic Association.)

AFTER looking at the marvellous results of modern photographic work, one would almost wonder that there could be such things as any problems requiring investigation.

The speed and quality of our plates, and the perfection to which the manufacturers have brought their printing papers, are such that one can hardly realise that, from a scientific point of view, such a small advance has been made in our knowledge, during the past fifty years, upon such subjects as the action of light in the formation of the photographic



image, or of what that image consists, and the question arises, "Are our photographic societies, especially the parent society, carrying out their duties when they allow such important problems to drift on year after year without, at least, some slight attempt at a systematic organized investigation on a thoroughly scientific basis?"

Of late years an attempt has been made to claim for photography a place among the arts, and to ignore its scientific basis almost entirely by placing the emulsions and printing papers on the same level as the colours of the artists' colourman.

Artists contend, and contend most truly, that photography is not, and never can be, an art. There is as much difference between photography and art as there is between the verbatim reports of our police courts and those marvellous examples of literature in which Sir Walter Scott threw a halo of romance over Scotland and her people. It is true that occasionally the police court will give us a character that, for true nobility and grandeur, the novelist cannot equal. So the camera will now and then produce an effect of light and shade that no artist could ever compete with, but in both cases the bulk of the pictures of life from the police courts and the representation of nature in our photographs have too heavy shadows.

Art is nothing more than dreamland, and an artist is a man who reproduces in his waking moments not what he really sees, but what it appears in the fantastic dreams of his imagination. But photography has done a great work by dragging art out of the sea of falsehood in which it was engulfed in the past. Before the days of photography few people really used their eyes, they accepted the artist's false drawing as correct; but directly the photograph began to teach the world the true representation of form then began a silent revolution in the art world, and there is no doubt that, from an educational point of view, photography has done a great work, because it has not only taught the artist correct drawing, but it has trained every one, from the Board-school child upwards, to use their eyes, and detect the difference between the true and the false in the representation of form.

We will now look at photography from a more scientific standpoint, and, first, as to "light" itself in connexion with its action on the photographic plate according to the absorption theory of light. In passing through a transparent medium, the molecules of the latter take up the waves of certain periods, and the remainder pass through, giving the colour of the medium. Now, if we take a plate coated with a slow emulsion (one that used to give a good ruby colour in our old emulsion-making days), one can understand that the blue and more actinic rays taken up or absorbed in the film have been converted into the light action that has taken place on the particles of silver bromide, and that the slow vibrations are allowed to pass through, thus giving the ruby colour transmitted through the film. In this case theory seems supported by practice; but how about a rapid emulsion that transmits blue rays? The molecules of this film have taken up the waves of the slow period, and yet we obtain a much greater speed of plate, although the more rapid vibrations of the blue or actinic rays have passed through the film. How can we explain these slow vibrations, absorbed or taken up in the film, acting more rapidly on the particles of silver bromide?

When we photograph the spectrum, we have even greater difficulties to explain. If we throw a spectrum on a screen, and look at the blue portion through a piece of blue glass, we find that the glass stops those rays very little, in other words, it is transparent to them. And yet we know that, if we take a rapid plate which transmits blue rays, the blue rays in the spectrum to which the plate ought to be most transparent have been most active in their action on the silver bromide particles. Some one may say that it is because their action is based on a similar law of vibration to that of a tuning fork, which will communicate its vibrations to another of the same note. But, if that is so, why do not the red rays of the spectrum act more strongly on a slow film transmitting red or ruby rays than those at the blue end of the spectrum? I think you will agree with me that we have here a problem requiring investigation.

I now come to the question of the action of light on chloride of silver, on which are based our printing-out processes. The first thing we want to know is, of what does this photographic image consist? If we take some pure chloride of silver with a proper excess of silver nitrate, and expose it to light, we will find that it will assume a slate-blue tone and refuse to bronze; and, if it is treated with hyposulphite of soda, it will be almost entirely dissolved away. So our photographic image is not metallic silver from the reduced chloride of silver, indeed the only part the chloride seems to play is that of an accelerator in the formation of the image.

But, if we add some organic matter to the chloride of silver and expose it to light, we shall find that it darkens usually to a dark-brown hue, and then becomes bronzed, which colour is comparatively unaffected after fixing. This shows that the image consists of silver combined with coloured organic matter. We now want to find out how much silver there is in this compound.

I think the best way to do this is to take a sheet of albumenised paper, and, on sensitising it, we shall find that it will take up about twenty-eight grains of nitrate of silver. We will then expose it to light until it darkens all over to just short of the bronzing stage. Then, if we treat it as an ordinary albumenised paper print, we shall find in the washing

waters about 14 or 15 grains of the silver, in the fixing bath another 10 grains or so, in the washing water after fixing about 2 grains, and in that blackened sheet of paper measuring 23 x 17 inches there will be barely a grain of silver left in the deposit.

That being so, can we call it a silver image at all? The fact appears to be that it is coloured organic matter produced by the action of light on the silver in which it had previously been in combination; and that, after the formation of that coloured deposit, about 97 per cent. of the silver can be removed, although the whole 100 per cent. was necessary to produce it. If this is so, the next question is, What is the action of the gold of the toning bath? Is the gold simply deposited on the organic matter forming the image, or does it keep some of the silver from being removed in the hypo bath?—in other words, is the greater permanence of a gold-toned print due not only to the presence of the gold deposit, but to a locking-up (so to speak) of some of the silver as well? I think this is probably the case, and that some of the sub-chloride of silver is formed into an insoluble hyposulphite of silver, which is not redissolved in the excess of hyposulphite of soda in the fixing bath.

I think the following experiment will show this. If we allow sulphuretted hydrogen to act on a print, it will at first slightly darken the image until the bleaching of the organic matter commences. This same darkening action by sulphuretted hydrogen takes place on sub-chloride of silver that has been treated with hyposulphite of soda.

As far as the permanence of the image is concerned, this extra silver is of course an advantage, but, unfortunately, I have found that the yellowing of the whites in old albumen prints is, in many cases, due to their having been in a toning bath. The gold prevents the whole of the silver being removed by the hypo from the white parts of the print, and the sulphuretted hydrogen in the atmosphere slowly converts this silver into a yellow sulphide. If you will make the following experiment, you will find that this is so. Take two pieces of sensitised albumen paper, and, without any exposure to light, wash them to remove the free silver nitrate. Then soak one piece in a toning bath for ten minutes, then fix and wash both pieces in the usual way. Now, if you expose those two pieces of paper to the action of sulphuretted hydrogen, you will find that on the one that has been in the toning bath there is a formation of yellow sulphide of silver, showing that the gold had prevented some of the silver being fixed out in the hypo bath, whereas the one that had not been in the toning bath has kept its purity of colour.

We often see in the text-books that it is best to tone before fixing; but if the gold prevents the whole of the silver being removed from the whites of the print, and is the cause of the faded yellow photographs we so often see, would it not be better to fix first, to remove the silver, before depositing the gold on the image?

I need hardly point out what an important matter this is to the professional photographer, and what is required is for somebody (say the London and Provincial Photographic Association) to start a regular systematic and scientific investigation into the whole subject; because, after all to get the best results, we must have a printing-out process.

Photographs by blind processes requiring development, or semi-blind like platinum, are very fine when everything is just right. But the waste of material is, and must be something enormous, for the professional man to turn out only the very best work.

So far I have only spoken about light and the visible photographic image. I now come to the subject of the latent image requiring development. We will take the old wet-plate negative first. Here we have a collodion film, mainly on the surface of which are particles of bromide and iodide of silver, with an excess of free silver nitrate. After exposure to light, development causes a building up from the free silver nitrate of an image upon the particles of silver bromide which have been acted upon by light. It seems to me that the sub-bromide theory explains this action very well, although even in this case we find that the physical characteristics of the film have an important bearing on the speed of the plate, the high or low-temperature cotton, and the amount of alcohol used in the collodion, all having a controlling action.

But, when we come to consider the dry plate with alkaline development, all the old theories are topsy-turvy directly. Everything is on an entirely new basis. So far as the particles of washed silver bromide are concerned, the alkaline developer will reduce those which have not been acted upon by light as rapidly and perfectly as those which have been. Then we have to explain reversal of the latent image. It is of no use guessing that the action of light is a chemical, a physical, or an electrical one, unless we can explain reversal as a natural sequence. We have to explain, first, a latent negative image, then a latent positive one, then a visible negative deposit. We have here no building up of an image from the silver in other parts of the film. Every particle of washed silver bromide imbedded in the film of gelatine or collodion has to act on its own account. It has first to be bound up or protected from the action of the developer by the film. If it were not for this protection by the gelatine, dry-plate photography would be an impossibility with alkaline development.

What the actual momentary action of light on a particle of silver bromide is it is almost impossible to say. All we can really say is that, by some means, the protective property of the gelatine over it has been destroyed, and the developer is able to reduce it. As many of you



know, my own impression is that there has been a vibration of the atoms of bromine and silver sufficient to destroy the protection of the gelatine surrounding them, but not sufficient to free the bromine.

If the light action is continued, we obtain reversal, i.e., something has occurred to again prevent the developer reducing that particle of silver bromide to a metallic state. It is no longer a question of the physical protection of the gelatine, that has already been destroyed. What I believe does take place is a chemical action, viz., a reduction of the particle to a sub-bromide. The over-exposure to light, producing a continued vibration of the atoms, has caused the liberation of the bromine, which combines with the gelatine immediately surrounding the atoms of silver, and then this bromine acts as chemical restrainer or protector against the reducing action of the small amount of the developer that is able to soak into the film; and thus we obtain reversal. Of course, the reason we cannot get the amount of density on an over-exposed plate is because there has been a reversal of some of the particles of silver bromide. The silver is in the film to be reduced to a metallic state, if we could only clear the free or liberated bromine out.

There are a great number of other problems requiring investigation, but I will only refer to one which may be taken up by those who are interested in the pictorial aspect of photography rather than the chemical.

Although photography can never be an art, it does not follow for one moment that it will not produce a pleasing, and even artistic, representation of nature. I do not mean the miserable, dull, gloomy, depressing examples found in our exhibitions during the last few years. For instance, the Salon would make a most suitable meeting-room for a club of undertakers—that is, if the average type of female beauty exhibited in the portraits did not scare the members away. To see these exhibitions, one would think there was no such thing as light and sunshine. What we want, for a change, are pictures with a mass of light half-tones, and with only a few intense shadows to give brilliancy. Most photographs suffer through the darker half-tones being too heavy. The best way I can see at present to get over the difficulty is to develop only to that point where the deepest shadows in the negative would remain clear glass when fixed, and then intensify the image heavily. What we want is to raise the scale of half-tones in the print away from the deepest shadows.

HERBERT S. STARNES.

#### ORTHOCHROMATIC PHOTOGRAPHY: A SIMPLE EXPLANATION.

If we examine the spectrum of white light and make a curve showing the luminosities, or eye values of the various parts of the spectrum (as, for instance, Captain Abney has done), we shall see how a perfect photographic plate should behave. Except for special purposes, we require for pictorial work plates which will photograph what the eye sees and nothing else, and they should give densities of image the opacities of which are proportional to the light intensities of the object as they appear to the eye, no matter what the colours may be. The curve of sensitiveness of an ordinary dry plate to the spectrum of white light, compared with the luminosity curve of the same spectrum, shows a difference so astounding that at first we wonder how photography can give any representation worthy of the name at all; indeed, were it not for the considerable amount of white light reflected by nearly all coloured surfaces, the use of photography for pictorial representation would be scarcely possible; nevertheless, the want of orthochromatism, or luminosity sensitiveness, is serious in many ways. Ordinary plates do not sufficiently distinguish the luminous value of blue sky from that of white clouds; and the greens and reds of our landscape which predominate in mixtures of white, to define colour, receive no adequate representation on the plate, and by the time the rays which do affect the plate, reflected by the objects of our landscape, have done their work, the skies are "burnt out" with over-exposure. More particularly is the want of orthochromatism felt in photographing close objects, especially those giving brilliant colour effects, because in ordinary portraiture the hideous spotty faces of untouched negatives are mainly due to want of orthochromatism, and the retoucher's art, though sadly abused, becomes a necessity. In photographing flowers or paintings, a brilliant red or bright yellow will often show as a dark patch in the print, while a deep blue will be represented as nearly white, the impression on the plate giving a result quite contrary to that seen by the eye.

All plates are sensitive to the visible rays of the spectrum, but such sensitiveness is widely different from the luminosity curve above referred to; the plate is also sensitive to rays of the spectrum which the eye cannot see, particularly in the ultra-violet. In practice, photographs are taken entirely with the blue, violet, and those ultra-violet rays which the lens will pass; the simple reason is that the ordinary plate is much more sensitive to these rays than it is to those of the green and red, so much so that in photographing the spectrum you may get full density and even considerable halation at the blue or violet part, without any action worth speaking of in the green and red parts. Practically speaking, we are only taking a picture of the blue and ultra-violet rays from the object.

The eye is a poor analyser of colour; if we take bright reflected pigment colour for instance, the spectroscopic will show us all the colours of the spectrum, because pigment colours and those of natural objects are

more or less always impure, but the predominating colour intensities decide the colour estimation.

We may add considerable quantities of white light to any colour giving rays without altering the colour impression, though the eye is very sensitive to the increased luminosity occasioned thereby.

Colour is merely a physiological effect, quite apart from luminosity, though to the eye a certain luminosity is necessary in order to differentiate colour at all; but the same might be said, of course, as regards even seeing anything. It is possible to have any colours of the same luminosity, for instance, a red or yellow may be shaded to the same luminosity as a deep blue; in fact, in light and shade any colour may be of any luminosity within the limits of the light used for illumination. For the same degree of illumination of white light the primaries, red, green, and violet, are, of course, less luminous than their complementary compounds, blue, pink, and yellow, these being double sensation colours as compared with the primaries. It is necessary to mention these facts in order to clearly understand the requirements of orthochromatism.

No so-called orthochromatic plate is or need be colour-sensitive; the popular error on this point is fatal to clear comprehension. It is a question merely of sensitiveness to certain wave-lengths of light; the plate is absolutely colour-blind, or colour-insensitive, but it must be sensitive according to the luminosity of the light, no matter what the colour may be. Suppose we have a red light of ten luminosity and a green of ten luminosity, the plate under these circumstances must be equally sensitive to both, and for the same exposures give equal densities for both the green and red, simply because the luminosities are equal. The same, of course, applies to any colours. Colour has, therefore, nothing to do with the plate; the fact that certain wave-lengths of light are red, green, or violet, to the eye is a mere physiological condition.

From this we can see that colour contrast can never be rendered in monochrome. Many artists of ability talk nonsense when they say that it can. Suppose in a picture we have a red and a blue of equal luminous intensity side by side, which are you going to represent in monochrome as lighter or darker, considering that the luminosities are actually the same? The artist will tell you that you must differentiate, but, if you alter the luminosities, your balance of light and shade is no longer the same as in the original; and this, unfortunately, applies to the whole of the picture. It is clear that, unless the relative spectrum sensitiveness of the plate can be brought in accord with the relative spectrum luminosity to the eye, any attempt to correctly reproduce light and shade is hopeless. In copying works of art in which coloured light and shade have to be represented in monochrome or black and white, it surely is clear that, as reproduction in colour is denied us, light and shade are all that is left. We can at least reproduce them, but, if we attempt to delude ourselves into the idea that colour simply can be represented by alterations in luminosity, we end in producing a result which neither renders colour nor light and shade as in the original. Every coloured picture consists of two different contrasts—those of colour, and those of light and shade; if we take away the colour contrasts, we have the light and shade contrasts left, which can still be faithfully rendered. In speaking of light and shade contrast we mean both the light and shade of natural objects and the representation of light and shade by the pigments of the artist. The whole matter resolves itself merely into the correct rendering of luminosities quite apart from colour.

It is probable that the false idea that colour contrasts may be represented by luminosity contrasts has arisen through the meagre education the artist usually has on "light," and one of the first things he does is to compare the luminosities of the various parts of the spectrum of white light, and as the result sets out the order of luminosities of the various colours. This would be all right were there no such thing as shade. When we have, as is always the case, the complex conditions of colour contrasts together with light and shade contrasts to deal with, it is easy to see that it is not only possible for any two colours to have the same luminosity, but that the order of spectrum luminosity may be actually reversed. A shaded yellow may have less luminosity than a better lighted blue or violet, and so on. In consequence, if we wish to preserve the light and shade contrasts of the original, the question of colour contrast must be set aside if our rendering be in monochrome or black and white. If we attempt to reproduce both colour and light and shade contrasts, we attempt an impossibility and get neither, unless, of course, we print in colours. This brings us back to our statement that colour contrasts cannot be rendered in monochrome or black and white, and therefore, if we give up colour, we may still render correctly light and shade.

It is fortunate that the complex mixtures of light forming our pictures of nature and paintings enable us to effect a compromise to overcome the imperfections of the plates and screens. For instance, if we photograph the spectrum with both plate and light-filter, we at once see the theoretical faults of both, while the rendering of pictorial work may be sufficiently good to entirely satisfy the eye, owing to mixtures of light making the errors fractional. To those who scorn the aid of the spectro-scope, and there are many such, we would say, When you can photograph the visible spectrum perfectly, you can photograph everything perfectly also, that the eye can see.

Once more we would urge every one to remember the simple fact that colour contrast is totally different to light and shade contrast.



These remarks are necessary because certain firms who photograph paintings say that they will not be able to use correctly screened plates. Fatal mistake! If your plate be not truly luminosity-correct, the harmonious rendering of light and shade of the original will be lost, and the result will be blotchy and untrue.

How far have we advanced in the twenty-six years which have elapsed since Vogel's discovery? Until recently, not very far. The progress of scientific photography must necessarily be slow, as some of the most difficult problems of chemistry and physics have to be dealt with; indeed, it is most galling to the photographic chemist to find how little he knows of the chemical and physical conditions of the materials he uses.

We are still very far from perfection as regards orthochromatic plates. Excepting for representation in colour by the various colour printing processes, no plate, with any pretension to perfect representation of luminosities of whatever colour, should require a light-filter at all. A plate should be sensitive only to the visible rays, and proportionally render the intensities or luminosities of such rays without any regard to colour. Unfortunately, up to the present, no method of sensitising films or emulsions will raise the sensitiveness of the green and red portions of the spectrum sufficiently to equal the light action relatively to luminosity of the blue and violet portions, so we have to use light-filters to cut out the useless ultra-violet, and tone down the blue and violet and various amounts of the green or red, as the case may be, to counteract the imperfection of the plate and compel it to render all luminosities proportionate to their intensities.

JAMES CADETT.

## PRACTICAL NOTES ON SOME IRON PRINTING PROCESSES.

### PART IV.—BLACK-LINE PROCESS (*Ink Process*).

#### *Ferro-gallic Process.*

THE credit of originating this process is generally given to Poitevin, who made a public communication in 1859. In 1880 Riegel published a formula, in 1883 Colas gave another. Shewcross and Thompson, in 1885, took out a patent for a paper of this character. Senzig and Mellis have also made communications on the subject.

The general outline of the process may be compared with that known as Pellet's, with the conspicuous difference that gallic acid is now used (in place of potassium ferrocyanide) for development. The ferro-gallic or black-line process is sometimes called the ink process, but this latter term is preferably applied to a somewhat different printing method described in the next chapter.

The general opinion seems to indicate that the strength of the developer should be adjusted to the proportions of sensitising materials; therefore it will be more convenient to have the coating and developing formulae side by side.

#### A.

1. Ten per cent. solution of gelatine.

#### B.

Ferrous sulphate.....	20 parts.
Tartaric acid .....	40 "
Ferric chloride .....	45 "
Water .....	400 "

Mix while warm, and coat the paper at once.

#### *Developer.*

Oxalic acid .....	1 part.
Gallic acid .....	7 parts.
Water .....	1000 "

2. A.—Soak 35 grains of gelatine in 1 ounce of cold water until quite soft. Then dissolve by placing the containing vessel in a dish of warm water.

B.—Of tartaric acid, ferric chloride, and ferrous sulphate take 20 grains of each, and dissolve in 1 ounce of warm water.

Mix A and B while warm, and apply at once.

#### *Developer.*

Oxalic acid .....	20 grains.
Gallic acid .....	100 "
Water .....	1½ pints.

3. A.—Dissolve 150 grains of gelatine in 4 ounces of water.

#### B.

Iron protosulphate .....	150 grains.
Tartaric acid .....	150 "
Iron perchloride .....	300 "
Water .....	7 ounces.

Mix and coat the paper.

Develop with—

Oxalic acid .....	20 grains.
Gallic acid .....	120 "
Water .....	40 ounces.

4. Zinc sulphate.....	5 parts.
Tartaric acid .....	5 "
Ferric chloride .....	12 "
Gelatine .....	5 "
Water .....	25 "

#### *Developer.*

Gallic acid .....	5 parts.
Methylated spirit .....	50 "
Water .....	300 "

5. Ferrous oxalate.....	10 parts.
Tartaric acid .....	20 "
Ferric chloride .....	30 "
Water .....	240 "

Mix this with an equal quantity of a ten per cent. solution of gelatine.

#### *Developer.*

Oxalic acid.....	1 part.
Gallic acid .....	8 parts.
Water .....	1000 "

6. Iron persulphate .....	10 parts.
Tartaric acid .....	10 "
Gelatine .....	10 "
Ferric chloride .....	20 "
Water .....	300 "

#### *Developer.*

Gallic acid .....	20 parts.
Alcohol .....	200 "
Water .....	1000 "

### HELIOGRAPHIC PROCESS OF FISCH.

#### A.

7. Iron persulphate .....	8 parts.
Water .....	20 "

#### B.

Tartaric acid .....	5 parts.
Water .....	50 "

#### C.

Gum arabic .....	5 parts.
Water .....	50 "

Add A to B, then add C, stirring well.

Then add 10 parts of saturated solution (45 Beaumé) ferric chloride.

#### *Developer.*

Oxalic acid .....	1 part.
Tannic acid .....	20 parts.
Water .....	1000 "

The sensitising solution keeps for some time if stored in the dark.

### 8. NAKAHARA'S PROCESS:—

Gum arabic .....	15 parts.
Water .....	110 "
Tartaric acid .....	2 "
Sodium chloride .....	9 "
Iron sulphate .....	10 "
„ perchloride .....	15 "

*Developer.*—A plain aqueous solution of gallic acid; the exact strength is not of much consequence. If it be too strong, or the prints are left in it too long, the paper becomes stained.

For this process a highly sized paper is recommended. The sensitising preparation should be mixed in the order given above. The paper should be evenly coated and quickly dried. After development the washing should be quickly and thoroughly done.

*The Paper.*—Firm and highly sized paper is the best. Hard drawing paper—Saxe, Reeve, &c.—may be used. Sizing may be done with insoluble gelatine, arrowroot, &c. The less porous the paper, the brighter is the result.

*Coating.*—The paper may be floated, or preferably coated, by using a Blanchard or Buckle's brush, or a soft, clean sponge, &c. Evenness of coating is of importance. Quick drying is also highly desirable. The following plan is strongly recommended for large sheets of paper: Using a clean sponge, thoroughly damp one side of the paper evenly all over. Allow a short time for the surface to get thoroughly wet, then wring out the sponge as dry as possible, and with it remove all the fluid possible from the surface of the paper. The paper must, of course, be dried in the dark and stored in a dry place. It will keep fairly good for about a fortnight.

*Printing and Exposure.*—The paper has a greenish-yellow appearance. The action of light removes the colour, so the design is white on yellow ground. The exposure varies with the make of paper and sensitising solution. An average exposure in good sunlight would be about ten or fifteen minutes.



To render the visible effect of printing more conspicuous, you may add to the sensitising solution a small quantity of a saturated solution of potassium sulphocyanide. This gives the paper a red colour, and, as this colour bleaches out on printing, the contrast of printed and non-printed parts is accentuated. Some workers suggest that a small negative of about the same strength be put out side by side with a large one, and that the test strips be withdrawn from time to time from the small test negative, and that these test strips be brushed over with potassium sulphocyanide solution, which will indicate how far the printing has proceeded.

Under-exposure is indicated when the paper under the clear part of the picture is tinted in development. Over-exposure is indicated when the parts under the dense portions of the positive (or transparency) are broken up or granular. Ferrogallic paper is not usually so quick printing as the Pellet paper, but is quicker than the ferropurssiate paper.

Development is done either by floating the print face down or immersing it. Prolonged action of the developer is apt to stain the whites of the paper, especially if the printing has not been thorough. Some workers develop with gallic acid—a weak solution, to which is added a small quantity of alum.

After development, the print requires very thorough washing. Place between clean blotting-paper and dry. (If the paper is not blotted fairly dry, the lines may run.)

The first washing water after development should be slightly acidulated with oxalic or sulphuric acid.

REV. F. C. LAMBERT.

### THE NEW SEASON.

EASTER is usually about the commencement of the photographic season, when apparatus is overhauled and put on trial for the anticipated work we each, after our own fancy, have elected to pursue. Most photographers have pet subjects of some class, in which they succeed better than with another; but, whatever it may be, sunny, genial weather conduces to its better performance than do the chill blasts and grey skies of winter. That photography, to be enjoyed, must be practised in quiet, pleasant weather, is pretty generally allowed. Although some enthusiasts profess a liking for stormy seasons and grey days, they form a decided minority.

We generally formulate some programme as to what we will do early in the season, to be more or less modified according to the vagaries of this tantalising climate. For my own part, I may say that, if I fix on some special subject for some special time, it rarely comes off according to programme. There is, however, a class of photography that may be fairly well arranged for in advance, and that is interior work. Fortunately, the early spring months, before the attractions of foliage make one long for work in the open air, are the best for it, the light in March, April, and May being far better than later on in the summer, although this is much less important now than in the days of wet collodion, when the best light procurable was a *sine-quid-non*; but even now a good and proper light will be found to produce much the best quality of negative, although there may perhaps be as much detail in one taken in a poor light as the other. A good light gives a creamy richness that makes a good printing negative that a poor light fails to do; the development also goes smoother and nicer than when shadow detail seems tardy in showing itself. Interiors which have to be taken in cold spring weather, of churches and suchlike places, are subject to a special annoyance in the form of smoke from the warming apparatus, which very often fills the building with a haze that renders a good photograph impossible; the worse the light the more influence the haze has, as may be readily imagined, reducing the contrasts very considerably.

To get a good negative of an interior it is imperative that haze shall be absent, whatever the cause of its presence may be. In very dry weather a haze is often caused by cleaning and dusting operations, which are of periodical occurrence in most buildings frequented by the public. A little inquiry beforehand will indicate which days are most likely to be free from the trouble, and we can make our arrangements accordingly. The air being generally moister in the spring months lessens this grievance, and for this reason interior work is better done then than in hot, dry weather.

Outdoor work is, however, the kind more generally practised in summer time, when not only photographs can be taken, but the scenery enjoyed and our health improved, for, unless the work is strictly professional, it is only indulged in as a pleasant recreation to give variety to a holiday, and as such has everything to recommend it. The display of some speciality at our annual exhibitions that has attracted favourable attention has probably some considerable influence in deciding us on the class of photograph we will try to make; but, in doing this, it is all very well to try for a *similar effect*, but not to make a *similar picture*. Slavish copying of other people's work is to be altogether reprehended. Let the individuality of the worker be shown in his work. The hazy, out-of-focus pictures we have been inundated with of late years, because one or two clever pictures were produced by clever men, who knew how to produce pictorial effect and adopted the particular treatment to gain it, caused many to copy the style, but utterly fail to secure artistic effect, with the result of flooding the exhibitions with meaningless rubbish. I

fancy, however, this craze has somewhat subsided, and in the future we shall have photographs that will not only be pictures, but show how our opticians have worked to permit us to make them. Not by any means that I am an advocate for photographs made to show off what an instrument can do in a purely technical sense, for its powers should be utilised without in any way distracting the attention from the picture formed by its aid. *Ars celare artem* is an axiom as good in photography as anything else, for very often those who are so scrupulous about technicalities fail to make pictures; but, when the two qualities are combined—good technical skill and artistic ability—we may safely expect a photograph, in every sense of the word, above the average.

Of all unsuitable media photography is perhaps the most so for the production of impressionistic work as it is termed; the very character of a photograph is the perfect antithesis to anything of the kind, and to produce a result of this sort worthy a passing glance is a mere matter of accident, a thing not to be repeated at will and of very questionable advantage at the best, accident or not. Like many other matters, we rush from one extreme to the other, in this case from microscopic definition to none at all. Perhaps, having reached the extreme of fuzziness, we may oscillate back to our original ideas of photography; but, with the advanced knowledge of art, the probability is we may stop at the happy medium and produce pictures that will not provoke hostile criticism for one quality or the other, at any rate it is to be hoped so.

A great many conditions that our opticians have succeeded in mastering in the construction of a high-class lens are but occasionally required in ordinary outdoor work, but that they are available when they are required is an unmistakable advantage. A good single lens is not to be beaten for the usual landscape work; the photographer provided with several of this kind, of different foci, there is very little outdoor work closed to him. Of course, for architectural pictures rectilinear lenses are necessary; but even such subjects as these, provided the lens is worked well within its full capabilities, can be correctly rendered by the single lens. In some compositions a lens giving a perfectly flat field is less useful than one not so accurately adjusted, and will render an arrangement of material in a concave form, so to say, better, with a larger stop than the other with a flatter field. Single lenses are, however, limited in their usefulness, as a row of buildings, say, the one side of a street, taken from the other side, would show a distinct curvature of the horizontal lines, although the vertical ones, being shorter, would not be noticeably distorted unless they completely filled the plate. Of course, the more broken and varied the lines of a building, the less a slight curvature shows. The photographer must therefore use discretion in his selection, and by doing this many pictures may be taken creditably with the single lens that might be thought to be beyond its capabilities. Very few, if any, ordinary landscapes require microscopic definition, the time when such definition is perhaps an advantage is in small work for lantern slides or when an enlargement of some kind is needed. I am under the impression that the many refinements of our best modern lenses are but indifferently appreciated by the majority of landscape photographers, who are mostly satisfied if they get a crisp, bright picture, including the amount of subject they require.

It is worth while to turn our attention to special effects of lighting, by which many otherwise unattractive scenes are rendered beautiful. Perhaps the most striking effects are seen when the sun is directly in front of the camera, tipping all intervening objects with outlines of light. To be able to notice and appreciate the effect, we must shield our eyes from the direct rays of the sun, and it goes without saying we must protect the lens in the same way, or the result will probably be fog and flatness. Given, however, a good subject, and exercising care, our picture should be exceptionally attractive. Some of the most, to me, pleasing pictures I have seen were taken with this style of lighting, and I can honestly recommend it to any on the look-out for artistic effects. With this particular style of illumination, dust makes itself obnoxious as atmospheric haze, and in dry summer weather often forms an utter nuisance, not only with this but other styles of lighting, especially in the neighbourhood of much-frequented thoroughfares. The amount of dust raised by a rapidly driven vehicle will often stop photography for some little time. I have before now had to give up a subject for no other reason, as the frequent passing of vehicles did not allow the dust to subside sufficiently to get clear shadows.

Negatives taken during a shower, so long as the lens itself is protected from the rain, are often surprisingly clear, much more so than might have been anticipated. In showery weather the light is at its best; all the obstructive dust particles are washed out of the atmosphere, much to the advantage of the photographer. It is not advisable, in a general way, to make an exposure *directly* after a shower, as the beads of moisture on different surfaces reflect the light and produce spottiness. As soon, however, as this has dried off, things are in as good condition as they can be expected to be. This applies especially to roadside studies of flowers and foliage, mixed with stones and earth, which, being damp, harmonise in colour better than when quite dry; in limestone districts this is very observable. Water, than which there is nothing better to give effect to a picture, should be taken at such an angle that will avoid that blank, white look it sometimes has when taken from an improper standpoint, the camera being too high or too low, as the case may be. By all means get the reflections of surrounding objects in it, not cut out



so that there is some difficulty in telling the right way up of the picture, but sufficiently distinct to make good even lights and shadows, and suggest the rest. A slight undulation of the surface will give much more depth and limpidity to water than perfect quiet at any time, whereas a sharp gust of wind will entirely destroy the liquid effect, and make it look more like a chalk road than anything else I can think of.

In searching for views, it frequently happens that the most picturesque will be found along the course of rivers and in valleys rather than in the higher grounds. Of course, good pictures may be found in either, but the valley is more prolific in subject-matter than the hills, for land rising towards the distance helps somewhat to modify that dwarfing effect we find when working on level or from higher ground. Again, the time of day is of considerable importance in securing effect. Midday seldom produces such artistic pictures as earlier or later, especially in the height of summer, when lengthy shadows often help the composition most materially with variety of forms that are entirely absent with the more vertical lighting of a midday sun.

Too great stress cannot be put on the importance of suitable lighting; definition is quite secondary to it. A cleverly lighted picture will invariably give a favourable impression, even if the composition and definition leave much to be desired. It is the general effect of chiaroscuro that first attracts, and afterwards the detail. If, however, the light and shade are badly managed, the definition and form, however excellent, never satisfy, and the more the picture is looked at the more is the deficiency felt. It may not always be easy to say why a picture fails to please, but, nine cases out of ten, it is because of the bad management of the light. If the composition is inartistic, or if the definition leaves much to be desired, there is no difficulty in seeing it, and we know the cause of offence; but there is more subtlety about lighting, and one cannot always say off-hand the exact reason a photograph displeases us. I would therefore impress on all photographers to be especially careful in lighting their pictures, and time spent over this is seldom barren of result.

The foreground, being nearest the eye, merits very careful attention, and a thoroughly good, well-arranged foreground goes a long way to give character to the picture. It should never be plain and uninteresting if it is possible to prevent it. If the natural arrangement is deficient in form, extraneous objects can often be introduced to make up the deficiency. In doing this, incongruity must be avoided, and whatever is brought and placed must be in such position that it might naturally have assumed. If no care is taken in this respect, the evident make-up will undoubtedly spoil the effect, and instead of proving a help will be just the contrary. So long as a nice effective bit of light and shade is introduced, we shall have succeeded in gaining our ends, and turned our uninteresting patch into something that is grateful to the eye and helpful to the composition of the picture.

From the foregoing article it will be gathered that the writer wishes to emphasise the fact that one well-thought-out photograph is worth many taken hap-hazard; that a photographer should set out with some definite ideas as to the pictures he will endeavour to secure, and not make his exposures in an indiscriminate, happy-go-lucky sort of way, to only find out, on development, that if so-and-so had been a little different, which it might easily have been, it would have turned out a success instead of a failure; the result would be fewer exposures and more pictures.

EDWARD DUNMORE.

#### MERCIER'S IMPROVEMENTS IN THE PREPARATION OF ARGENTIFEROUS SENSITIVE SURFACES FOR PHOTOGRAPHIC PURPOSES.

M. MERCIER states that his invention relates to the preparation of argentiferous sensitive surfaces capable of bearing a longer exposure to the light than heretofore, such surfaces—whether under the form of plates, paper, or films, and whether utilised for positives or negatives—producing photographic images by the aid of suitable developing means. A further object of the invention is to obtain more vivid images than heretofore when the exposure has been inaccurate, and especially when it has lasted too long. The invention consists in adding to the emulsion of argentiferous salts one or more chemicals, which he classifies under the headings or groups, A and B, the latter comprising two subdivisions each.

"Group A comprises:—

"1. Antimonial salts mixed with an organic salt, such as a citrate or a tartrate. I use, preferably, tartar emetic, *i.e.*, tartrate of antimony and potash.

"2. Morphia, codein, their salts and derivatives. To utilise the substances belonging to this group A, I prepare a solution containing from 1 to 3 grammes of the substance selected per 100 grammes of water, and I immerse therein the sensitive surfaces or film for a period of about two minutes, after which the same is violently shaken in order to expel the excess of liquid, which would otherwise produce stains, and is finally allowed to dry. This treatment is preferably carried out before exposure. It may, however, also take place after exposure, but it must always precede the developing stage.

The developing means used should preferably contain hydroquinone mixed with sulphite and carbonate of soda, to which I add a small

quantity of an alkaline bromide, such as usually practised when the exposure has lasted too long.

"Group B comprises:—

"1. The active substances forming the base of alkaline developing means, such as hydroquinone, metol, ortol, amidol, pyrogallol acid, para-amidophenol, pyrocatechin, glycin, resorcin, and the like, to which may be added apomorphia, apocodein, and eserine or physostigmin; these substances being kept in their normal or unoxidised state by the addition of a small quantity of an acid, such as acetic acid, or of an alkaline sulphite.

"I am aware that several of the substances hereinbefore mentioned have already been used in addition to the argentiferous emulsion for photographic sensitive plates; but in such cases this addition had not for its object to aid in the development of the image when the exposure had not been very accurate, and when using a suitable developing means such as that having a hydroquinone base, and containing bromide, whilst the addition of such substances to the sensitive surfaces was effected without any acid or alkaline sulphite.

"In utilising the above substances, I may proceed as for those of group A, but it is preferable to use weaker solutions containing only about 10 centigrammes of one of these active substances and 1 to 2 grammes of acetic acid or 1 to 2 grammes of sulphite of soda per 100 grammes of water.

"The substances mentioned in the above paragraph in an oxidised state and in smaller doses. Such substances have not been used before in an oxidised state in which they are highly active and thus allow of a more prolonged exposure to the light. To obtain these substances in an oxidised state, they are merely dissolved in water with or without the addition of a few drops of an alkaline substance, such as ammonia or a concentrated solution of carbonate of soda, and the solution is exposed to the air until it is strongly coloured. Thus good results are obtained with amidol which is readily oxidised when using a solution containing 1 centigramme of this substance per 100 grammes of water and with which the sensitive plates are treated in the manner indicated for group A. Sensitive plates thus treated may give utilisable photographs even after an exposure to light one thousand times too prolonged, when the same are developed with the means hereunder mentioned.

"With reference to groups A and B, rapid developing means, such as those based on amidol or containing caustic alkalies, do not yield good results when the exposure to the light has lasted too long. The following formula is the best for developing purposes:—

Hydroquinone.....	10 grammes.
Sulphate of soda .....	60 "
Carbonate of soda .....	60 "
Bromide of potassium .....	5 "
Distilled water .....	9.8 to make up one litre.

"Instead of using—in the treatment hereinbefore set forth—sensitive plates, paper or films prepared beforehand, *i.e.*, such as found in commerce and of immersing them in the solution of the substances aforesaid, I may add the said substances to the argentiferous solution directly, *i.e.*, before spreading the same over a glass plate, a paper sheet or a film."

#### LEHMANN'S PLATE AND PRINT-WASHER.

THE invention consists in an apparatus which, when placed under a tap, allows a continuous flow of water over each plate separately, thereby removing and carrying off the hyposulphite of soda silver from the film of the plates or prints in a very quick manner, without any of the contaminated water coming again in contact with the plates or prints.

The apparatus is entirely constructed of zinc, and is composed of a tank, *a*, trays, *c*, and a receiver, *f*.

The tank may be narrow at one side, but the other side must be a little broader than the sides of the plates for which it is intended; the height varies according to the number of plates to be washed at a time.

In the broad side of the tank are horizontal lines, or groups, of small holes, the position of which is shown in fig. 2 by an arrow, and a little below each line of perforations is fixed one end of a tray, *c*, for holding the plates in a right angle to the tank, but preferably with a slight downward inclination.

At the opposite end of each tray one or more spaces, *d*, are cut out of the rim, with the double object of allowing the plate to be lifted, and also as an outlet for the water from the tray.

The trays are connected and supported at the sides by upright stays, *e*, and the apparatus is placed or fixed in a large tray, *f*, which serves as a receiver of the waste water, and has an outlet, *g*.

A strip of zinc, *b*, is attached on one side to the tank a little above each line of perforations, while the other side reaches down obliquely to within  $\frac{1}{2}$  inch from the bottom of each tray; see fig. 2.

After developing and fixing photographic plates, the latter are laid face upwards in the trays of the apparatus, which is then placed under a tap, so that water can pour into the tank. The fine jets of water issuing from the perforations are broken by the strips, *b*, and form into homogeneous sheets which flow over the plates and through the openings, *d*, into the receiver, *f*, whence the collected water is carried away through the outlet,



*g*. The water supply from the tap is regulated so that the tank remains always full to the top.

The apparatus is chiefly intended for washing negatives or other plates, but it may also be adapted for photographic paper prints.

For this purpose carriers (fig. 8), made of perforated zinc plates, bordered on both sides, but not at the ends, by narrow strips of zinc, *h*, of at least  $\frac{1}{2}$  inch depth, are used. These carriers must fit loosely in the trays, so that only the borders, *h*, rest on the bottom. The prints, *i*, are laid face upwards on the carriers, and fastened at the top by means of small clamps, *k*, as shown in fig. 3, or by any other suitable contrivance. When placed in the trays the photographs get washed on both sides of the paper by the water flowing underneath and above them.

The following are suitable dimensions for an amateur apparatus for washing six half-plate size negatives:—

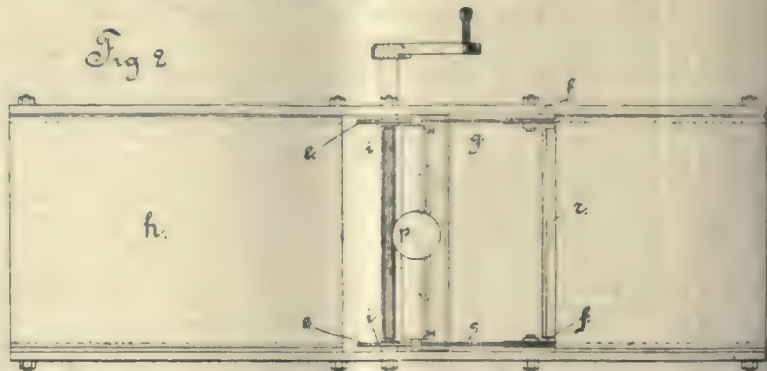
Size of tank,  $10 \times 5 \times 2$  inches; size of trays,  $5 \times 7\frac{1}{2}$  inches, with rims inch high, and two outlets of  $\frac{1}{2}$  inch width. The trays are attached to the tank, with the rim close below the row of perforations, and the breakwater strips  $\frac{1}{2}$  inch above the holes, and reaching obliquely down to about  $\frac{1}{2}$  inch from the bottom of the trays.

The receiver, *f*, can be 12 inches long, with a rim  $1\frac{1}{2}$  inches high.

The perforated lines are 1 inch apart, commencing 3 inches from the

provided at their circumference with soft indiarubber rings, press upon the passing bands, *g*, in order to reduce their rate of motion.

Fig 2



Plate, *h*, extending in its longitudinal direction up to the pulleys, *f, f* (although not shown, for the sake of clearness in the drawings), is provided, directly underneath the mouth of the coating reservoir, *p*, with a transverse slot through which the waste emulsion drains away into the

Fig 1

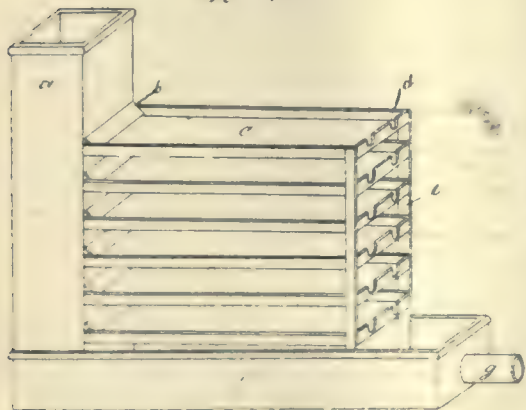
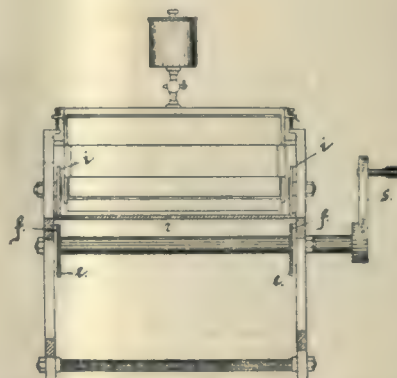


Fig 2

Fig 3



op; the holes are of the size of an ordinary pin's head, and number 25 in each of the three upper rows, 23 in the fourth, 20 in the fifth, and 17 in the sixth or lowest row.

#### THILMANY'S PAPER-COATING MACHINE.

Two endless bands, *g*, of about half an inch in width, and provided with small pins, are arranged so as to run over two pairs of pulleys, *ee* and *ff*, the latter pair being adjustable in the longitudinal direction of the table. Thus, various bands of different length may be employed,

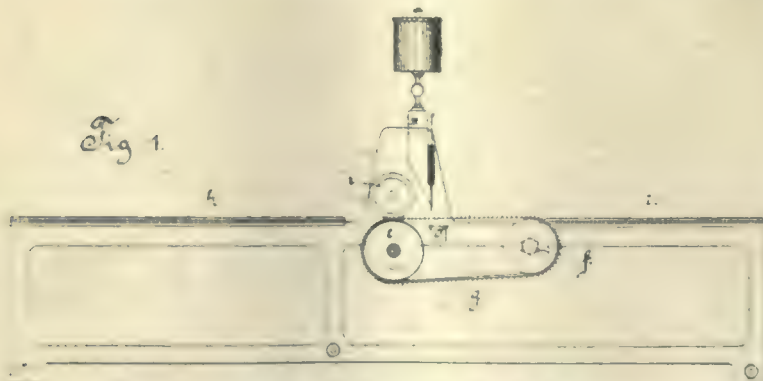
trough or duct, *o*, which extends across the whole width of the paper to be coated. Corresponding to the space required for the free motion of the bands, *g*, the plate, *h*, is provided at its sides with longitudinal grooves in which the said bands are to run over their respective pulleys.

The disadvantageous downward bending of the paper sheets is completely avoided in this improved apparatus, since the paper does not leave its support (plate, *h*), and is raised and guided by pins at the two longitudinal sides of the table when the coating substance is poured on it.

Behind the pulleys, *ff*, the paper sheet, being now coated with emulsion, is removed from the pins by a taking-off plate, *r*, and may be stored in the ordinary manner.

This apparatus is set in motion either by hand, as shown in the drawings (fig. 2), by means of a crank lever, *s*, mounted on one of the shafts of the said pulleys, or it may be actuated by mechanism and motive power.

Fig 1



running over the pulleys according to requirement, and at the same time the bands are easily kept taut.

The paper to be coated with emulsion is laid upon plate, *h*, and conveyed up to the pulley, *ee*, at the top of which corresponding rollers, *i*,

#### HONOURS FOR SIR G. G. STOKES.

SIR GEORGE GABRIEL STOKES, upon whom the University of Cambridge is bestowing many honours this week, was born in 1819 at Skeen, co. Sligo, and was educated at a Dublin school, at the Bristol College, and at Pembroke College, Cambridge. He was Senior Wrangler in 1841, when he was appointed to a fellowship, and in 1849 he was appointed to the Lucasian Professorship of Mathematics at the University. He was elected a Fellow of the Royal Society in 1852, and in the same year was awarded the Rumford medal in recognition of his discovery in the change in the refrangibility of light. From 1854 to 1860 he was lecturer at the Royal School of Mines, when he resigned, and so long ago as 1869 he was President of the British Association when it met at Exeter. For some years Sir George Stokes acted as one of the secretaries of the Royal Society, and in 1885, on Professor Huxley's retirement, he was elected President, and was succeeded by Lord Kelvin in 1890. From 1887 to 1892 he represented the University of Cambridge in Parliament, and was



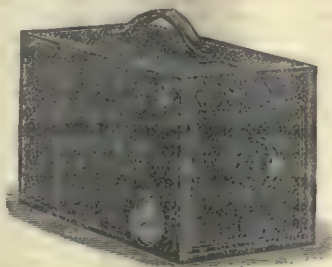
created a baronet of the United Kingdom in 1889. He is an Honorary Fellow of many of the foreign academies, and all our leading universities have conferred upon him the highest honours they can bestow in the way of honorary degrees. His contributions to the transactions of the learned societies have been many and varied, and the Burnett lectures on "Light," delivered at Aberdeen, and afterwards published, would alone have won him a wide reputation, while his discourses on "Natural Theology," delivered as Gifford Lectures at Edinburgh, bear testimony to his wide range and his high attainments in other directions than those of pure mathematics or experimental science. Sir George has been a member of the Royal Photographic Society since 1856.

## Our Editorial Table.

### THE ZENITH CAMERA.

Kodak, Limited, 43, Clerkenwell-road, S.E.

THE No. 3 and No. 4 Zeniths are constructed for use with glass plates in double plate-holders, and are also adapted for exposures on rollable daylight film in an Eastman's cartridge roll-holder, the latter being readily interchangeable with the plate-holders. In addition to a carefully graduated scale, the Zeniths are provided with ground-glass focussing screen upon which each separate exposure, whether on film or plates, may be focussed if desired. There are sockets for tripod screws, view-finders for vertical and horizontal pictures, &c.



The No. 3 Zenith, for  $4\frac{1}{2} \times 3\frac{1}{2}$  plates, measures  $4\frac{1}{2} \times 5\frac{1}{2} \times 9\frac{1}{2}$  inches. The weight is thirty ounces. The No. 4 Zenith, for  $5 \times 4$  plates, measures  $5\frac{1}{2} \times 6\frac{1}{2} \times 11$  inches, and the weight is thirty-three ounces. The Zenith cameras are fitted with lenses giving excellent definition, and have sets of three stops. The shutters are of the rotary type, and are everset. For snap-shots the exposure lever is simply pushed alternately to the left or the right, as the case may be. Time exposures are obtained by the adjustment of a simple catch, so that it engages with a projection on the shutter.

### AMERICAN PORTRAIT STUDIES.

Collected and arranged by CHARLES HETHERINGTON.

133 pages, containing 470 portrait and group studies. Price 12s. 6d.

London: The Photogram, Limited, 6, Farringdon-avenue, E.C.

WHEN drawing attention to our American contemporaries and their annuals we have often dwelt upon the characteristic excellences of Transatlantic portraiture, which perhaps, save in respect of the work of the leading British photographers, has a *vim* and style not seen in the productions of the rank and file here at home. The volume before us enables us, by the courtesy of Mr. Snowden Ward, to see at a glance reproductions of a large and representative collection of American portraiture, to which over ninety photographers make contributions. The work is also decoratively illustrated, and there are some articles on subjects of interest to professionals. The greatest praise we can bestow on the volume is this, that it is worth acquisition by British professionals in order that they may gain a direct idea of the characteristic excellences and features of posing, lighting, and treatment which American portrait and group work undoubtedly possesses. It is really a splendid object-lesson in American professional work.

*How to Make Snap-shots* (price 1d.) is the title of a little guide to photography issued by Mr. W. Tylar, 41, High-street, Aston, Birmingham. It is designed for the use of beginners, no matter what camera they may use, and the information it contains well fulfils that purpose.

### CATALOGUES RECEIVED.

MESSES. ADAMS & CO., of 26, Charing Cross-road, W.C., send us a beautifully produced pamphlet describing and illustrating the Adams De Luxe cameras, and giving many fine reproductions of negatives taken in those superb instruments. The list, which is a most artistic production, is sent to applicants on receipt of ninepence.

The Monroe Camera Company, Sutton House, 2, Old-street, E.C.

THE little forty-six page catalogue of the Monroe Camera Company is plentifully illustrated. It gives prominence to the varied series of hand cameras which are the specialities of the Company, and lists general photographic apparatus and sundries. Those photographers who appreciate hand cameras, on what may be termed the American model, should send for a copy of this catalogue.

The London Stereoscopic and Photographic Company, 54, Cheapside, E.C.

THE new "City" catalogue of the London Stereoscopic Company is filled with particulars of a large assortment of apparatus suitable for amateur photographers and others. The "City" new roller blind shutter, time and instantaneous, with speed indicator, is one of the specialities of the Company, who are putting a new brand of plates on the market also termed the "City." At the Company's handsome premises in Cheapside one is always assured of obtaining the very latest introductions to the photographic market, indeed, the apparatus department in the experienced hands of Mr. E. Miles, is one of the most stylish and skilfully conducted that we know of.

W. F. Slater, 5, First Parade, High-road, Lee, S.E.

In this net wholesale list of frames and mounts, Mr. Slater gives prices of "club" frames; solid oak with gilt or gold slips; carved solid oak; exhibition frames (the "Royal" and the "Salon"); cut out mounts; plush mounts; sundries, &c. It is a list which photographers should always have at hand for reference, for Mr. Slater's work is uniformly good and tasteful and his prices are low.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, June 7. "The Joly Process," by Mr. J. W. Mason.

ON Wednesday, May 31, Mr. H. Snowden Ward lectured at the London Chamber of Commerce on "The Philadelphia Commercial Museum."

ARRANGEMENTS are in progress by the British Astronomical Association for the organization of two expeditions to observe the total solar eclipse of May 28, 1900—the one to Portugal, Spain, and Algiers; the other to the United States.

BANK-NOTE FORGERIES IN HUNGARY.—A lithographer named Hochrein and a mechanic named Goepl have been arrested at Fünfkirchen, Hungary, for forging ten-gulden notes. The notes were produced by a photographic process, and large numbers of them were put into circulation.

IN the possession of the Hon. Treasurer of the Birmingham Liberal Club (Mr. J. Rowlands) is a curious photograph of special interest. The photographer took a "snap-shot" of Tenby Church and steeple, and on developing the negative was surprised to find the picture disfigured at the top by the reversed figure of a vessel dressed with bunting. The key to the puzzle was discovered the next morning in the report of the launching of a vessel in Pembroke Dock, seven miles away. The plate "caught" a mirage of the launch.

A PARTIAL eclipse of the sun, which will be visible at Greenwich and throughout Northern Europe and Northern Asia, takes place on June 7. At places where the greatest eclipses will be visible somewhat more than half the sun's diameter will be obscured, although in our own country only about one-fourth or one-fifth of the diameter will be obscured. At Greenwich (and approximately throughout the British Isles) the first contact is  $42^\circ$  from N. towards W., and last contact  $29^\circ$  from N. towards E. At Greenwich the eclipse will last an hour and ten minutes, the maximum being reached at 17 h. 17 m. Greenwich mean time.

A DEMONSTRATION of various processes with tabloid chemicals was given at the Polytechnic Society's meeting on May 24 by F. Wilson. These very convenient, portable, and reliable photographic chemicals were specially recommended by the lecturer for travellers, beginners, occasional workers, and any one to whom the compounding of formulas or multiplicity of bottles and solutions is objectionable. The simplicity of the operations of developing plates with pyro and accelerator, reducing with ammonium persulphate, developing bromide paper with metol, &c., and toning P.O.P. with gold and sodium formate were successfully demonstrated, as in each case the tabloids acted perfectly in every respect.

TELEGRAPHING pictures seems to have become a common practice with some of the American papers. Recently five of the chief newspapers in the New World, in different States, were placed on the same circuit, and, at a given signal, certain pictures were sent. These have been published, and are fairly clear and graphic representations. The machine was invented by Mr. E. A. Hummel, and provides for the making of a drawing on a sheet of tinfoil wrapped round a cylinder somewhat similar to the wax cylinder of a phonograph. When the current is turned on, the cylinder revolves and a needle pricks the foil and touches the outlines of the picture. At the other end of the wire is a similar machine working in harmony, only instead of a sheet of tinfoil a piece of carbon copying paper is placed between two sheets of paper. Every movement of the point in New York is reproduced, causing a corresponding movement at the other end, and giving a faithful copy of the picture. It is claimed that the picture of an event taking place in Chicago at ten o'clock could be absolutely reproduced in New York by eleven.



**THE LATE MR. JOSHUA BILLCLIFF.**—The death, at the age of seventy-eight, of Mr. Joshua Billcliff occurred on May 5 in Coupland-street, Chorlton-upon-Medlock. He was in many respects a notable man, and was best known as a maker of cameras. He was a pioneer in the work, having established the business thirty-nine years ago. According to the *Manchester Evening News*, he was the original maker of the widely known Thornton-Pickard camera and M'Kellen's double-pinpoint camera—which in 1884 gained the only medal until then awarded by the Photographic Society of Great Britain—was turned out from Mr. Billcliff's works in Richmond-street, Chorlton-upon-Medlock. Born near Penistone, and by trade a joiner, he settled in Manchester in 1854, selecting Stretford-road, Hulme, for the scene of his labours, carrying on a shopkeeping business in the front, and utilising the yard for his trade. Photography was making great strides at the time, and, possessing strong mechanical tastes, he drifted into the line in which he was destined to become prominent. Almost the very first hand camera made, and which was patented by Mr. Warwick Brookes, was made in Richmond-street, as well as several of the immense cameras used in the photography of the moon.

## Patent News.

THE following applications for Patents were made between May 15 and May 20, 1899:—

**SHUTTERS.**—No. 10,636. "Improvements in Photographic Roller-blind Shutters." J. E. THORNTON.

**BACKING APPARATUS.**—No. 10,564. "An Improvement in an Apparatus for Backing Plates, Films, or other Tissue, for Photographic Purposes." J. SKILBECK and W. J. WARREN.

**STANDS.**—No. 10,698. "An Improved Support for Photographic Cameras or other Instruments requiring a Level Base or Stand." H. P. HANSEN.

**CAMERAS.**—No. 10,318. "Improvements in or connected with Photographic Cameras." A. J. B. LÉGE and W. H. ENGLAND.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
5	South London	<i>Developers and their Modification</i> H. W. Bennett, F.R.P.S.
6	Ashton-under-Lyne	Demonstration on Developing.—Plates Exposed on Mr. Brown's Bangle will be Developed.
6	Gospel Oak	<i>Intensification and Reduction.</i> J. E. Ravner
6	Hackney	Royal Photographic Society's Loan Pictures.
6	Leeds Photo. Society	Conversational Meeting, and Discussion of Arrangements for Summer Excursions.
7	Photographic Club	<i>The Jolly Process.</i> J. W. Mason.
8	Hackney	Excursion: St. Bartholomew's Church. Leader, W. Rawlings.
8	London and Provincial	Modern Developers.
10	Kingston-on-Thames	Excursion: Zoological Gardens. Leader, J. F. East.
10	Liverpool Amateur	Excursion: Loggerheads. Leader, R. F. Soper.
10	South London	Excursion: Richmond. Leader, Mr. Jarvis.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 25.—Mr. A. L. Henderson in the chair.

Mr. HERBERT S. STARNES read a paper on

IMPORTANT PHOTOGRAPHIC PROBLEMS THAT REQUIRE INVESTIGATION.  
[See p. 342.]

Mr. R. BECKETT, in the discussion which followed, said that the paper furnished an explanation of a fact that many had noticed, viz., that the developed image was more permanent than the printed-out image, owing to the developed image containing more silver than the printed out, in which latter the author had shown how little silver was finally left. He was inclined to ask "What is art?" when the question arose as to whether a photograph could or could not be art. He thought that the prevailing loudness of tone and lack of brilliancy was altogether contrary to nature, and to be discouraged.

Mr. BARKER was of opinion that the sub-bromide theory of the formation of the latent image was a possible one, because he did not see how it could explain reversal. As regards silver prints and toning, he had always held that a silver print severely left alone was more permanent than if it had been toned with gold, and this he could support with proofs. He had silver prints, made by Warwick Brookes probably twenty years ago, in the form of negatives. They were printed to a red colour, not toned, were on albumen paper, and some were waxed, but all were still as perfect as ever they were. He wished to know why photographers should imitate artists; rather let artists imitate photography. In history artists filled a big place, but photography had gone one better. It was a later advancement, immensely superior, and for that reason let artists, he said, imitate photography, a thing they cannot do.

Mr. A. MACKIE remarked that Mr. John Spiller had that day shown him a number of interesting photographs. Amongst others hanging upon the walls were pictures medalled in 1869 and 1870, and measuring about 30×22, in which there was absolutely no change to the eye; they were beautiful in colour and admirable specimens of photography. There were also some portraits, taken at Woolwich Arsenal, of Garibaldi and others, but no change was apparent, and all were albumen prints.

The CHAIRMAN, in speaking of the sensitising of albumen paper, referred to the formation of what was called albuminate of silver, suggesting that a similar combination took place in the case of gelatine emulsions. He was in agreement with the opinion that prints not toned with gold were more permanent. It might perhaps be explained in this way: the untuned print was of a soxy colour, and, if this colour was altered in the toning bath, it was improbable that all the silver of the image was covered with gold. The result was that the print was composed of two substances, of which one might alter in colour in the course of time, and make it appear that the print was lacking in permanence. On the other hand, if the print were not toned, any change would be a general one and less noticeable. For this reason an untuned print was less liable to change in colour, and this led him to say that, however much the colour of the print may change, the silver, which was not volatile, was still there. He asked if any one could account for a change of colour in some gold-toned prints, which in 1864, when made, were of a fine purple colour, but now, by simple exposure to air and moderate light, had become as if not toned at all. He was of opinion that the substance of the paper used for sensitising was largely responsible for the permanence of print, and that the paper of the present time was not so good as that of older times. The paper itself seemed to change colour.

Mr. MACKIE did not think that the manufacture of such paper as Rives could have altered. Alluding again to the colour of prints, he related that he had a number of matt gelatino-chloride paper prints, made some years ago and toned with platinum. Originally nearly red in tone, they had become almost black. They were toned before fixing, and it was curious to note how the red pigment used for spotting now stood out from the rest of the print.

Mr. PHILIP EVERITT said that, as regards the question of the latent image, the experiments of Kogelmann had an important bearing. He took a number of plates and gave them varying exposures, increasing from a minimum to a maximum, and then right away through to reversal. Some of the plates were then fixed carefully and thoroughly washed. He then developed them with a physical developer and obtained images. Without suggesting the nature of the substance forming the latent image, it did seem curious that the plates should, after fixing, be amenable to development, and he thought it was a great difficulty in the way of the sub-bromide theory. Kogelmann's idea was that the latent image, if not silver, was some form of silver very nearly akin to metallic silver. Looking a little further, the theory of reversal seemed not very difficult of explanation. In the ordinary or normal exposure the mere skin of the particle of bromide was exposed, the inner portions of what may be termed a cube being unaffected, some time being required to penetrate to its full extent. Such an exposed film, fixed, would be deprived of the inner mass of bromide, leaving an outer shell of altered bromide. In this way one would have a plate in the gelatine of which would be a series of cavities, which, by physical development, are afterwards filled up or have silver deposited upon them. Increase the exposure to the point of reversal. The whole of the silver bromide is affected in such a manner that it becomes no longer amenable to development. Does not this point to the fact that, in order to develop an image on a bromide plate, one must have the exposed bromide, plus unaltered bromide, the developer being the connecting link? In reversal we should have no unchanged bromide, which the theory requires for the development of an image, hence no development would take place. Kogelmann used pure bromide plates for the experiments.

Mr. J. E. HODD asked, however, whether it was not a fact that, with two plates to which an exposure had been given which by ordinary development was found to have produced reversal, by altering the mode of development for the second plate the reversal effects could be counteracted?

The CHAIRMAN said he had done so by using a proportionately large quantity of developer—eight to ten ounces for a quarter-plate—and continually changing the same, flooding the plate, pouring off, and applying fresh. He ascribed it to the enormous amount of bromine liberated from the over exposed part that made it appear reversed, the bromine acting as a strong restrainer. The continual change of solution he resorted to carried off this bromine, and enabled him to secure a normal effect in a plate which would otherwise have appeared reversed.

The discussion was long and went much into detail.

Mr. STARNES replied in due course, and emphasised his views, and was accorded a hearty vote of thanks.

### PHOTOGRAPHIC CLUB.

MAY 24.—Mr. J. R. Gotz in the chair.

Mr. HENRY TROTH, of the United States, was introduced to the members, and passed round some photographs of flowers—a branch of photography in which he has achieved considerable success and notoriety in America and here in England. Mr. Troth explained that his photographs were mostly taken for their botanical value, with as much artistic quality as could be included while preserving the original purpose. For yellows he employed as a rule a fast isochromatic plate, and for the blues a slow isochromatic plate without a colour screen. He preferred to adopt this latter course, as there was more light available for focussing if the colour screen were dispensed with. When a yellow screen was employed, Mr. Troth used Bausch & Lomb's ray filter or bichromate cell. The examples were, with few exceptions, taken with a vertical camera. In some cases the flowers were simply placed upon black velvet, in others upon glass supported above the ground, with a suitable background underneath. Daylight was employed throughout, and cold-bath platinum was the printing process selected.



Mr. J. NESBIT showed a photograph of his friend the late Alfred Bryan, artist to *Moonshine*, *Entr'acte*, and other papers, and pointed out that copies were being retailed by a certain photographer of Holborn, although he (Mr. Nesbit) claimed the authorship of the photograph.

## Correspondence.

\*.\* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\*.\* We do not undertake responsibility for the opinions expressed by our correspondents.

### COLOUR FACTS AND FALLACIES.

To the EDITORS.

GENTLEMEN,—In consequence of your persistent and determined attempts to misrepresent everything connected with myself and my work, I wish to add one or two facts. It is a fact that in 1869 Du Haaron introduced a method using a lined screen. It is a fact that in 1876 Du Haaron introduced the three-colour method, with colour glasses and an arrangement for viewing the results. It is a fact that you have not described either Mr. Ives's or Dr. Joly's processes as having been tried and abandoned as useless thirty years ago, although they were introduced at that time. It is a fact that you have constantly ignored my statement, made in 1895, that I could obtain photographs in colour by three different methods, and, still ignoring that fact and statement, you endeavour to represent me as a liar, and have associated my name with whatever you can that is degrading. It is a fact that your hostility to me dates from your receipt of a letter from my solicitor.—I am, yours, &c.,

JOHN WALLACE BENNETTO.

The Studio, Newquay, Cornwall, May 30, 1899.

[And, above all, it is a fact that Mr. Bennetto has not yet solved the problem of photography in natural colours without the use of "dyes, stains, or pigments," as he claimed to have done in 1896.—EDS.]

### Re SPOTS ON PRINTS.

To the EDITORS.

GENTLEMEN,—The correspondence on the above subject reminds me of an incident which occurred in my practice which indelibly fixed one cause of minute black spots on prints in my memory.

I was called away one morning last fall from printing to photograph a machine in a neighbouring foundry and machine shops. When I had taken the negative I resumed printing P.O.P. When I came to tone in the evening I found all my prints literally ruined with minute spots.

I attributed it to the minute specks of iron dust that had attached themselves to my clothes while in the foundry, and subsequently transferred themselves to the surface of the prints while examining them in printing.

I now, however, use a preliminary bath of salt water when immersing dry prints, and find spots conspicuous for their absence.

I may say I consulted the Britannia Company on this point, and they assure me it will not harm the prints, and it certainly prevents iron spots.—I am, yours, &c.,

OTHELLO.

To the EDITORS.

GENTLEMEN,—In your last issue Mr. W. Palmer refers to above as being caused by the iron bearings of his roller squeegee, and I think he is wise in discarding these abominations. For many years I have used a round piece of box wood, 6×1½ inches—like a small rolling-pin—for rubbing down with. It can be held firmly in the hand, and much or little pressure easily brought to bear on the print. I found above in use in the establishment of the late Vernon Heath, and a very useful tool it has always proved to me.—I am, yours, &c.,

HERBERT W. BIBBS.

68, Princes-street, Edinburgh.

### AN ALLEGED PIRACY.

To the EDITORS.

GENTLEMEN,—I would like to draw your attention to a glaring piece of piracy on the part of a fellow photographer. I think it puts the cheek of the free-portrait and colour photography cranks to shame. What I refer to is a photograph of Colonel McDonald, the Sudan hero, which appeared in a number of magazines and newspapers, and bears the name of a

photographer who did not take the original picture, but merely copied it. This would be all right had the said individual permission from the original photographer to do so, but he had not. I think a case of this sort deserves showing up. What do you say, Mr. Editor?—I am, yours, &c.,

"DINGWALL."

P.S.—The free-portrait swindle penetrated this far, and a number of people indulged, and are now sadder and wiser. I prevented a few from being "done," and secured their orders.

[If the photograph referred to is copyright, the copier can be proceeded against for infringement. So much for the legal aspect of the case; the morality is obvious.—Ed.]

### A SOCIETY FOR PHOTOGRAPHIC PRINTERS.

To the EDITORS.

GENTLEMEN,—Mr. Randall says, "Mr. Willatt is mistaken in supposing that I view the question of trade unionism for photographic assistants through organizations already formed." Now, sirs, I leave the question entirely in the hands of readers of this JOURNAL to decide. All I can say is that, so far as this present correspondence has gone, this is exactly what he has done. Mr. Randall gives references to this JOURNAL for 1897, 1896, and even 1895, to try and show my statement to be incorrect. With these references I am not in the least concerned; I am only concerned with Mr. Randall's remarks in the present correspondence. What he has said in 1895 I am not going to discuss; I know what he has said in 1899.

Again: photographic assistants do not seem at all inclined to join the Shop Assistants' National Union; but, if Mr. Randall chooses to fully explain the working details of the same, and what amount of restriction would be put upon photographic assistants, I think he might induce some to join it, provided its present aspect were not too restrictive. I do not say he (Mr. Randall) has not explained it in past years, but what would be necessary would be a constant reiteration of the policy and advantages of such a union. In the mean time, my idea is to start something to improve and assist the photographic printers, not to place them "right off the reel," as Mr. Randall says, on a par with engineers or compositors.

I have tried to be plain and precise; I have never once hinted at a full-blown union on a level with engineers, compositors, plumbers, joiners, bricklayers, &c. It is rather Mr. Randall who has put the question in that light by asserting that, unless photographic assistants joined a union (one already in existence, of course), they could reap no advantages. Let any of your readers peruse his replies, and judge. In conclusion, if photographic assistants (printers or otherwise) do not see any necessity for such improvement, neither Mr. Randall nor any one else can help in any way.—I am, yours, &c.,

F. G. WILLATT.

101A, Fulham Palace-road, Hammersmith, London, W.,

May 25, 1899.

## Answers to Correspondents.

\*.\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\*.\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\*.\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS AND PAINTING REGISTERED:—

W. Blake, 38 and 40, High-street, Bedford.—Photograph of the late Robert Barry Stafford, Esq., J.P.

A. England, Triangle Studio, New Barnet.—Photograph of dog with kitten and parrot on its back. Photograph of cat and parrot.

J. A. Martin, Adelaide-street, Fleetwood.—Painting of Fleetwood lifeboat to the rescue.

GLOSS.—Sorry to say we can give you no more information than that contained in the advertisement.

T. A. G. WEST.—We do not think you have a legal remedy. The word "permanency" is vague and indefinite, and does not convey that you were engaged for a fixed period.

VARNISH.—S. BARKER. The sample sent is not mastic at all, but is dammar. This resin is much cheaper than mastic, and, if you were supplied with it at the price of the latter, you have been defrauded or a mistake has been made.



**JAMES HENDERSON.**—We know of no such book; but Gauthier-Villars, 55, Quai des Grands Augustins, Paris, publish several French books on photography which might give you the desired information. Write them for a list.

**BLACKENING STOPS OF LENSES.**—A. G. says: "The stops of my lenses, through so much use, are bright. Could you kindly inform me how I may make them a dull black?"—See answer to W. C. Johns, and refer to page 972 of the ALMANAC.

**NORTH LIGHT.**—UNCERTAIN says: "Given a wall running due east and west, on which side is the so-called 'north light' supposed to fall, that facing north or that facing south?"—That facing the north, of course; the other would be the south light.

**A. F. F.**—1. The aperture need not be absolutely circular, but the nearer it approaches to it the better. 2. The scratches will not prove a drawback in practice, but they should not be there. 3. Both are excellent for the purpose; we do not make distinctions or recommendations.

**WATER SUPPLY.**—S. AND C. If the Water Company will not supply water to the private house you have taken to do your printing at, except by meter, you will have to take it on those terms. The Company are quite within their rights, as you require the water for trade purposes.

**AMYL-ACETATE.**—CELLULOID writes: "Can you please tell me where I can get some amyl-acetate? I have tried all the chemists' shops here, and none of them keep it. They seem to know nothing of the stuff. One said there was no such thing."—Amyl-acetate is rarely kept by ordinary druggists. You will be able to get it from houses such as Hopkins & Williams, Cross-street, Hatton Garden.

**INDIARUBBER SOLUTION.**—B. L. E. says: "Please tell me how to make a clear solution of indiarubber for pouring on plates," &c.—Simply dissolve pure indiarubber in benzole. The best kinds to use are masticated rubber or Para-washed sheet. You will find it more convenient to purchase the solution as sold at the indiarubber warehouses, and thin that to the consistency desired with benzole.

**CHANGING ARRANGEMENT.**—G. F. T. says: "I am wishing to fit a changing arrangement in a camera I am making. I want it to hold twelve or more plates. Can you give me instructions to make this?"—Several very convenient arrangements are now in the market; better see some of these. Many forms will be found described in the back volumes of the JOURNAL, but space is too limited in this column to repeat them.

**ACETYLENE.**—ACETYLENE "would like to know if a studio fitted with acetylene gas would do as good as daylight? Would I be able to obtain variety and softness in lighting? Is a book published on the subject?"—No book is published on the subject. Good portraits can be taken, with skill, by the acetylene light, and with a great variety in effects; but to say that a studio lighted by acetylene is as good as a daylight studio would be saying a great deal too much.

**BLACKENING BRASSWORK.**—W. C. JOHNS says: "1. I want to blacken some exterior brasswork of a hand camera, and in this year's ALMANAC, p. 972, a chemical stain is given. Will you kindly inform me if this is a suitable medium; also what proportions should I use? 2. Would black lead be necessary to finish the parts after staining? If so, how should this be done?"—Yes. About a hundred grains of each salt in two separate ounces of water, then mix the two solutions together. 2. Not necessary.

**COLLOTYPE.**—OTHELLO says: "Will you tell me: 1. What is the proportion of treacle and glue in making rollers for colotype? 2. What is the varnish for thinning colotype inks composed of?"—1. No very definite proportions can be given, as something depends upon the character of the glue used. There is glue and glue. In practice you will find it better to purchase the composition as made specially for colotype rollers. It may be had from such houses as Penrose's or Winston's. You will then ensure having the right thing. 2. Middle or thin litho varnish.

**USING PORTRAIT LENS FOR LANDSCAPES.**—S. CLARK says: "I have often used the back lens of my rapid rectilinear (with the front one removed) for landscapes, and have got good results. I have recently bought a portrait lens, and, on trying the back lens in the same way, I cannot get a sharp picture, even with a small stop. Cannot the lenses of a portrait combination be used as single lenses, as with the rapid rectilinear? I am told they can be."—It is the front lens only that can be used as a single lens. It should be screwed into the place of the back combination, with its convex side towards the focussing screen.

**CHICAGO.**—It amounts to this: One half of the stereoscopic picture is printed in red, the other in blue. Obviously, being dissimilar photographs, they cannot superimpose exactly; hence the lack of registration. The object of the coloured spectacles is to enable each eye to see only one of the two pictures, thus fulfilling stereoscopic requirements—the red cut out the blue and the blue the red—and so the dissimilar views are presented to the retina. The colours are very probably chosen much at hap-hazard; hence the colour of the stereo image. The extreme relief is probably due to the great distance of separation between the taking lenses.

**BICHLORIDE OF PLATINUM.**—PLATINUM says: "Amongst some job lots I recently bought, I find four fifteen-grain tubes of bichloride of platinum, and about half an ounce of platinum salts sent out by the Platinotype Company for their cold-bath paper some years ago. Can you inform me whether I can make use of above for the platinum-toning bath for C.C. paper in its present state; if not, for what purpose it is useful for and probable value of same?"—We should advise you to try the experiment, although we doubt if it will answer. The price quoted, retail, for fifteen-grain tubes of bichloride of platinum is about one-and-sixpence or one-and-ninepence a tube.

**COPYRIGHT.**—B. E. E. If you were paid for taking the portrait, you have no copyright in it. The fact that the sitter has since died does not entitle you to any copyright in the portrait. The family are quite right in defying you and your threatened proceedings, although you have registered the copyright. It was not yours to register.

**URANIUM INTENSIFICATION.**—COLONEL GUBBINS says: "Some time ago I bought a bottle of the Cresco-Filma Company's uranium intensifier, and used it. The result was, negatives spoiled by a multitude of spots (I enclose a print from one). I was told that I had not soaked the negative long enough, so I tried soaking for twenty-four hours, and enclose the negative, which I don't want returned. Although the negatives were not very old, I tried a bath of dilute citric acid (lime juice) with similar results. Is the fault with me or the intensifier? If the former, where is my mistake?"—As we do not know the precise composition of the intensifier, we cannot say. We should advise you to send an example to the makers, who will, doubtless, tell you where the fault lays.

**COPYRIGHT.**—COPYRIGHT says: "1. Will you kindly inform me how to act in this case? Two years ago I asked a certain friend to give me a sitting, as he was going abroad. He did so, and I presented him with two prints, and then he wished me to give him the negatives as well. Of course I refused, and now I find his friends have had the prints copied by some one else, and have enlargements as well as prints the same size. If I copyright the negatives now, could I compel them to give up these various prints, or could I claim compensation? 1. Is it 1s. 6d. and three prints of each that one must send to you for registration or more?"—In reply: 1. By registering the photographs you could proceed, but we much doubt if you could recover penalties. Certainly you could not compel the return of the prints in question. 2. One-and-seventeen and three prints.

**FORMATE TONING.**—H. C. says: "I have been trying formate of soda for toning, and find that merely substituting formate for sulphocyanide ammonium causes the toning to be utterly beyond control, both for P.O.P. and collodio-chloride, but especially the latter. Can you, through your Correspondence column, give me a formula, or at least tell me by what means the bath can be brought under control? When I say substituting formate for sulphocyanide, I mean, of course, using the same proportion—80 grammes to 2 grammes of chloride of gold. The prints are terribly washed out in appearance when finished."—Here is Mr. Henderson's formula for the formate of soda toning bath: 20 grains of the formate to from 1 to 2 grains of gold in 10 ounces of water. The solution should be made slightly alkaline with carbonate of soda. Probably the bath was used too strong.

**SODA DEVELOPMENT, &c.**—ABBEY says: "If, instead of making up my developing solutions, I keep my pyro soda dry, (1) is it necessary that I use bromide of potassium and metabisulphite of potash along with my pyro? 2. In the soda ought I to use equal quantities of soda sulphite and soda carbonate, or soda carbonate alone? 3. What weight of pyro ought I to add to one and a half ounces of water previous to mixing it with one and a half ounces of soda for normal exposure? 4. I suppose it is better to have soda made up in solution rather than weigh it out when required for development? 5. What style, or styles, is best for retouching or modelling the face in a portrait negative?"—In reply to 1, 2, and 3: Our correspondent does not state the strength of the soda solutions he uses. Several pyro-soda formulae are given in the ALMANAC. From any of these he will be able to calculate the proportion of dry pyro to use for whatever strength of soda solution he employs. Dry pyro is not often used with soda. 4. Yes. 5. Hard-muth's leads. Nos. 3 and 4 grades are what is very generally used.

**TRANSFERRED FILMS.**—FILMS says: "I am obliged for your kind reply to my query of last week re combination printing. The bath recommended in the article named answers perfectly, the film peeling off the plate without any trouble after only a few minutes' immersion. I have been experimenting with a few paper negatives, but find that, although there is no difficulty in stripping the film, small pieces of the paper support adhere to it, making it useless. I have been using the paper rolls for stereoscopic negatives, but find the grain rather pronounced for this class of work. If the films could be transferred satisfactorily to glass, they would be perfect, the price being so low and their bulk and weight so small. Can you suggest any means of doing so? Is there any way of dissolving the paper without affecting the film, or of clearing the adhering paper from the back before transferring to the glass?"—We know of no way of successfully stripping the film from ordinary paper, but we believe a special stripping film will shortly be on the market. The Novitas paper, however, might answer our correspondent's purpose.

**PLATINUM TONING.**—F. LEMMON says: "I enclose you a rough copy of a matt collodion toned with platinum, and should esteem it a great favour if you would tell me the cause of its being yellow in the half-tone and the remedy for this. I may say I am generally toning a lot of these every week, and most of them turn out as if over-toned, viz., yellowish round the vignetting. I wash the prints first in several changes of water, and then tone in the following bath, slightly warm: 1 teaspoonful of powdered borax, 20 ounces of water, and 2 grains of gold to every forty cabinets. I then wash again, not so much as first time, and tone in the following: 8 drachms of phosphoric acid in 20 ounces of water; of this I take 3 ounces and add 1 drachm of solution of chloride of platinum, made, viz., 1 tube to 2½ ounces of water and 15 drops of hydrochloric acid (this quantity tones fourteen cabinets); then wash again and fix in hypo slightly acid."—The prints appear to be somewhat over-toned and as if the washing between the operations were not so complete as they should be. Wash more completely before fixing and try the effect.



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## EX CATHEDRA.

We give elsewhere the list of gentlemen chosen by the members of the Royal Photographic Society to judge next autumn's Exhibition of the Society. It differs very little from last year's jury. In the Art Section, Mr. Leader, R.A., replaces Mr. Wellington; in the Technical Section Captain Abney will act instead of Mr. Bulbeck; otherwise the names are identical. This is another instance of the curious conservatism of the Royal Photographic Society electorate. In the Pictorial Section the successful candidates were not all at the head of the list of nominees, three of those elected receiving fewer nominations than three gentlemen who were unsuccessful on the ballot. The result by no means represents the real feeling of the Society in the matter. Since May 31, when the ballot papers were sent in, we have received several requests to know the "latest date for voting." Many members who profess to take the keenest interest in the matter have not troubled to vote. It was entirely due to our efforts that a very large nomination list was sent out this year, and we are surprised that a proportionately large and representative ballot did not result, and that so much apathy was shown in so important a matter.

THE *Handbook to the Photographic Convention of the United Kingdom*, the Gloucester meeting of which takes place in the week July 10-15 next, has just been issued. It contains an excellent and characteristic portrait of the President-elect, Mr. William Crooke, and other illustrations, full particulars of the excursions, and a large number of notes and directions for the information of members. Mr. M. H. Medland contributes some interesting historical notes on Gloucester and neighbourhood, and a map of the town is provided. Last week we gave an outline of the Convention's arrangements for the week. In again expressing a hope that a large attendance and successful meeting will result, we have now only to add that the Hon. Secretary and Secretary of the Convention is Mr. F. A. Bridge, of East Lodge, Dalston-lane, London, who will be pleased to receive applications for membership, accompanied by the subscription, the small sum of five shillings a year.

\* \* \*

IN the current number of the Camera Club's *Journal* there are a number of critical notes, alleged to proceed from a committee of critics, on the photographs that constitute the members' Exhibition, now to be seen in the Club-room. The notes are brief, but they are calculated to be helpful, in their well-balanced praise and condemnation, to the gentlemen showing the photographs which are criticised. At the end of their notes the authors append the following protest: "We think it desirable to enter a strong protest at the growing disposition of amateurs to exhibit work which is not their own. It can only be considered derogatory to seek commendation for pictures which are not the production of those whose names are attached to them, and we fail to comprehend how any one desirous of doing artistic work can conscientiously confide the printing of his negatives to the trade enlarger."

\* \* \*

WE do not know what photographs the authors of this paragraph had in mind in penning their protest, which, of course, we have no intention of discussing *per se*, inasmuch as it relates to a purely private Exhibition; but we are, nevertheless, glad to see such a strong condemnation of a practice which is becoming only too increasingly prevalent. Last autumn we heard of many complaints as to the public exhibition of photographs which, after the production of the negative, could hardly be described as the "work" of the exhibitors, the



trade printer and enlarger being responsible for the prints. The rules of most open exhibitions provide that photographs submitted for acceptance must, up to and including the production of the print, be the work of the exhibitor. It is to be hoped that, where it is discovered that such a reasonable rule is broken, the offending exhibitor may be dealt with in such a manner that the action taken will deter others from attempting the form of dishonesty known as the assumption of borrowed plumes. In the hierarchy of the arts and crafts photography may be poorly placed, but let us keep it honest.

\* \* \*

THE next general meeting of the Röntgen Society will be held at 11, Chandos-street, Cavendish-square, London, W., under the Presidency of Mr. C. W. Mansell-Moullin, F.R.C.S. On Monday, June 12, eight p.m. Portable Röntgen apparatus for field and ward work, will be demonstrated and described by Major Beevor, R.A.M.C., Mr. J. Hall Edwards, and Mr. H. W. Cox. A new stereoscope will be demonstrated for Mr. Gregory, by Mr. F. W. Watson Baker. Dr. Walsh will also show a new stereoscope.

\* \* \*

IN connexion with the centenary celebrations of the Royal Institution, which have been held this week, Mr. W. Hugh Spottiswoode has been good enough\* to send us an illustrated book descriptive of the Spottiswoode collection of physical apparatus which the first-named gentleman has presented to the Royal Institution. The first part of the book is devoted to a brief appreciative memoir [of the late William Spottiswoode, who, up to the time of his death in 1883, filled a very large part in the world of physical science. He was President of the Royal Society in 1879, and, among other important offices, at one time held the Hon. Secretaryship of the Royal Institution. The apparatus here described is among the most magnificent that could be devised for the study of physical science, and the book, as a whole, is a worthy tribute to one who gave up a very large part of an active life to an examination of the problems [of light, electricity, and many other branches of physics.

\* \* \*

ACCORDING to an Australasian exchange the professional photographers of Auckland, (New Zealand) have held a successful and representative meeting, and have resolved to form themselves into an association to encourage unity in the craft and to raise the status of the profession. We heartily wish the movement the utmost success although its objects have the drawback of vagueness.† Unity is a very fine thing in its way, but what does it mean in this particular application of the term? Again, what loftier aim could there be than that to raise the status of a profession, but how is it to be done? It is in no carping or hostile spirit that we ask these questions—the same things have been talked and written about and occasionally attempted in Great Britain, absolutely without success. English photographers appear incapable of combining and holding together for purposes of mutual help and advantage; and all the efforts that are put forth to rid them of this disability seem doomed to be fruitless. It has long since passed into proverb that the professional photographer of these islands is like the bird quoted by Lord Dundreary, he prefers to "flock all by himself." Still, we wish the Auckland photographers success in their, doubtless, well-meant efforts to

help each other; and we shall be agreeably disappointed if these efforts escape the usual fate of failure.

\* \* \*

VERY many of our professional readers knew the genial and energetic Arthur C. Baldwin, who for some years past has been the country representative of one of the most respected houses in photography—The Paget Prize Plate Company of Watford. Owing to some changes in the *personnel* of the Company's staff, Mr. Baldwin will in future represent his firm in London and the South. Mr. Baldwin is an admirable man of business, and we wish him well in his new sphere of work.

\* \* \*

MR. C. M. HEPWORTH, who has long been known as an expert in cinematography, has recently commenced business at Hurst Grove, Walton-on-Thames, under the name of Hepworth & Co., cinematographers. In the design, construction, and manipulation of cinematographic apparatus there is nothing that Mr. Hepworth does not understand. The new firm start with the aim of making animated photographs, and are thoroughly equipped for the work. We wish Messrs. Hepworth & Co. the utmost success in their undertaking.

\* \* \*

MR. ALFRED SEELEY, of 22, Haldon-road, Wandsworth, informs us that he has opened an office for a professional and business agency at Regent House, Regent-street, W., to register particulars of all professional or business vacancies or applicants for the same, and for the sale of businesses in town or country.

\* \* \*

THE *Strand Magazine* for June, which is a double number at the price of 1s., is noticeable for a chatty and informative article on the use of the Röntgen rays in warfare, which is illustrated by reproductions of many radiographs. The subject has already been authoritatively dealt with by Mayor Beevor at the Camera Club and elsewhere; but, in the article before us, it is presented in a more popular fashion. Of the monthly magazines the *Strand*, perhaps, makes the most lavish use of photography, for which it invariably has a kind word.

\* \* \*

ACCORDING to the *South African News*, the Capetown Photographic Club recently held a most successful open Exhibition. It was visited on the first day by over 1000 persons. The opening ceremony was performed by the famous artist, Lady Butler (better known by her maiden name of Elizabeth Thompson). The Exhibition was entirely free, and it appears to have been locally regarded not only as an interesting social function, but as an important contribution to the cause of photographic progress in South Africa. We congratulate the Capetown Club on their admirable efforts, and trust it will organize similar exhibitions in the future.

\* \* \*

IN another part of this week's JOURNAL we reprint, from the last number of the *Journal* of the Photographic Society of Philadelphia, the report of a discussion on Professor Wood's ingenious system of colour photography by means of diffraction gratings, in which the Professor himself, Mr. Ives, and other gentlemen took part. Many interesting points concerning the practical applications of this novel and beautiful process are referred to. In a note received from Professor Wood, he tells us that he is shortly publishing something in this country on the process, which seems to be developing in a satisfactory manner.



## DARK-ROOM ILLUMINATION.

As the photographic season may now be considered as opened out, and the ever-increasing army of amateurs setting their houses in order for a long campaign, the present is an opportune time for a few words on a very important factor in photographic operations—the dark room and its lighting. We are led to make some observations on the subject through having recently met with no inconsiderable number of cases where advice was much needed—cases where, of all others, it might have been thought, *à priori*, that the particular house was bound to be set in order, not amateurs houses, alone, singular to relate.

It goes without saying that the first requirement, as regards the illumination, is virtual safety, and, next, to have as much light as possible so long as the first requirement is satisfied. Lord Palmerston defined dirt as “matter in the wrong place.” An unsafe light may be described in similar language as light in the wrong place. The search for a safe light is a complete *ignis fatuus*, as futile as the search after perpetual motion. Ordinary dry plates are sensible to all radiations giving visible light, but, naturally, not to the same degree. Hence, when we speak of the two requirements as virtual safety with a maximum of light, it must be understood with the qualifications expressed.

But it is one thing to have light shining directly upon the plate, and another to have it lighting the dark room generally, so as to enable the operator to see with comfort what he is doing and where everything lies. This is no slight matter when there is much work to be done; many a negative is broken or scratched through working in darkness, when a sufficiency of light might be employed without danger. It follows from this that a good, fairly strong light may be used in a room, provided the handling and developing of plates is not carried on too close to it. A recollection of the well-known rule as to the intensity of light varying as the square of the distance from the source will show, for example, that, if a certain light caused fog on a plate after five minutes' exposure to it at a distance of a foot, it would need three-quarters of an hour's action to produce an equal amount of fog when no more than a yard away. We wish to make a particular qualification with regard to this rule; it is only applicable when the source of light is small, such as a gas or lamp flame, or an electric light. It is entirely inapplicable to windows of some considerable area, say, whose linear dimensions are such that a possible retiring distance is only a few times larger than the height or breadth of the window. It is important to note this, for the error both as regards dark-room windows and studio lights has been one of frequent occurrence in photographic literature.

It will naturally be a question for consideration whether the light should be an artificial one or natural daylight. The latter costs nothing; but that, indeed, is its chief advantage; for, seeing that certainty of results is nearest the greater the uniformity of working conditions, it is obvious that a source of light practically constant, such as gas or oil light, must be more uniform than the capricious light of sky or clouds, and especially is this useful in judging density. An artificial source has also the advantage of portability, the illumination can be had exactly in the direction or at the point needed. The convenience of having the light always ready, during the hours of day at any rate, will always weigh, and daylight as one source will frequently be chosen, though it may be suppl-

mented by gas or other combustion. One point, however, with regard to the use of a window bears on the question of safety, and that is its size. We remember a singular example. A well-known photographer was troubled with fog in a new dark room he had built, but could not believe its source to be the window (glazed with ruby glass), for the glass was from the identical stock from which his old dark room, in use for years, had been glazed. Yet, eventually the evil was traced to the window; the new one was many times larger than the old one, and so let in a proportionately greater quantity of light. In one case a twelve-inch pane had sufficed; in the other, a large window five feet by three was glazed, and thus let in fifteen times as much light as the former. It needs no argument to show that a light area, too feeble to fog in reasonable time when its dimensions were small, might easily do serious injury when the light upon the plate was fifteen-fold greater in quantity. It is evident that the true meaning of a safe light had not occurred to the gentleman in question.

Turning now to a consideration of the colour of the light employed, though mixtures of yellow and green are still employed by some, it is yet a fact that, owing to the exiguous character of the quick plates of modern make, the general consensus of opinion is in favour of a ruby tint. It is, however, singular that to get double-flashed ruby is most difficult—it is not often stocked even by the large houses of the trade—while to get a sample of glass flashed with ruby on one side and orange the other is almost impossible; yet, although the latter gives more light, its actinism is greatly below the double ruby. It is commonly admitted that a light-filterer of these two colours is superior to one of ruby alone.

For this reason, if a window is covered with fabric of one or other kind, it is always desirable to put a double thickness, one being of red or ruby, and the other of orange or yellow. There is a caution worth giving in regard to the addition to existing windows of coloured media. There is always danger of leaving light leakages in one place or another, and, when a window is covered with its ruby screen, enough coloured light comes through to mask any possible white light either at the window itself or in its vicinity. If, however, a large piece of brown paper, just the size of the ruby protector, be placed over the latter temporarily, the room will be plunged in temporary darkness, and the slightest trace of white light at once detected.

We have now touched upon the most important points in connexion with the subject indicated by the title of this article, and our work will not have been in vain if we have only enabled the average photographer to realise the true inwardness of the term “safe light.”

**Dark-room Windows.**—In reference to the foregoing subject and the use of daylight in dark rooms, the window is frequently covered up with one or other of the fabrics sold for the purpose, and perfectly safe most of them are when they are new, but not so after they have been exposed to the light or a long period; they change, though the change is not noticeable from the inside of the room, as the colour does not in the majority of cases bleach out, but changes to a brown. The fabric by this change loses its non-actinic character, though it does not admit any more light. Hence the change, as we have just said, passes unnoticed and unsuspected till trouble arises. We call attention to this matter because two or three instances have recently come under our notice of trouble from this source and batches of plates being condemned as being foggy. In



the cases just referred to the windows were covered up last summer or spring, and the fabrics, with two or three thicknesses of them, were perfectly safe; but the summer light had its effect, though no ill was discovered during the feeble light of the winter and early spring months. But the case was different with the brilliant light we have been having the last month or two. Then trouble from an unexpected source was experienced. Those who use daylight in their dark rooms, and employ fabrics for the window, should periodically examine them to see if they have undergone any change, whether apparent to the eye from the inside or not.

**The Chlorate of Potash Explosion.**—When noting this catastrophe three weeks back, we mentioned that the chlorate, *per se*, was not explosive, and we should await with interest the evidence given at the inquest. Last week the inquest on the remains of the five unfortunate victims was concluded, but, from the reports that have appeared in the daily press, very little actual light was thrown on the real cause of the explosion of the chlorate. The manager of the works, in his evidence, said that over 150 tons exploded, but he had, like most others, never regarded chlorate of potash as an explosive. When asked why so much of the salt was stored near the drying, milling, and cooling rooms, he said that it had hitherto been considered free from explosive effects, and that, in his opinion, the explosion was brought about by the mixture of gases caused by the fire. It will be remembered that the explosion was caused by a fire that originated in an adjoining building. This opinion was endorsed by the manager of another chemical factory. In the end the jury, after due deliberation, returned a verdict of accidental death, with a rider to the effect, amongst other things, that chlorate of potash should be stored in quantities limited by Government control.

In the days when lanternists and photographers had to make their own oxygen from the chlorate of potash, accidents sometimes happened, but they were usually attributed to carbonaceous matters in the manganese which was used with the chlorate. But there could be no such matter in the chlorate that exploded when it was made, so that they must have become introduced during the fire in some form or other—according to the opinion of the witnesses—in the gaseous form. Many will, no doubt, consider that the evidence as given at the inquest does not fully account for the explosion of the chlorate of potash, which has hitherto been considered a non-explosive, and by itself a harmless material.

**A Photographic Expedition.**—The Vienna correspondent of the *Standard* says that the Vienna Academy of Science has decided to send a party of astronomers to Delhi for the purpose of photographing Leonides. The photographs are to be taken at two different places several miles apart. The Vienna Academy is an exceedingly enterprising body, in the interests of science we would that we had several such in this country.

**Another New Element.**—It is announced that Mr. Edward Lippman, Professor of Chemistry at the Vienna University, has discovered another new element, and that he has informed the Vienna Academy of the fact. In due course, according to its customs, the details of the discovery and of the new element will be published by the Academy. The publication will be looked forward to with interest by all scientists. Years ago all the elements were thought to have been known, but with the advancement of science new ones are continually being discovered. We wonder if this latest addition will have any photographic interest?

**International Copyright.**—The official *Reichsanzeiger* has notified that Japan has joined the International Copyright Convention, concluded at Berne in 1886, as well as the Supplementary Convention of 1896. Henceforth all works of art, including photo-

graphs, copyrighted in this country will be copyright also in Japan; also, all works copyrighted in Japan will be copyright here. In this matter Japan sets an example to some other countries—America, for example, which has hitherto held aloof from the Convention. It is notorious that English and Continental works are systematically pirated as soon as they arrive in that country, so much the worse for the English and Continental publishers.

**Modern Etchings.**—Last week, at a sale of prints, one of Whistler's early etchings, *The Engraver*—a portrait of either Rioult or Carpentier—was knocked down to a New York gentleman, after a spirited competition, for the sum of 72*l*. This, we believe, is really a record price for an etching sold "under the hammer" during the lifetime of the artist who produced it. Higher prices have been realised for modern etchings, but only after the artist's death. For example, some of Merion's have been sold for over a hundred guineas each, but only after his death. It is said that for some of these Merion during his lifetime was glad to receive only a few shillings each. One wonders what the best photo-etchings will realise if brought under the hammer after their producer's death. It is a noteworthy fact that our American cousins often pay the highest prices to secure works of art by the best artists. Some of our best works have left this country for America from time to time, but always at a high price, often, it is said, far beyond their value. Old line engravings and mezzotints by the best engravers always fetch high prices, but that is partly accounted for by the fact that line and mezzotint engraving has become almost an extinct art. The old workers have died off, and there are few or no new ones to take their places. Photogravure is, no doubt, accountable for much of this, condemned as it is by artists, or, rather, art critics.

**Pigeons as Letter-carriers.**—Last week it was announced in the daily press that a carrier pigeon was found dead in a garden at Hythe. It was the bearer of some thirty messages from passengers on the liner *La Gascogne*. Some of the letters, it is said, were in English and some in French; and they were contained in a thin piece of celluloid and were reductions by photography, so that the aid of a microscope was necessary to decipher them. The liner, says the report, was fifty miles west of the Scilly Isles when the bird was dispatched. Some may probably look upon this as an entirely novel idea, whereas it is quite an old one. During the Paris siege the pigeon post was a regularly established thing—indeed, it was the only means of communication with and from the outside. Reduced copies of the messages, several on a plate, were made by the wet-collodion process, and the films were afterwards stripped off the glass. A number of these were put into a quill, which was then attached to the pigeon, and it was dispatched. On arrival the films were put into the lantern and projected on the screen, sufficiently large to be read. They were then rewritten, and sent on to those for whom they were intended. Quite a large number of these films, each containing several letters, were contained in each quill, and they only weighed a few grains, the collodion being so very light. Hence it will be seen there is no novelty in pigeons being the bearers of letters reduced by photography.

#### AMMONIUM PERSULPHATE.

As you have published in the valued columns of *THE BRITISH JOURNAL OF PHOTOGRAPHY* my article upon persulphate, likewise the correction I sent you, and the reply of Messrs. Lumière, which first appeared in the *Bulletin de la Société Française*, I trespass once more upon your kindness by asking you to publish the following:—

The remarks which I made concerning the theory propounded by Messrs. Lumière, as to the action of persulphate of ammonium, have provoked a reply, which I think fails to dispense the doubts which I raised.

I asserted most emphatically that the action of ammonium persulphate upon a solution of silver salt forms a compound by decomposition (probably a sub-sulphate of silver, but never, according to my experience, metallic silver). As I have already said, this can easily be proved, by observing that the precipitate is rapidly and completely dissolved by



hyposulphite of soda, and gives up sulphuric acid to the water. Consequently it cannot be maintained that, in addition to the solvent action of the persulphate upon the silver at the surface of the plate, there is a corresponding inverse reductive action of the persulphate upon the sulphate of silver formed, by reason of which metallic silver tends to be precipitated. Under any circumstances this precipitate could only be a sub-sulphate of silver. On the other hand, I have found that a large excess of persulphate, in presence of a very small quantity of silver salt, does not form any precipitate. I think the experiment, mentioned by the authors in their reply, does not detract from the importance of this fact, also that it lends no support to their hypothesis. It is quite true that a solution of silver sulphate, whether prepared by decomposition of persulphate in presence of a reducer, such as pyrogallol or hydroquinone, or otherwise, causes an intensification of the negative by deposition of metallic silver upon the image. This we should expect. But the reducing action of pyrogallol (or hydroquinone) cannot be compared with that of persulphate.

The former, without doubt, forms a deposit of metallic silver, but the latter, as I have proved, never forms a deposit of metallic silver, but a product of reduction (sub-sulphate). Moreover, it should be noted that pyrogallol, in presence of a soluble silver salt, acts as a reducer, independent of the proportions of the two substances, whilst persulphate does not exercise a reducing action when in very large excess. I would also draw attention to the following fact, mentioned in my first paper upon the action of persulphate. I found that not only did a neutral solution of persulphate act as a reducer, by first attacking the denser portions of the negative and afterwards the half-tones, but that the same effect was obtainable with an ammoniacal solution of persulphate, although the action was considerably slower. Now, whatever quantity of silver salt be added, an ammoniacal solution of persulphate of ammonium forms no precipitate of metallic silver or any other product of reduction.

In a paper which I read on May 18 at the Italian Photographic Congress, at Florence, I spoke at length of the use in photography of a solution of permanganate of potash and sulphuric acid, and I stated that a very dilute solution acted as reducer of the photographic image in a manner somewhat analogous to persulphate. In this case there is no ground whatever to suppose that silver is deposited upon the image.

I must therefore repeat, that, in my opinion, the true cause of the selective action of persulphate still eludes us. PROFESSOR R. NAMIAS.

#### DIFFRACTION-GRATING COLOUR PHOTOGRAPHY.

At the last meeting of the Photographic Society of Philadelphia, as reported in its *Journal*, Professor Wood said that he had some hesitation in consenting to show the very crude results obtained thus far by him in the attempt to reproduce the colours of nature by diffraction, and that, after seeing Mr. Ives's beautiful pictures, he had still more hesitation. He explained that his pictures were the result of three weeks' very hasty experimental work and were extremely crude. Whether it would be possible to make them any better, or to develop the process any farther, he did not know, but it was extremely interesting to get a picture in colour by an entirely new method. The idea occurred to him, in endeavouring to think of some way in which the surface of glass could be impressed with a structure which would send light of a certain colour to the eye, and then to impress on it another structure to send another colour to the eye without interfering with the first colour. In the three-colour process, it is impossible to use the three colours by superposition; if green and red gelatine films are superposed, black, and not yellow, is the result, because the coloured lights are not mixed. By means of a diffraction grating it is possible to produce a surface which will send two different colours to the eye at the same time.

The principle of the process is as follows: If we take a glass plate ruled with very fine equidistant lines by a dividing engine, this plate of glass has properties somewhat similar to a prism. If we place in front of a lens such a glass plate, then, instead of the lens forming simply an image of a source of light, such as a lamp, there is formed in addition to this image a series of rainbow colours on each side of it, the blue light on the end towards the centre and the red farthest away. If we perforate the screen on which the spectra are thrown, light the perforation with the blue of one of the spectra, and view the grating through the hole, it will appear blue. The same is true for the other colours, that is, the colour of the grating depends on the position of the eye. Now, the greater the number of lines in the grating, the farther the spectra are thrown from the centre, so that, by using three gratings, one over the other, one having about 2000 lines to the inch, one 2500, and one 3000 lines to the inch, the red from one grating, the green from another, and the blue from another grating can be thrown on the same spot, and the eye will see the grating illuminated by a mixture of the three, that is, by white.

Then, if we have a grating on which the ruling is not uniform—say, a band ruled with 2000 lines, another with 2500, and another band with 3000—if viewed properly, the grating will appear as three bands of red, green, and blue.

If, now, we have a plate with a design of a tulip blossom with leaves growing in a pot, and the blossom has 2000 lines to the inch photographed on it, the leaves 2500, and the pot 3000, and we view this plate as described, we shall see a red tulip with green leaves in a blue pot. Thus we see how a coloured picture can be formed of diffraction gratings.

So far, Professor Wood said, he had not attempted to produce one of these grating pictures in the camera, the three-colour records being taken separately in the usual manner, through red, green, or blue filters. From these, three ordinary lantern-slide positives were made. The positive, representing the action of the red rays, is placed over the diffraction grating rule with 2000 lines to the inch, and then there is placed under that a piece of ordinary glass flowed with a solution of gelatine and bichromate of potash. The sunlight goes right through the transparent parts of the picture, and prints on the film an image containing 2000 lines to the inch. This operation was repeated for the green and blue. The lines thus formed are quite invisible. Then we have, as a result of this triple printing, a transparent picture with very fine lines distributed according to the colours of the original.

If the plate is then placed in front of a lens, we will get red from the coarse grating, green from the intermediate one, and blue from the fine one.

Now, if we take another plate of glass and flow it with bichromated gelatine and place it in contact with this and hold it in sunlight, at a single printing process we shall have produced on that plate, in just the right places, exactly the same arrangement, and we can print another one from that. The copies will be positive, and cannot be distinguished from each other.

Professor Wood went on to say it had occurred to him that, if a suitable photographic plate could be found, it would be possible to produce in the camera, on one plate, a finished photograph of this kind, which should be seen as a positive. That might be accomplished in this way: if a photographic plate is exposed in a camera in succession, through red, green, and blue screens, or ray filters, on the surfaces of which diffraction gratings of 2000, 2500, and 3000 lines to the inch are ruled or photographed, then the parts of the picture which are red would be impressed with 2000 lines to the inch, the green with 2500 lines, and the blue with 3000. This would require a photographic plate of very fine grain, which would be at the same time sensitive to red light. It remains to be seen whether this can be done. At present the colours obtained are too brilliant. The development of the process is simply a question of surmounting the mechanical difficulties in photographing the gratings.

Mr. Redfield remarked that he was sure that every one had been delighted with Professor Wood's lucid explanations, and asked if any one had any questions to ask.

Mr. Carbutt asked Professor Wood whether it had occurred to him to use a rotating plate or a moving sensitive film in taking the pictures of the sound waves.

Professor Wood replied that he thought nothing would be gained by that, as there was no great necessity for uniformity of motion, it only being necessary to move the plates enough to get the images separated, which could be done just as well in the simpler way.

Mr. Frederic E. Ives said: Professor Wood's method of colour photography is not an easy one to explain so that everybody will readily understand it, but his explanation of it has been remarkably good and clear, and the originality and theoretical soundness of the procedure must be evident to everybody who is familiar with the subject. It is, of course, another variation of the trichromatic process of colour photography, already well developed along other lines; but it is the most striking and original method of carrying out the principle that has been suggested in a long time.

The idea of producing a colour record in three photographic images is now about thirty-seven years old, and it is more than ten years since I first reduced it to really successful practice by working to the Maxwell colour curves; but there remained the problem of means of synthesis calculated to meet all the requirements and wishes of the public. In the Kromskop and triple-lantern projection we have optical synthesis with three uncoloured photographs and three colour screens; in the so-called Joly or MacDonough process we have optical synthesis with a single image and a single screen, which may be described as linear mosaics of the three photographs and three-colour screens of the other methods; in typographic and gelatine "three-colour printing" we have synthesis by superposed transparent colour prints; and now Professor Wood gives us optical synthesis with a single print, without colour or colour screens, but requiring a special viewing device—distinctly a new departure.

There are evidently some technical difficulties to be surmounted, and only by actual experiment can the practical importance of these difficulties be determined. One difficulty which occurred to me was that of securing variation of intensity of colour proportionate to the depth of printing of the diffraction lines in the gelatine or albumen film; after printing to a certain depth, longer printing does not increase the brilliancy of the diffraction spectrum obtained, and it is a question



whether the full scale of gradation of the photograph can be reproduced by means of a print made in diffraction lines. This question has an important bearing upon the reproduction of the ordinary compound colours of nature. Professor Wood has told me that he recognised this difficulty, and that within certain limits of exposure he had been able to obtain gradation in the image corresponding to variations in the density of the photographic positive from which he made the diffraction line prints.

Professor Wood now makes his original colour record as the Kromskop colour record is made, but makes the very interesting suggestion that the diffraction lines might be impressed upon the plate by the initial exposure in the camera, in which case a single picture would be produced which would be ready to show the colours as soon as developed and fixed. Assuming the possibility of securing satisfactory gradation of light and shade with a diffraction line print, this idea is perfectly feasible from a theoretical point of view; but it cannot be accomplished with ordinary photographic sensitive plates.

Colour photography has been very much in the air during the past ten years, announcements of alleged new processes appearing every few months, followed by glowing newspaper accounts. In most cases there has been a great air of mystery about these alleged discoveries, and we have waited for months, in some cases years, before finding out that these methods were either fraudulent or not really new, but applications of the trichromatic theory with unessential modifications, which, as a rule, are not even improvements upon published methods. It is, therefore, very refreshing to have somebody bring forward a really new and original idea, and Professor Wood is to be congratulated upon having made the most original suggestion that has been made for a long time.

Professor Wood: In regard to the possibility of getting the pictures with one exposure in the camera, I find that I can get a record of a single set of lines by exposing a plate under the coarsest grating and developing it; viewed in the viewing apparatus, it showed as a positive, although the brilliancy could not be compared with the original. I do not think, however, it would be possible to secure, on an ordinary plate, three different sets of lines superimposed, the grain is so coarse that it could not take much more than a single set of 2000 to the inch. I believe, however, that possibly with a plate somewhat similar to the Lippmann plate—or something between a Lippmann plate and an ordinary dry plate—something might be done. I do not know whether plates of that kind can be made sensitive to red. Mr. Ives can tell us.

Mr. Ives: The Lippmann plates are made sensitive to red.

Professor Zeokwer: I should like to ask Professor Wood whether he has succeeded in photographing a musical sound?

Professor Wood: No, that has not been tried. The trouble is, that the condensation is not sudden enough. It might possibly be done close to a vibrating string, but my impression is that the condensation would not be sudden enough. The crack of the spark gives a very sudden blow to the air and a very sudden condensation. I doubt if the condensation in an ordinary musical note would be sufficient. Of course, the waves of musical notes can best be photographed by photographing flames thrown into motion by them, which only show, however, the changes of the flame, owing to the sound, and not the waves themselves.

George Vaux, junr., said it seemed to him that what Professor Wood had said and done was really epoch-making, and the Society was to be congratulated upon having had the opportunity to hear Professor Wood and see the results of his brilliant work. He therefore moved that the Society tender to Professor Wood a hearty vote of thanks. It was unanimously agreed to, and the Society then adjourned in order that the members and visitors might examine the colour specimens arranged for their inspection.

## STEREOSCOPIC PHOTOGRAPHY.

[Paper read before the London and Provincial Photographic Association.]

I TRUST I may be excused for once more bringing this time-worn subject before your notice, my object in doing so being, if possible, to add a few more recruits to the stereoscope and stereoscopic photography. Since my conversion to this branch of our photographic art, it has become more than ever a matter of surprise to me that so few amateurs have added to their stock of apparatus a stereoscopic outfit. I am afraid this is largely due to the fact that there are but few who ever take the trouble to dive into the difficulties, real or imaginary, that are said to surround stereoscopic work. There can be no two opinions—at any rate, amongst those of us who possess binocular vision—as to the enhanced value given to a photograph by its being represented in all the solidity and reality that stamp the good stereogram. Nothing but colour would be wanted to complete the illusion that we were really looking at the object itself, and not its reproduction only, if the size were for the moment forgotten. I am convinced that, if it were well understood that there is practically no more trouble involved in the taking of a stereographic picture than in the making of an ordinary quarter-plate, the present disparity in the popularity of the two sizes would no longer exist. I propose to offer a few hints that I hope will help the would-be stereoscopist, and will deal

first with the selection of size of plate. I strongly recommend that known as double quarter-plate ( $6\frac{1}{2} \times 4\frac{1}{2}$  inches). The selection of this size enables the stereoscopist to rid himself of the constant fear that he will be unable to obtain supplies anywhere he may happen to be, especially if touring. He will find that he can use two quarter-plates as readily as the uncut  $6\frac{1}{2} \times 4\frac{1}{2}$ , which can be purchased anywhere. Further, if he finds a subject that his experience or instruction teaches him would not make a good stereogram, he has the possibility of making an ordinary quarter-plate negative by uncapping one lens only, reserving the other plate for a similar opportunity to offer. This size also allows margin for trimming the print, either in the sky or foreground, to suit the composition of the subject. This, in practice, will be found invaluable, as the best of us, especially when taking snap-shots by the aid of a finder only, do not always get our picture balanced exactly as we should like; and with the older size of stereo plate,  $6\frac{1}{2} \times 3\frac{1}{2}$ , we should have to put up with what we had got, the margin for trimming being *non est*. Further, in the latter size of plate there is no practical advantage in the additional  $\frac{1}{2}$  inch base-line measurement, as it will be found that the finished stereo print should not exceed 8 inches square, the extra length consequently having to be trimmed away; another disadvantage is that this size is rarely stocked by any photographic dealer. I do not wish to be understood as recommending that two quarter-plates be used in preference to the uncut plate, as the latter is more convenient in practice; I merely put forward the method as the best when there is likely to be any difficulty in obtaining supplies.

The size of plate having been decided upon, the next, and one of the most important requirements, is a good camera. This may be either a hand or stand camera; but, whichever pattern be selected, I strongly advise it having means for focussing. There are now on the market many patterns of combined hand or stand cameras which are very portable and compact. I personally use one of my own design, which may be used indiscriminately as a hand or stand camera. It is, as you see, somewhat less bulky than an ordinary quarter-plate magazine camera, with the exception that the slides are a separate package, and is well suited for ordinary snap-shot photography, which forms four-fifths of my work.

Whatever the pattern camera selected, it must have a good shutter, capable of giving time or instantaneous exposures, and my own choice is a Thornton-Pickard Behind lens pattern with adjustable centres to panels. It would also be advisable to have a safety blind fitted, as in this pattern the cord flies back into the shutter after setting, a most desirable detail, as bitter experience in the catching up of the cord has often taught me. There are various patterns of magazine hand cameras built for stereoscopic work, but there are many objections to the type, the first point to remember being that you have the equivalent of two dozen quarter-plates to carry about instead of one dozen. You have no focussing screen, and often no rack and pinion. This latter point is most important, as the best stereoscopic effect is obtained with objects often within the infinity focus of the lenses. Also to the changing movement of a magazine hand camera has to be added means for removal of the septum or dividing chamber before the plate can be dropped into the well. This point, of course, does not apply with bag-changing cameras. On the whole, I think dark slides are much to be preferred, although somewhat slower in use.

To complete the outfit, a well-matched pair of lenses is necessary. These must be matched, not only as regards their focus, but as regards their intermediate apertures, the latter error being more common than is usually credited. Nothing is more annoying than to find that, when, say, you have stopped both lenses down carefully to *f*-16, one half of your negatives develops much denser than the other, with consequent unevenness in the resulting prints. Either the wheel or the Waterhouse diaphragms are the least liable to error, and of the two I prefer the wheel. However, nothing can equal a good Iris for comfort in working, subject to the proviso that its apertures be accurately engraved on both lens mounts. Respecting the type of lens preferably to be used, I must confess that I see nothing in stereoscopic photography that differs sufficiently from other forms of photography to influence the selection of lenses. I advise the purchase of the best lenses that the depth of one's pocket will permit, remembering always that we may elect to enlarge one of the two quarter-plate pictures that form our stereoscopic negative, just as we should enlarge any other particularly successful quarter-plate negative in order to see it to best advantage. Therefore it is inadvisable to purchase cheap lenses unless obliged to. I have frequently noticed the recommendation of landscape lenses for use in stereoscopic work, but for what reason, excepting price, I am quite at a loss to see. My own experience points to the fact that architectural subjects, street scenes, &c., will form a large element of our exposures, and certainly it is not here that the landscape lens will shine.

The question of suitable focus for our lenses is one that need not cause much thought, practically any focus that would be suited to quarter-plate hand-camera work will do equally well for stereoscopic work, an abnormally wide-angle lens should, however, be avoided, as a good proportion of our most suitable work will be fairly close to the camera, and strained perspective is well shown up in the stereoscope. All stereoscopic cameras should be fitted with a spirit level, as no deviation whatever from the perpendicular can be permitted. Amongst the subjects



best suited to stereoscopic treatment may be classed architectural work, street scenes, yachting and shipping studies, landscapes when not embracing too large an area, and flower studies. I venture to assert that no photograph, however well taken with one lens only, of a bunch of flowers can compare with even a very moderate rendering of the same bunch taken stereoscopically. You can look into the very petals of the flower, measure its area and gain an accurate idea of its beauty. The important point of separation of the lenses should here be considered, for very near objects, such as the flowers before mentioned, the centres may have to be closed down to as little as  $2\frac{3}{8}$  inches to avoid exaggerated relief, whereas, for objects at a considerable distance from the camera,  $3\frac{1}{2}$  inches would not be excessive, and in extreme cases, where the view is very distant I have known, of exposures being made with either lens from two distinct standpoints, on the one view. I find, however, that for all-round work out-of-doors 3 inches is the best working separation, and is one that will not show too great a difference in the amount of subject on the respective halves of the plate. No stereoscopic camera should be purchased that does not give the power of altering the centres of the lenses, it is in my opinion quite as important as being able to alter the speed of the shutter.

Having now dealt with the most important features that should be present in the stereoscopic camera, I propose to consider the actual making of the Stereogram. I suppose there can be but few photographers who have not at some time or other examined a batch of stereoscopic prints, and this examination will have undoubtedly revealed a fault which is all too prevalent, viz., snowiness, an effect which is decidedly out of keeping when looking at a landscape with trees in full foliage. The cause is almost always under-exposure, combined with over-development, or may be due to the latter cause alone. The remedy is obvious. In stereoscopic photography, more perhaps than in any other branch of our art, correct exposure is a desideratum. Even an exposure which would be considered too much for ordinary work will often turn out in the stereoscope to be all that could be desired; therefore the stereoscopist will be well advised, if bent on using his camera for snapshot work, to purchase as rapid a brand of plates as possible, and thus minimise his risks of under-exposing. If in spite of this he finds he has an under-exposed negative to deal with, it will undoubtedly be policy to push shadow development to the utmost, keeping density as much in the background as possible and relying upon the power of judicious printing, and, after sunning off, to soften things down. I am always inclined to look upon the actual development of the negative as a somewhat mechanical operation and of quite secondary importance to the question of exposure. This especially applies in stereoscopic work, and, if an approximately accurate exposure has not been given, no amount of after-treatment of the plate that I know of will prevent that fact becoming known when the resulting print is viewed in the stereoscope.

A method which I have often adopted when dealing with a negative that has been strongly lit and perhaps somewhat over-developed, and which consequently gives a harsh print and the objectionable snowiness, is to reconvert the deposit forming the negative with the following solution:—

Potash ferricyanide .....	100 grains,
Potash bromide .....	100 "
Water to .....	10 ounces,

into which the negative is immersed (after being allowed to dry in the usual way) until acted upon right through to the glass, washed for twenty minutes in running water, and dried as usual. It will then be of a rich deep yellow colour, and will print exceedingly soft.

The next point to consider is trimming the print. This usually takes so much description as to give the impression, to one who has never attempted it, that it is an extremely complicated and tiresome operation. It certainly is an operation requiring more care than the trimming of an ordinary print, for the reason that, unless absolute accuracy is observed in trimming both prints exactly through the same baseline, the effort to merge them in the stereoscope will cause great distress to the eyes. It must also be noted that, on looking at the print as it faces you waiting trimming, the picture on the right hand will be that taken by the left lens, and *vice versa*, consequently it becomes necessary to reverse when mounting, in order that the right print on the mount be that one taken by the right lens, and again *vice versa*. All this is obviated, of course, if the negative itself has been cut and transposed, but I do not think, excepting when printing on a wholesale scale, that this method will recommend itself to the average amateur. The system of working which I invariably use, and which I propose to show to-night, is to turn the print over on its face, and mark on the back the letters *a* and *z* in their proper positions. I then take my cutting shape, which measures  $6\frac{1}{2} \times \frac{3}{4}$ , place it on my print, and note that an object appearing in the foreground of both pictures is exactly covered by the edge of the shape. I then trim all round the four sides of the shape without moving it, to facilitate which, incidentally, I may recommend a revolving cutting table; then, without lifting the shape off the print, I slide it along to the left, thereby uncovering the right print, until I reach the mark created by the septum in the camera; I draw the knife down again and one print is finished. Still, without raising the shape, I slide a trifle more to the left, and cut

away the septum mark altogether, and the other print is then ready for mounting. This description seems somewhat lengthy, although, as a matter of fact, the actual operation of trimming is performed well under one minute. It is, perhaps, hardly necessary to remark that the cutting shape used must be absolutely true on all its sides, and such a shape, when once secured, is well worth taking great care of. The size mentioned,  $6\frac{1}{2}$ , allows three-sixteenths of each side of the length of the plate being absorbed by the rebate of the dark slide, which allowance should be ample in well-made apparatus.

Having trimmed a batch of prints, the next operation is mounting; here there is undoubtedly room for a diversity of opinion as to whether the wet or dry method is the best. I propose to show you the method I always adopt: Firstly, all prints, previously toned, dried, and trimmed, are gathered together in pairs and placed in a half-plate granitine dish to soak for about five minutes; the prints marked *a* on the right side of the dish, one on top of the other, and those marked *z* on the left; after soaking they are gathered up in two separate piles, and placed each pile face down on a piece of clean glass, *a* prints on the right, *z* prints on the left, and superfluous water duly drained off. Then, having the mountant ready, either starch on one of the white dextrine mountants, of which so many brands are now on the market, and a good hog's-hair brush about one inch in width, also two pieces fluffless photographic blotting paper such as "Robosal," I blot off the top pair of prints as they lay on the pile and apply the mountant. I then pick up the print marked *z* and place on the mount, with its inside edge against a pencil dot which I have previously marked on the exact centre of the mount. I do not trouble at that moment to press the print down, but proceed to pick up from my pile the fellow print marked *a*, and place in position on the mount with its edge touching the other, which, being done, I place my piece of dry blotting paper over the whole, and rub down fairly heavily. The final finish I adopt is by burnishing with a nickelled roller-burnisher, heated by a blow-lamp burning methylated spirit, the cost of which was 2s. 6d.

It is, perhaps, needless to remark that, if the gelatino-chloride process is used for producing the prints, they must be well alumed. It will be observed that there is always a difference in the actual amount of view showing on either print; this difference is easily understood when it is remembered that, although the two exposures are made simultaneously, the actual point from which the view is taken by the two lenses varies with the amount of their lateral separation. If the correct separation has been used between the lenses according to the distance of the object photographed, the method of trimming I have previously mentioned will prove perfectly satisfactory, no additional marginal trimming being required, and it will be found that there will be somewhat more of the view included on the left side of the right picture than on the left picture and *vice versa*.

The prints, when mounted, will vary in the centres from  $2\frac{1}{2}$  to  $3\frac{1}{2}$  inches, but nearly every individual will find the most comfortable centering will not exceed three inches. As far as printing surfaces go, our choice will have to be somewhat limited, and unquestionably the best media will be one of the glazed gelatino-chloride or albumenised papers. I have seen some fairly satisfactory results both on carbon and glazed bromide papers, but do not think either of these processes quite equal to gelatino-chloride for stereoscopic work. Anything in the nature of rough or semi-rough surfaces should be avoided, as the effect is exaggerated in the stereoscope. Perhaps the best method of viewing a stereogram is to make a transparency on either glass or celluloid; there is no very special difficulty in this to any one familiar with lantern-slide making, the only requirement other than any lanternist would possess being a special printing frame with aperture for one print only, but length sufficient to move the slide and negative laterally in order to obtain the images in their correct relative positions.

For viewing the finished stereogram the American form of prism stereoscope is good and very cheap, but unquestionably the best effect is obtained in a stereoscope fitted with a pair of achromatic lenses. Mounting and choice of mount used must always remain largely a question of taste. The mount chosen should always be subservient to the print, and the glazed yellow abominations so much in vogue will altogether destroy the beauty of any stereoscopic print. Further, the surface of glazed mounts is easily damaged, and mountant will get into the wrong place somehow. I prefer a Bristol-surfaced mount, off which can be sponged without damage any trace of matter in the wrong place, and I usually use a rich brown, which harmonises particularly well with chloride tones. If a space of about one-eighth of an inch is left between the prints when mounting, a framed effect will be obtained when viewed in the stereoscope, and the same effect is obtained by the use of cut-out mounts. It must not be forgotten, however, that, if the desired width of centres is not to be interfered with, the size of the prints must be slightly reduced to allow for the one-eighth of an inch or so taken up by the division between the two openings of the cut-out. The question of developing and toning hardly comes within the province of this paper, as, with the sole proviso that the density of the negatives should invariably be kept well under, especially if intended for chloride printing, to avoid the snowiness previously commented upon, there is practically nothing that requires any departure from the ordinary every-day practice of photography.

J. E. HODD.



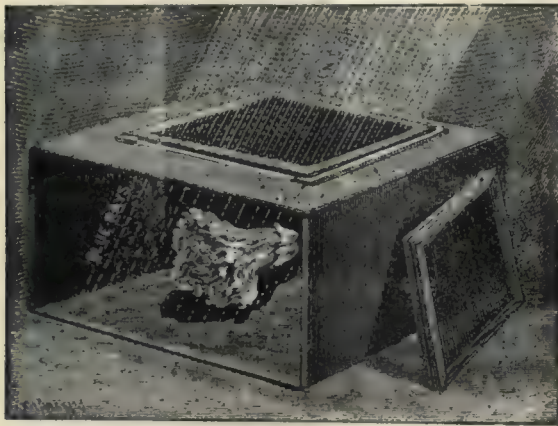
## THE CHROMO CAMERA.

*[Scientific American.]*

THE chromo camera is the name given to a new apparatus for the study of colours and coloured lights. It consists of a cardboard box measuring  $6 \times 6 \times 3\frac{1}{2}$  inches, and open at one end. The box or camera is lined with black cloth, and the interior is lined with dead-back paper. A cover, also black, closes the open end. On one side is an opening  $3\frac{1}{2} \times 1\frac{1}{2}$  inches, the lower edge of the opening being 1 inch from the bottom of the box. With the box are three "tinters," such as are used in colour-projection lanterns. These tinters are made by enclosing a film of coloured gelatine between two lantern-slide covers. A slide mat is placed over the film between the glass covers, and the whole is bound with paper on the edges. One of the tinters is a deep orange-red, one is a yellowish green, and the other is light violet; these three tints in a colour-projection lantern giving a white light on the screen. There should also be with the camera a number of squares of coloured papers, such as are sold in packages of assorted colours for use in kindergartens, some coloured fabrics, ribbons, &c., natural or artificial flowers, and a sheet of stiff white cardboard  $5\frac{1}{2} \times 6$  inches.

The chromo camera is the invention of Mr. Charles Barnard, of New York, and was first used by him in his school lectures on the study of sense impressions of colour. The colour camera is used to examine the colours of objects placed in a coloured light, and to enable the student to mingle diffused white light and a coloured light in various proportions. The invention is here described for the first time, and is freely dedicated by the author to the use of students and teachers.

To use the colour camera, place a table close to a window having a north or sky light, free from reflections from buildings or trees, and cover the table with black cloth or paper. Remove the cover from the box, and place it on the table with the opening uppermost, and with



the open end away from the light. The side curtains should be drawn together to mask the light from the eyes, leaving only a space in the centre a little wider than the box. Draw the shade down to about on the line of the eyes when seated behind the table. Two or three persons can sit at the table, where they can see the interior of the box. The teacher or operator should stand at one side of the table behind the curtains. Here the tinters, coloured papers, &c., are in easy reach.

The box is now fully illuminated by the light that falls through the opening and by the reflected light that enters the open end. Place a sheet of red paper in the box. It is plainly visible. Now lay a book over the opening in the box. The red paper now appears to be almost black in the dark box.

Remove the book and paper, and place the red tint on top of the camera near the back. Slide it slowly forward towards the light, and let the student watch the interior of the camera. When the glass fits the frame and covers the opening, the interior of the camera appears to be a very dark red, the colour being faintly visible near the edge of the opening at the back, and fading away to dead black inside the camera. Place a sheet of white paper in the camera, and it appears a bright pink. The fingers are rosy, and a white flower is pale red. The effect will be improved by placing the cover of the box on edge just above the opening. Remove the red tint, and the paper is again white. Place the green tint over the opening, and the paper is a pale grass-green. Place the violet tint on the box, and the paper is violet.

What has been accomplished? The light contains all colours. The tinters act as strainers. They shut off or strain out all colours except one. The paper capable of reflecting all colours (white) finds only one, and therefore reflects that one and no other. It would reflect it perfectly were it not for the fact that some white light is reflected into the back of the box and mingles with the coloured light. It is this that causes the paper to appear pink under the red tint.

Remove the white paper, and put the red tint in place. Put a red paper or red flower in the camera. It appears a deeper red. Now remove

the cover from the top of the box, and let the operator hold the sheet of white cardboard upright on the edge of the box. Now gently tip it forward, and at the same time move it backward. It acts as a reflector, and throws more white light into the box, and the red flower changes its shade of red, becoming lighter in shade as more white light mingles with the coloured light.

Remove the flower, and place a sheet of pale yellow paper in the camera. It is now a deep golden orange, and, by the aid of the reflector, the colour can be made to change from yellow to orange. The same effect can be produced by sliding the tint back to allow a thin sheet of light to enter the opening. Remove the yellow paper, and place a sheet of green paper in the camera. It appears neither red nor green, but yellow. The eye is now receiving two sensations, a sensation of red from the red light in the camera, and a sensation of green from the green paper partly illuminated by white light that contains green. The compound sensation we call yellow. By sliding the tint backward, or using the reflector, paper can be made to pass from green to yellow through many beautiful tints and shades. Place a white rose in the box, and we shall see a pink rose with yellow leaves. Place a blue flower or blue paper in the camera, and we shall see a purple flower or paper.

Put the green tint on the camera. Now yellow paper is olive green, blue paper is Nile green, bright red paper is dark brown. A red rose is almost black-brown, while its leaves are a vivid green. Slide the tint forward and back to observe the colour change. Try the violet tint, and under its violet light every colour will suffer endless changes as the proportion of white light is allowed to mingle, by means of the reflector, with the coloured light.

These experiments, novel and beautiful as they are, can be greatly improved by using the colour camera in full sunshine. Place the table close to a sunny window in the full sunlight, the best time being between twelve and three o'clock. Draw the shade down till its shadow just touches the back of the camera. Now the shades of the camera will fall on the black cover of the table, and upon it will be a square of sunlight from the opening in the box, this square of light being partly within the box, according to the position of the sun. By tilting the box up at the back it can be thrown inside the box; but, if the curtains are closely drawn, and the other windows are darkened, the effects can all be seen on the table outside the box.

Now all the experiments can be repeated with the most brilliant results. With the red tint, a sheet of blue paper appears a wonderful purple, green is a splendid gold colour, and yellow a red orange. Every colour, single or compound, will appear in marvellous brilliancy, and the students will be lost in wonder at the endless combinations of tint and shade of flowers, paper, and other materials, under the magic of two lights, white light and a coloured light.

Take a piece of cardboard and cut in it a small cross, star, or other figure. Lay this over the red tint, and in the camera we shall see the figure in vivid red on a black ground. Place a green paper in the camera, and the figure seems to shine with an orange-yellow light. Try each tint in the full sunshine, and a great variety of beautiful effects will be observed.

Next take the colour camera to a good north light. Place a sheet of white paper on the bottom of the box, and upon this lay a penknife, rule, pencil, or other small object. Put the object about an inch from the front of the box. The light that falls into the open box causes the object to cast a shadow on the white paper. Now place the violet tint in top of the box, next to the front. Now let the operator move the tint slowly backward till it covers the opening, while the students fix the attention upon the shadow in the box. When the opening begins to be closed by the tint, the shadows deepen. A faint violet fringe appears on the edge. This grows deeper and deeper as the violet twilight in the box decreases. Suddenly another colour appears. The shadow suggests yellow, and just as the tint closes the opening the grey shadow turns to a pale ghost-like yellow. By using the reflector the shadow can be made to turn from grey to yellow at will. With the red tint the shadows are green, with the green tint they are red; in each case the shadow is of the complementary colour of the tint.

Students and teachers will find the chromo camera both useful and entertaining in the study of colour. Such experiments tend to train the eye to a finer appreciation of the distinctions of colour, hue, and shade, and such training cannot fail to add to our enjoyment of nature and art.

## COMPOSITION AND "BREADTH."

In the course of a series of articles on "Points in a Picture" which he is contributing to the *Morning Herald*, Mr. Seymour Lucas, R.A., remarks that, having grasped the meaning of a picture, the next point we may notice is the composition. The grouping of the persons or things depicted should give an effect of unity or totality to the picture. A great painting should be thoroughly homogeneous. It should be harmonious in its idea, and dominated by a motive. No matter how many figures may be introduced, or how many minor interests may be involved, they should all be focussed together by the leading idea. In one word, a picture should be "broad." The word, it may be, as applied



to art, partakes of the nature of slang, though the expression is Biblical. Strictly speaking, it refers to the prominence given to the main idea of the work, and the due subordination of the inferior thoughts and accessories. The recent ornamentation in St. Paul's Cathedral destroys, in the opinion of some, the grand breadth of Wren's work. To express a great thought clearly, and with due regard to its weight, you must not intrude smaller and more vulgar ones. The opposite of breadth is flinching attention to trivial additions and prettinesses.

The decline in the great art of Italy in the seventeenth century is nowhere more plainly apparent than in this respect. The effect of what might be a fine group representing, let us say, the Holy Family, is entirely marred by the gratuitous introduction of a child teasing a cat, or something equally silly and out of keeping with the thoughts that such a subject ought to inspire. An artist must know how to suppress as well as how to give prominence. It may be quite possible to have a picture, well composed as regards outline, broken up and presenting a distracting and irritating effect upon the vision, by excess of emphasis in parts which ought to be more lightly touched.

What good painters we all should be if we only knew when to leave out detail! The overcrowding of a picture is a fault too often committed by the best of us. By the judicious suppression of detail value will be added to a subject as effectively as by strength or softness of shade and light. The earliest and crudest examples of art lack breadth because they show the same elaborate care and finish in all parts of the subject. All the figures are on the same plane, all are finished with the same degree of elaboration and care. Nothing is more striking than this feature in the painting of artists in the early schools of the Renaissance; and its defect is obvious. The eye is distracted, not knowing where to rest, it wanders vaguely over the whole composition and derives no assistance from the skill of the painter. Like the man who bought a dictionary to read as light literature, the spectator never seems to get to the plot. The modern reaction from this is to be found in the work of what is known as the impressionist school. And it must be acknowledged that, in so far as the exponents of this school have emphasised the defect, they have done good service. The danger of impressionism, as it seems to me, is the tendency to exaggerate subordination, and to leave too much to suggestion.

"Please will you tell me," asked a child at a wax-work exhibition, "which is Daniel and which is the lion?" "Whichever you like, my dear," replied the showman; "you pay your money and take your choice." So it is with impressionism. "What is the exact sentiment of that *Nosturne*?" inquires the fair beholder. "Madame, you buy the picture, and interpret it to your liking," is the answer of the obliging dealer.

Nor does it always follow that great breadth is obtained by this vagueness. As Macaulay pointed out, the definite, clear-cut descriptions of Dante's *Inferno* are as powerful and broad as the shadowy, vague, and terrible suggestions in the *Paradise Lost*. We will venture to say that the works of the Dutch painters, or of Meissonier, with their wealth and elaborate detail, possess more real breadth than many of the impressionist pictures. If one were to magnify Meissonier's pictures until his figures assumed the proportions of life, you would still find them to be broad and masterly in appearance. But this quality is, as a rule, very rare in miniature painters. The tendency is to over-elaborate, and become photographic. It is much more common to detect skill in the suggestion of duly subordinated detail in the painters of big pictures. There are, for instance, more large pictures which we could reduce to miniature size without losing subtlety than small pictures which we could enlarge to the proportions of life without destroying breadth.

Great breadth by no means implies baldness. Look, for instance, at Turner's *Chain of the Alps from Grenoble to Chamberi*. Here you get breadth with a tremendous feeling of space—acres of vineyards, gardens, and trees, not to mention the small town or village in the middle distance.

#### PHOTOGRAPHY IN THE TROPICS.

To the June number of the *Camera Club Journal*, Mr. J. O. Neumann contributes the following useful notes on photography in the Tropics. Some of our readers may find them of assistance:—

"*Outfit*.—I found Imperial Sovereign plates answer capitally. Each packet should be packed in a soldered tin. The plates should be backed. Leather should be avoided, as the dampness spoils it, insects and other creatures eat it. The camera should contain only polished wood and brasswork or metal; the latter must be kept well greased with oil or vaseline.

Avoid indiarubber, it gets 'tired' and useless very quickly. No printing paper will stand the climate, so take chemicals and make your own—ferro-prussiate paper for preference. Pack all outfit in a black tin trunk with an overlapping, well-fitting lid, and secure it with a chain and letter-lock in addition to the ordinary lock. Take plenty of permanganate of potassium. Provide yourself with porcelain trays; glass breaks too easily, and others will warp and split at the edges.

"*Exposures*.—I found that the shortest possible exposures between mid-day and two p.m. gave excellent results. Until ten a.m., and often

later, the exhalation of humidity from the soil, caused by the nightly rains, will render photographic attempts more or less precarious.

"*Developing*.—This can only be done at night, and in a part of the house opposite to the one on which the moon is shining. Solutions must be made fresh each day. It is troublesome to make them at night on account of the insects which are attracted by the light, and which come around you in hundreds; it is therefore advisable to make them by day, and at night to place the trays on a few lumps of ice, or place the bottles of solutions in a basin containing the ice; the latter must not on any account be put into the solutions. See that there is a good current of air coming into the room, as it prevents frilling. A good plan is to stand the ruby lamp inside a lantern. I always place water in the bottom of the ruby lamp.

"*Printing*.—Wash your trunk above alluded to well inside and out with a solution of permanganate of potassium, make your ferro-prussiate paper, place it inside the box to dry, and cover the whole with a couple of rugs or blankets. Cut up the paper at night and place it between the leaves of a book ready for use in the morning. The paper prints quickly enough on the Equator.

"*Negatives*.—Clean out the boxes in which they come, and see that there are no traces of insects' eggs. Place a little camphor in muslin at the bottom, replace the negatives, paste all over with cloth or paper, and saturate this covering with strong arsenic solution.

"There are three things one must always encounter and guard against in the Tropics, viz.:—

- "(1) Excessive dampness;
- "(2) Excessive light and absence of light-tight buildings; and
- "(3) Insects.

"The dampness pervades everything, and combined with heat and light makes a formidable enemy.

"No one who has not been to the Tropics has any idea of the number and variety of insects which are to be met with in this world of ours, nor of their propensity to get into the tightest corners, there to propagate their species, which in turn will devour films, &c.

"Take some black paint and paint the inside of your camera every month, and test for holes."

#### FLOWER AND FRUIT PHOTOGRAPHY.

An Exhibition of photographs of fruit, flowers, and allied subjects will be held in connexion with the Autumn Flower Show at Glasgow in September. Silver and bronze medals are offered in a number of classes. Schedule and entry form may now be had from Mr. John Coats, 160, Hope-street, Glasgow. The Judges are Messrs. D. Dewar, John Stuart, and A. Watson.

The following are the conditions and classes:

##### CONDITIONS.

1. Six different pictures to be entered in each class, except as stated.
2. Pictures to be mounted on stiff mounts, but need not be framed.
3. Either direct prints or enlargements may be sent, and any printing process may be employed.
4. Every reasonable care will be taken of exhibits, but the Society will not be responsible for loss or damage.
5. One silver and one bronze medal will be placed at the disposal of the Judges in each class, from 1 to 5.
- Both negatives and prints must be entirely the work of the exhibitor.
6. Each picture must bear on the back of the mount or frame, title of picture and process.
7. The decision of the Judges shall be final. Pictures will be received, carriage paid, at St. Andrew's Hall, Berkeley-street, between 8 and 9 p.m., September 2, from ten o'clock, till Tuesday, September 5, at eight p.m.
8. If to be returned by parcel-post, stamps must be enclosed in a letter addressed to the Secretary.
9. Exhibitors restricted to one entry only in each class.

N.B.—Entries must be sent to the Secretary not later than August 31. No entrance fee will be charged, but exhibitors are not entitled to free admission to the Exhibition.

##### CLASSES.

1. Arrangement of Cut Flowers.—Cut flowers arranged for decoration in vases, jars, baskets, &c.; also bouquets.
2. Indoor Plants.—Specimen plants (or groups of plants) in conservatory or room.
3. Fruits.—Fruit on the tree, or arranged in dishes.
4. Picturesque Spots.—Views in ferneries, rockeries, conservatories, bits in gardens, borders, climbing plants on walls and arbours, specimen shrubs, trees or herbaceous.
5. Landscape Gardening (three pictures only).—Views in parks, large gardens and wooded estates, ornamental waters, &c.
6. Special prizes of 3l., 2l., and 1l., offered by Messrs. Lizars, of 101 and 107, Buchanan-street, Glasgow, for one set of six photographs taken by exhibitor with the firm's 'challenge camera.
- N.B.—Competitors entering for Class 6 must send separate prints, which may be duplicated in previous classes.



## PRACTICAL NOTES ON SOME IRON PRINTING PROCESSES.

## PART V.—SOME LITTLE-KNOWN PROCESSES.

## FERROCYANIC PROCESS OF OBERNETTER.

This process dates back to about the year 1865. Paper is coated by floating on the following bath:—

Hydrochloric acid .....	1 part.
Ferric chloride solution (sp. gr. 1.5) ..	1 "
Copper chloride (crystals) .....	10 parts.
Water .....	100 "

Exposure is given long enough to show a faint image. The paper is then to be removed at once, and floated on the following developing bath:—

Potassium sulphocyanide.....	10 parts.
Sulphuric acid .....	1 part.
Water .....	1000 parts.

To this is added 15 parts of the mixture used for floating and sensitising the paper.

The theory of the process is somewhat as follows: Light reduces the ferric chloride to ferrous chloride. When immersed in the developer, insoluble copper (sulphocyanide) is deposited on the parts converted into ferrous chloride. If, however, the undeveloped print is exposed to moist air, the ferrous chloride reverts to ferric chloride, and the image is lost. Hence the need for prompt development.

Developing at first should be by floating, but when the image is well out, the paper then may profitably be immersed. After development the print must be well washed. It may then be toned, thus:—

*For Red Tones.*—Immerse in a ten per cent. solution of potassium ferricyanide.

*For Purple Tones.*—

Ferric chloride .....	1 part.
Hydrochloric acid .....	2 parts.
Ferrous sulphate .....	2 to 2½ "
Water .....	10, 50 "

The last-named bath will give a range of tones from red through violet and purple to green-black, according to strength of bath and duration of immersion. A final washing in slightly acidulated water completes the process.

## INK PROCESS OF POITEVIN.

This process depends upon the fact that ferric chloride renders gelatine insoluble, but ferrous chloride has not that effect, and that light converts ferric into ferrous chloride. Hence, if paper be coated with gelatine and ferric chloride, printed under a negative, and then placed in warm water, those parts acted on by light (i.e., the shadows of the picture) are converted from ferric to ferrous salt, and the gelatine is soluble. Thus, if the gelatine contains a pigment, we get a negative print from a negative. Hence the process is usable for copying tracings, &c., yielding a positive from a positive direct.

*Ink Process.*—Poitevin's Pigment Process.—

1. Iron perchloride .....	3 parts.
Citric acid.....	2 "
Water .....	100 "

Float the paper for two or three minutes; dry quickly in the dark. Print under a positive. Develop by immersing in a weak solution of glycerine, containing Indian ink in solution. The ink will only affect the parts protected from light by the positive.

2. Dissolve one ounce of gelatine in 15 ounces of water, and add 100 grains of Indian ink, and mix very thoroughly. Float the paper upon this mixture while warm for three minutes. Dry quickly. Sensitise in the following bath by immersing until the paper is limp:—

Tartaric acid .....	7 parts.
Iron perchloride .....	24 "
Water .....	240 "

Dry again quickly in the dark. Print under a positive and develop by immersing in warm water.

## AMMONIO-FERRIC-OXALATE PROCESS.

Paper is coated by floating or brushing with

Ammonio-ferric oxalate .....	1 part,
Water .....	8 parts,

quickly dried in the dark. It will keep good many months. It is exposed until a very faint image is seen, then developed by brushing over with a five per cent. solution of potassium ferricyanide, washed and dried.

*Ammonio-ferric oxalate* may be prepared in the following way: To 5 ounces of water add slowly 3 drachms of sulphuric acid, then add 5 ounces of ferrous sulphate in powder and dissolve by gentle heat. Now add 2 drachms of nitric acid diluted with 1 ounce of water. Boil gently, until the mixture turns red; set aside to cool and add ammonia until a

precipitate ceases to form. The precipitate is iron peroxide. This is now collected and washed once or twice with boiling water and kept in a wide-mouth bottle in a moist pasty state.

Ammonium oxalate must now be prepared:—

Make a saturated solution of oxalic acid, and add ammonia until the solution is neutral. Evaporate and collect the crystals (am. oxalate).

Lastly, take of

Ammonium oxalate.....	437 grains.
Oxalic acid .....	886 "
Water.....	6 ounces.

Dissolve by gentle heat nearly to boiling and add iron peroxide to saturation.

Evaporate to crystallising point and collect the green crystals, and store in the dark.

## IRON-CITRO-OXALATE PROCESS.

The following method has been suggested as a simple way of obtaining prints from a negative.

Prepare the following solutions:—

A.	
Silver nitrate .....	25 grains.
Water .....	1 ounce.
B.	
Iron citrate.....	45 grains.
Iron oxalate .....	25 "
Water .....	1 ounce.

Mix A and B, and permit any precipitate to subside. Coat paper by brushing with the supernatant clear fluid. Dry in the dark, expose under a varnished negative, and wash in running water, giving a final wash in a bath containing one per cent. of ammonia.

REV. F. C. LAMBERT.

## THE SESSION'S WORK OF THE PRACTICAL SECTION OF THE EDINBURGH PHOTOGRAPHIC SOCIETY.

(From the Society's Transactions.)

In dealing with the session's work, I have thought it advisable to run over briefly the principal points connected with the various subjects which have come under our notice.

The camera itself first demanded attention, the popular sizes of which are quarter-plate, half-plate, and whole-plate, the average focal lengths of lenses necessary being 6 inches, 8 inches, and 10 inches respectively, lenses of 10 inches for cabinet and 12 inches for whole-plate being preferred for general work.

The focal length of a lens is the distance from the single lens (or approximately from the diaphragm in the double lens) at which a distant object is focussed on the ground glass, and the diameter of a lens, known as its full aperture, is numbered proportionately to this focal length. The full aperture of a lens of 16-inch focus and a diameter of 2 inches is f-8. The full aperture of a lens may not give the objects in all the different planes in focus at the same time, i.e., when the foreground is sharp, the middle distance and distance will be out of focus, and metal plates or other contrivances are inserted in the lens to make the working aperture smaller. This has the property of rendering in focus or sharp a greater number of planes, but decreases the light in proportion. These metal plates are known as stops, and are numbered in the proportion which their diameter bears to the focal length of the lens. F-8 is one-eighth part of the focal length of the lens, and is 1 inch in diameter in a lens of 8-inch focus, and 2 inches in a lens of 16-inch focus.

The size of a picture at a given distance is proportionate to the focal length of the lens. If we have a certain picture on a quarter-plate with a 6-inch lens, we will have the same picture on a whole-plate with a 12-inch lens, the whole-plate being exactly double the linear measurement of the quarter-plate (4½ inches and 8½ inches). The depth of focus at the centre of all lenses of the same focal length is the same, and depth all over is decided by the covering power of the lens, i.e., the ability to render sharp all the objects in the one plane. Covering power may be said to include both width of angle and flatness of field. The term flatness of field only might be used. The depth of lenses decreases with the increase of focal length, hence the necessity of employing short-focus lenses for speed work in snap-shot photography; but long-focus lenses of the same quality have greater covering power, and, if the covering power of a short focus lens is deficient, an equally good result may be obtained by employing the longer lens and using a larger stop (i.e., a stop of the same number). A truer perspective is obtained by using the longer-focus lens, and, as the depth at the centre of a lens is generally greater than is required, the employment of a larger stop does not interfere with the focus.

Summarising the foregoing, we find that—

1. All stops are numbered, and admit light proportional to the focal length of the lens.

2. All stops of the same number require the same exposure with all lenses for a similar picture.



3. The relative exposure of stops is as the square of their numbers. If  $f\cdot4$  requires 1 second,  $f\cdot8$  will require 4 seconds, and  $f\cdot16$  16 seconds.

4. Long-focus lenses are slower than short-focus lenses, because they require a smaller designation of stop to give the same depth of focus (approximately a stop of one diameter will give the same general definition with all lenses of the same quality).

Let us apply this, disregarding the increase of exposure necessary for increase in the breadth of the shadow in larger pictures, which factor is the only one to be taken into account when photographing all sizes with one lens.

Suppose we take our quarter-plate view with a 6-inch lens and  $f\cdot12$ , giving one second. We will require to use a 12-inch lens to obtain a whole-plate from the same point, and  $f\cdot24$  to give the approximate general focus, and our exposure will be four times as long. With a  $15 \times 12$  camera and 22-inch lens and  $f\cdot44$ , the exposure would be 14 seconds.

To come now to plates. This exposure of 14 seconds is seen to be too long for practical work. We may use a quicker plate and cut it down considerably, and I have found that it is possible to use much quicker plates, and still get the best possible result, for outside large work, than we would require for cabinet work. This is probably owing to the fact that, the correct exposure being relatively longer, the latitude is greater. Plates are of three different speeds—slow, from 40 H. & D. downwards, medium from 80, and rapid anything higher. Some makers number their plates with double these speed numbers, apologising for this by recommending a certain rapid developer. This is unfortunate, but a little studying of the numbers will let us know when the higher numbering is used. With a box marked special rapid 160, it is always safe to assume that the number is 80 in relation to other makes.

The features of slow plates are great latitude, rather, however, on the side of over-exposure, and a tendency to harden quickly, necessitating treatment early in development. Use for landscape work and copying medium plates, good latitude, rather softer, but producing plucky negatives. Use for dark landscape work, slow hand-camera work and seascape hand-camera work. It is essential that the quality of these plates be ascertained, as it is in this variety particularly that there is a tendency to *starve* the emulsion, giving thin, flat results.

The general rule in exposure is to expose for the shadows. Seascapes, open landscapes, or views taken from a height, where the light is necessarily top-light, all require very short exposures. The introduction of a rock or part of the shore in a seascape will lengthen the exposure considerably, the rock now constituting the shadow, giving the relief which was before obtained only by the hollows of the waves and sky shadows. Over or under-exposure in the finished picture is greatly a matter of appearance, and depends on the intensity or breadth of the shadow. A dark engraving will probably require three times the exposure of a light pencil drawing, not because we wish to represent the engraving as if it were a pencil drawing, but simply to meet the requirements of the case. One hundred lines drawn on a sheet of paper require a certain exposure; draw these lines together into ten broad lines, and the exposure necessary will have increased considerably. Therefore expose for the shadows. Inland subjects, especially landscapes in which there is heavy foliage, require very long exposures, owing to the heavy shadows and the fact that green is a very non-actinic colour. For such subjects isochromatic plates, used with a very light screen, will give much softer results and better gradation than is obtainable with an ordinary plate.

With regard to development, two or three points may be noticed. As the behaviour of all developers within certain limits is the same. We will take one (pyro ammonia) as our typical developer, referring, when necessary, to the special features of other developers.

The constituents of the pyro-ammonia developer are—

*Agents.*—Pyrogallol acid, ammonium bromide, sulphite of soda, and water, alkali (or accelerator), liquid ammonia and water.

Some formulae give the bromide in the accelerator, but I cannot see its value when so used, even when using the ammonia developer, and in combination with any other alkali it simply retards the special use of the alkali in under-exposure. An increase of pyro gives density. An increase of bromide retards the shadows. An increase of pyro and bromide gives strong contrasts, but requires a longer exposure. This developer is, therefore, useful for over-exposure. An increase of alkali flattens. An increase of ammonia, however, towards the end of the development does flatten, but simply hastens development, owing principally to the evaporation of ammonia from the developer. Weakening the developer, or putting the plates into water, retards the lights and allows half-tones to gain in strength.

Suppose we have three plates to develop. We commence with a developer slightly weak in alkali. We find one plate under-exposed, one correctly exposed, and one over. Put under-exposed plate into a dish of water, over-exposed one into pyro-bromide solution, make up developer to normal strength, and finish correctly exposed plate. If very slightly under-exposed, the water will very probably have given the necessary flattening to negative number two, and it may be finished in the normal developer. If not, ammonia may be added till the result required is obtained, or a new developer made up without any bromide in very stubborn cases. The use of water, however, in under-exposure is not sufficiently realised. It is advisable also, when "treating" negatives, to rinse the negative in water, in order to remove the developer and allow

the altered developer to begin its work *at once*. With regard to negative number three, pyro does not develop, but it preserves the image, and allows the bromide to do its work. (The negative may be left for a considerable time in this solution if necessary). Ammonia should be added sparingly till the image shows signs of development and the negative finished.

Small brown stains, caused by air bells, &c., on the negative while in the hypo solution may be removed by flowing the negative with sulphuric acid one in forty water.

Green fog may be removed by reducing solution, consisting of ferri-cyanide of potassium and hypo, and the negative may be also reduced by the same. Persulphate of ammonia is, however, preferable as a reducer for hard or chalky negatives, a feature of this reducer being the removal of density in the lights without eating out the details of the shadows. Intensification by mercury or staining by nitrate of uranium will increase the density.

Our attention was next called to hand-camera work. In studying lenses, we said that depth of focus at the centre depended entirely on the focal length of a lens and the size of its aperture, and that it decreased with the increase of focal length. If we have a 5-inch and a 7-inch lens, both of which give the necessary covering power, which, then, shall we use? If we wish correct perspective, use the longer lens; but, in so doing, we must sacrifice speed, as  $f\cdot8$  must be used with the 7-inch lens to give us the same depth as we get with  $f\cdot6$  in the 5-inch lens, and our exposure will be double the length. The question of depth, however, has become of late years a disputed question, very few of our workers inclining to ultra sharpness, and many preferring that the photograph should be sharp only in a single plane. This applies to photography generally, and, while our opticians are striving to produce a perfect lens, many of our best workers are doing their best work with the old spectacle or monocular lens.

Find out first what result you wish, and then work for it.

Focus in a single plane may be got by using a long-focus lens, or one with a very flat field, a large stop being used.

To obtain focus in the centre of picture only, use short-focus or round lens and large stop.

Diffusion all over is best obtained by focussing far forward, that is, with a greater distance between lens and ground glass than is required even for the foreground, and employing a small stop, or by employing a single "uncorrected" lens. The results, however, should be aimed at only when the elementary principles of photography are mastered. Afterwards, variety of result is more a matter of individual taste and thought than of fixed rule, and the method of obtaining such will generally suggest itself.

To return to hand-camera work, however. The usual lenses employed in hand-camera work are 5-inch for quarter-plate and  $7\frac{1}{2}$ -inch for half-plate, but slightly longer-focus lenses are desirable if great speed is not required. One-thirtieth of a second with  $f\cdot8$  on an 80 speed plate will give us an easily developable result with most subjects,  $\frac{1}{100}$  second may be taken as the arrested motion speed, and nothing less than  $\frac{1}{100}$  for subjects actually moving, unless very far away, using, of course, the fastest speed plates. In developing snap-shot photographs, an error is often made in assuming that they are very much under-exposed, and when correctly exposed plates are so developed a flat image is the result. Many of our snap-shot subjects, too, are those on which there is plenty of light, and the result to be aimed at is the acquiring of contrast, and not the registration of detail, of which there is a superabundance. With a plate which does not readily fog, a weakened developer, *i.e.*, a developer weakened with water, is safe for any hand-camera subject, finishing in this developer if found to be under-exposed, and strengthening in case of correct or over-exposure. If under-exposure is absolutely certain, the new developers—amidol, metol, rodinal—may be used, their general tendency being to flash up detail first and give density afterwards.

The method of varnishing the plate is to slightly heat before the fire and, holding the plate level, pour over it negative varnish till it forms a pool covering one-third of the plate; tip the varnish away from the corner held in the hand, then along the top, down the left-hand side, along the lower edge, and then drain into bottle at the right lower corner. Dry with the film side next the fire.

The printing processes are multifarious, but the chief and long-tried form themselves into three distinct groups—silver, carbon, platinum. The chief silver processes are gelatino-chloride and collodio-chloride, and for these processes, as regards present quality, the combined-bath gives the best result. A slight washing should precede the toning and fixing processes, and an extra fixing bath should be used. The preliminary washing ensures purity in the whites, and the extra fixing bath guarantees permanency, in so far as permanency can be got with this process, but neither in theory nor in practice can gelatino-chloride paper be looked upon as permanent. With care, however, prints in this process will last much longer than is generally supposed. For those who prefer a separate bath, I find that the borax bath or chloride of lime bath gives the best results. Sulphocyanide of ammonium results are too cold. It is still an open question as to whether either of these processes are better than the albumenised paper silver process, which they have replaced, but at present they are more popular.



The theory of carbon printing, which got its name from the fact that carbon was the first pigment used in the manufacture of this paper, is the non-solubility in hot water of bichromatised gelatine when affected by light, and its solubility when not so affected. A piece of paper is floated over a solution of gelatine, with which is intermixed a pigment or colour of some sort, and, when dry, it is immersed in bichromate of potassium solution. This, on being acted on by light through a negative, becomes insoluble in proportion to the amount of light which it has received. The fact that the image is on the front of the paper necessitates the washing away of the soluble gelatine from the back, and the print is for this purpose transferred to a temporary support, the procedure being to allow the print to lie in water till moist, and then squeeze the surfaces together. It is developed on this support by being treated with hot water and then alumed, being finally transferred to its permanent support and allowed to dry. This is known as the double transfer process, and an alternative method is to reverse the negative, in which case only one transfer is necessary, this being distinguished as single transfer. It may be remarked that the word insoluble is comparative. Only very hot water will dissolve out all the soluble compound, so that by employing water of various degrees of temperature we have a certain latitude of exposure. We can also have any surface according to the support which we use, a uniformity of colour which is not approached by any other process, and can rely on its permanency. One of the chief elements of success is in drying the paper after sensitising. It must dry regularly and not become dry and damp alternately, and time should be allowed for the image to adhere to its various supports. Attention should also be given to allow the final support to be quite limp before being squeezed on to picture.

In platinum printing, if plucky results are required, it is absolutely necessary to keep the paper dry. The oxalate bath gives excellent results when the paper is in good condition, but does not allow of much latitude in keeping. The D or developing salts of the company gives slightly pluckier results, the blacks being stronger, and the whole print a little colder. I prefer this bath to the oxalate. These baths are best used at a temperature of 60°, but can be used quite hot if warmer results are required.

A bath of oxalate, to which phosphate and sulphate of potash has been added, or the addition of phosphate to D salts, is said to give black-and-white results, and to be therefore useful for weak negatives. This addition is only effectual, however, when the paper is in very good condition. Printing dark and stopping development before quite complete will give a similar result.

The sepia paper is obtained by the addition of mercury to the platinum salt of the paper, and is developed in a warm bath, with the addition of a special solution of the company. The hotter the bath, the warmer the tone, and, if a still warmer tone is desired, it may be obtained by exposing the paper to damp before development. These papers are fixed in hydrochloric acid.

With regard to bromide work, little need be said. The exposure in enlargement is as the square of the diameter of the picture. A whole-plate enlargement requires four times the exposure of a quarter-plate from the same negative, with probably a slight increase owing to the increase in the breadth of the shadow—say five times in all for the average picture. An amidol developer will give a blue black, metol a slightly browner black, and hydroquinone may be used in combination with metol, giving more of a dead-black image than either. It is best, at least until experienced, to use the developer recommended by the makers of the paper. Plunge, without washing, into strong hypo, but finish fixing in a weaker solution. The same exposure-rule applies to negative enlarging, a good transparency being almost absolutely essential. This must be full of detail, and possess the quality known as soft (not out of focus).

In interior work, use the longest-focus lens which will give the result required. Keep the camera square and fairly low, use the cross front to obtain dissimilarity if necessary, and the exposure may be anything from two minutes with *f*-16 to five or six hours, the usual being ten or fifteen minutes with *f*-22 on an 80-speed plate. Use backed plates where there are strong lights, and the flash lamp when directly facing the windows.

With regard to the new papers, *velox*, *gravura*, &c., I find them admirably adapted for the purpose for which they are required. The metol developer gives in my hands the best results. Too much bromide should not be used—rather less, I find, than the makers recommend; and the developer should not be used weaker than is recommended, as the blacks tend to deterioration when so developed. Although any colour may be obtained by these papers, I cannot recommend their use for this purpose, carbon being by far the best colour process.

JOHN BANKS.

## BAS-RELIEFS BY A PHOTOGRAPHIC PROCESS.

[Revue Suisse.]

A NEW method of photo-sculpture—which must not, by the way, be confused with the relief photographs obtained by the compression of ordinary photographic prints against a matrix graven by hand—has been just introduced, under the name of *phototérisé*, by M. Lernaie in collaboration, on the practical side of the process, with M. Nadar père.

The medallions obtained are of all dimensions, from coins of the realm up to larger pieces, and in all grades of relief, from a few millimetres up to five or six centimetres, whilst the process is remarkable for its simplicity.

The model, who need not be powdered or painted, is placed in front of a dark background, so that the profile is presented to a photographic camera. Two negatives are taken, avoiding, for obvious reasons, all movement of the model during the short interval between the two exposures. The source of light for these two exposures should be as confined as possible—a magnesium flashlight—and is placed in a plane perpendicular to the axis of the lens, and slightly nearer to the latter than to the model. During one exposure the lighting is about three quarters to the rear of the subject; during the other, about three quarters towards the front. The two negatives are stripped and exactly superimposed one on the other. Their combination then represents in black the salient features of the subject which, in either one pose or the other, have received the maximum of light; the less prominent features, more feebly lighted, are represented in grey; whilst cavities in the face are reproduced as clear glass, owing to the special kind of lighting having kept them in shadow during each exposure. From the composite negative thus obtained a print is taken on any paper which lends itself easily to retouching, say, platinum paper.

On the image, which is visible at this stage, of which the whites correspond to the highest parts in relief of the subject, the operator proceeds to work in, with water colour or Chinese white, the tones which correspond to the degree of relief of the hair, the clothes, and other parts, which, by reason of their rather non-actinic colour, do not lend themselves readily to automatic reproduction in relief; it needs to be borne in mind that the exact reproduction of the relief of a head of hair would be hardly compatible with the usual conventions of sculpture.

At this stage also must be put in—in white or black according as they are to appear in relief or otherwise—the letters or ornaments which are to appear in the exergue. The profile of the medallion or coin is put in at the same time with Chinese ink.

This design in black and white is then reproduced in the form which it is destined eventually to take, and the new negative thus obtained will be used for making proofs in relief destined to serve as moulds. For feeble reliefs the printing is executed by well-known methods on a sheet of bichromated gelatine, but this would not be sufficient to give the relief of five centimetres and over demanded by large pieces of work. For such, a very thin film of gelatine is flowed on to a sheet of spongy material, swelling easily in water. The superficial gelatine film is sensitised with bichromate, and after drying exposed under the negative just described. It is then treated with water, which passing easily through those portions of the film protected from the action of light, and repelled, on the other hand, from those portions exposed, causes a swelling of the image corresponding to the relief of the original model. On to the block thus formed fine plaster is flowed and a plastic material pressed into the crevices, upon which retouching can be done. This last operation completes the relief in which the moulding of the points is executed. It may be added that the total time in retouching the intermediate black-and-white point and the relief in plastic material is about an hour for a medallion of large size.

L. P. CLERC.

## THE GREENWICH VISITATION.

ON Saturday last, June 3, the Board of Visitors visited Greenwich Observatory, for the reception of the Astronomer Royal's annual report. Lord Lister was unable to be present, but his place was taken by Professor G. H. Darwin (President of the Royal Astronomical Society), and among well-known faces were those of Sir G. Stokes, Sir R. Temple, Sir R. Ball, Professor Langley (U.S.A.), Professor Cornu (France), General Brackenbury, Captain Abney, Dr. Glaisher, Rear-Admiral Wharton, the Rev. Brooke Lambert, Sir W. Huggins, the Earl of Rosse, and many others.

The principal feature in the day's proceedings was the presentation to the Board of Visitors of the annual report of the Astronomer Royal. This year Mr. W. H. M. Christie had a good deal that was interesting to impart. He was naturally jubilant over the completion of the new Observatory building, which has been in progress since 1891, by the addition of the east and west wings. This handsome building provides much-needed accommodation for the Observatory staff. It has four wings of three stories, with a central tower carrying the Thompson equatorial and dome. Its completion makes it desirable that the boundary of the Observatory should be enlarged in order to show off the handsome new building. A proposal to give effect to this is under the consideration of the Admiralty, and there should, one would think, be no difficulty in the way. Among other additional buildings is the new magnetic pavilion, at a distance of about 350 yards from the Observatory, on the east side, which was completed at the end of September. The magnetic instruments for absolute determinations have been installed here. The greatest care has been taken to exclude all iron in building the pavilion, and the site has been selected so that there is no suspicion of magnetic disturbance from iron in the neighbourhood. The enclosure also provides a good meteorological station, where the standard thermometers and rain-gauges have been mounted.



During the year the sky has been closely scrutinised, the figures given by Mr. Christie being:—Transits, 11,764; determinations of collimation error, 298; determinations of level error, 694; circle observations, 10,830; determinations of nadir point, 665; reflex observations of stars, 560. The number of stars observed in 1898 was about 5000, and the meridian observations 1200 more than the average of the three preceding years.

As showing the progress made with the photo-mapping of the heavens, Mr. Christie gave a table which showed that, during the year ending May 10, 1027 successful fields were taken for the chart and 1030 for the catalogue, leaving 122 and 119 respectively to be taken of the 122 fields still to be photographed for the chart; 101 are within 7 degrees of the Pole, and this part of the sky was purposely left until near the epoch 1900.

During the same period photographs of the sun have been taken on 195 days, either with the Dallmeyer or Thompson photo-heliographs, and of these 394 have been selected for preservation, besides sixteen with double images of the sun. The chief incident in the history of the sun's surface during the period covered by the report was the very remarkable temporary revival of activity which set in at the end of July, and lasted almost to the middle of November, culminating in the appearance of the great group of spots of September 3 to 15. In the same connexion it may be mentioned that the number of hours of bright sunshine recorded during the twelve months was 1500, out of the 4454 during which the sun was above the horizon.

According to Mr. Christie, the mean temperature of the year 1898 was 51.3 degrees, being 1.8 degrees above the average for the fifty years, 1841-90. The highest daily temperature recorded in the shade was 92.1 degrees, on September 8, a rare occurrence for that month, only equalled once in fifty-seven years. On the other hand there were 158 rainy days, and the rainfall was 22.74 inches, being 1.80 inches less than the average of fifty years. The rainfall in September was the smallest, with one exception, since 1841.

#### AFFILIATION OF PHOTOGRAPHIC SOCIETIES.

At a meeting of delegates, held at 12, Hanover-square, W., on Friday, June 2, Mr. R. Child Bayley in the chair, a report made to the Council of the Royal Photographic Society by the sub-Committee on the relations between the Affiliation and the Society, and referred by the Council to this Committee, was considered, and with it a number of suggestions made by the various societies for the improvement of the scheme. In the discussion which ensued it was thought that the time had come when an improved system of conducting affairs might be initiated, the first step in which might be the appointment of a small executive Committee, to be intrusted with the work of carrying on the business of the Affiliation in the intervals between the general meetings of delegates. The following delegates were appointed the Executive Committee of ten members with the Hon. Secretary and Hon. Treasurer as *ex-officio* members of the same: Messrs. R. Beckett, H. W. Bennett, E. Dockree, S. H. Fry, J. A. Hodges, A. Mackie, J. C. S. Mummery, C. H. Oakden, J. A. Sinclair, and H. S. Ward, the Committee to have power to fill any vacancies. It was agreed to refer to the Committee the matter of the report from the Council of the Royal Photographic Society, together with the question of new lectures and slides for circulation, a number of topics for the former being suggested. It was decided to approach the Earl of Crawford with a view to inducing him to accept the office of Chairman of the Affiliation. A vote of thanks was passed to Mr. Child Bayley for his services as Chairman.

#### PALL MALL EXHIBITION, 1899.

The following is the result of the ballot for the Judges:—

Pictorial Section.	Technical and Scientific Section.
Harold Baker.	Capt. W. de W. Abney.
Colonel J. Gale.	Thomas Bolas.
A. Horsley Hinton.	Chapman Jones.
B. W. Leader, R.A.	
W. L. Wyllie, A.R.A.	

#### THE PRINCE OF WALES AND THE ROYAL INSTITUTION.

At the Centenary Dinner of the Royal Institution, which was held on Monday last, and which was attended by the principal English men of science of the day, the Prince of Wales made the following interesting observations:—

"Though it is nearly half a century ago, I have not forgotten as a boy the Duke of Coburg and myself being sent by our father to London, soon after Christmas, to attend those famous lectures which were then given by the great Professor, Michael Faraday. I have not forgotten the interest which we took in those lectures, and the clear way in which he

explained to the boys the difficult scientific problems, or the beautiful manner in which he showed us the chemical experiments which were then the order of the day. On an occasion of this kind it is very difficult to say anything new regarding an institution of this character, or to say anything that is not known by so distinguished and able an audience as is assembled here to-night; but, when one looks back, one thinks that 100 years ago this Society was just formed by Sir Benjamin Thompson, who was better known—and he himself would like to be better known—by the name of Count Rumford. And what is remarkable is that 100 years ago the same building, though it has perhaps changed in architecture, was purchased by Mr. Mellish, in which the work of the Institution is carried on and the lectures are given at the present day, in Albemarle-street. Of course, this Society has seen many vicissitudes, but fortunately there have been people to assist it in a pecuniary way, and only as recently as three years ago we were indebted to the liberality of Dr. Mond, who gave us, and endowed, the Faraday Laboratory, at the opening of which I myself had the pleasure of being present. When one looks back on all the eminent men who have worked and lectured at this Institution, one thinks first of the name of Thomas Young, and of the great Humphrey Davy—a man of whom all Englishmen are proud, and one of whose most remarkable discoveries, perhaps, was that wonderful lamp, which, philanthropically speaking, has saved the lives of thousands and thousands of miners. Then there is another name to which, in this connexion, I must again refer, that of Professor Michael Faraday, whom it was my privilege to know, and whom I shall ever associate in my mind with your Institution. I should also mention his distinguished successor, Professor Tyndall. At the present day there is a name that every one looks up to—a name remarkable as regards science in its every branch—that of Lord Rayleigh."

On Tuesday afternoon His Royal Highness took the chair on the occasion of the delivery of a commemoration lecture on "Thomas Young," by Lord Rayleigh, who, surrounded by all the apparatus essential to the delivery of an illustrated scientific discourse, explained at once how impossible it would be to deliver in the space of a single afternoon anything like a "commemoration" lecture in the sense of one recalling, even cursorily, the scientific achievements of the great men of science of the past century. No attempt would he make, therefore, to review the work of such men as Young and Davy, Faraday and Tyndall, Frankland and Gladstone; but, taking the discoveries made and developments introduced by Thomas Young as belonging to the scientific achievements of the early part of the century, he proposed presenting a brief retrospect of his researches. Having thus cleared the ground, the learned Professor, with the help of projection apparatus, exhibited some of the most striking of those experiments by which Young had demonstrated the results of his historic investigations. Foremost of these was the wave theory of light. As the great Newton had adopted the corpuscular, or emission, theory, Dr. Young's profoundly important doctrine encountered strenuous and even bitter opposition, especially from Lord Brougham. It was only after its independent discovery and enunciation by Fresnel that the soundness of Young's undulatory principle was admitted, as it now is universally. He was one of the first also to state in accurate language the true conception of energy as measured by the power of matter in motion to do work. The composition of colours, the tides, sound, and heat were among the subjects of his investigation, and he touched nothing that he did not adorn. "Perhaps," said Lord Rayleigh, towards the close of his discourse, "I have left you under the impression that Young knew everything;" and, lest his hearers should indeed carry away such an opinion, he hastened to recall, amid laughter, the brilliant savant's surprising declaration upon one occasion, that "there is no reason to imagine any immediate connexion between electricity and magnetism."

#### SOCIETY OF ARTS CONVERSAZIONE.

The Society's *Conversazione* will take place at the Natural History Museum, Cromwell-road, S.W. (by permission of the Trustees of the British Museum), on Tuesday evening, June 20, from 9 to 12 p.m.

The Reception will be held by Sir John Wolfe Barry, K.C.B., F.R.S., Chairman, and the other members of the Council, from 9 to 10 p.m.

The following portions of the Museum will be open: On the ground floor, the Central Hall, British Saloon, and Bird Gallery; on the first floor, the East and West Corridors.

A selection of music will be performed by the String Band of the Royal Artillery in the Central Hall, and by the Red Hungarian Band in the Bird Gallery, commencing at 9 o'clock.

Light refreshments (tea, coffee, ices, claret cup, &c.) will be supplied.

The entrance to the Museum is in the Cromwell-road. Carriages must enter the grounds by the east gate, and leave by the west gate. The cards must be given up on entering the Museum.

Visitors arriving or leaving by either of the Metropolitan railways will be allowed the use of the District Company's subway, which leads from the South Kensington Railway Station direct into the grounds of the Museum.

Further particulars as to the musical and other arrangements will be given in the programmes, which will be distributed on the evening.



## Our Editorial Table.

ADUROL-HAUFF.

Messrs. FOERST BROS., of 17, Philpot-lane, E.C., inform us that they are agents for this new developer, the principal features of which are as follows: It is the monochloride substitute of hydroquinone in the form of a white crystalline powder, easily soluble in water. The solutions keep for an extraordinarily long time, even in open bottles, and the used developing solution can be utilised again and again until entirely exhausted. It works more rapidly than hydroquinone, and is, even in winter, hardly influenced at all by the temperature. It is claimed to be an energetic, detail-giving, and clear working developer, without being rapid in the proper sense of the word. It gives much more density than hydroquinone, without any tendency to hardness, and is therefore advantageous for snap-shot and studio work and bromide paper. It does not require any clearing bath, and does not stain the fingers or attack the skin.

Mr. C. S. JONES, of High-street, Woodford Green, sends us some samples of what he terms "Photo Seals." These are embossed and coloured discs about three-quarters of an inch in diameter, and coated with an adhesive on the back. On the front tiny portraits of celebrities are printed, or any other photograph may be used. These "Photo Seals" are designed for use on note-paper, envelopes, postcards, visiting cards, wedding cards, invitations, menus, programmes. It is a pretty idea, which will doubtless, commend itself to many.

### THE "LITCHENSTEIN" BACKING.

Manufactured by Lichenstein & Co., Silvertown, E.

Messrs. LITCHENSTEIN, who are well known as manufacturers of caramel, &c., have sent us a sample of their caramel backing for photographic dry plates. It is put up in collapsible tubes, and has the consistency of a thick treacle substance. In this form it is easily applied to the back of the plate, and, as it dries very rapidly, it forms the *beau-idéal* of a backing mixture. Messrs. Lichenstein know perfectly well by experience what is required in a compound of this character, and their backing will be found a carefully prepared mixture, which thoroughly answers the test of practical trial.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, June 14, at eight o'clock. Members' Open Night.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, June 13, at 12, Hanover-square, at eight p.m. "Acetylene," by Professor Vivian B. Lewes.

THE publication in Great Britain of the *Art Amateur* will be resumed next month by Messrs Griffith, Farran, Browne, & Co., who intend to publish the English edition on the 15th of every month.

THE DERBY EXHIBITION.—The following are the awards in the competitive section of this Exhibition, which was opened on Tuesday evening last:—Silver medals: Messrs. H. Burkinshaw, F. C. Smithard, and C. J. Allen. Bronze medals: Mr. G. Walker. Mrs. F. H. Gandy, Miss E. Boden, and Mrs. Highton.

A STATUE to the eminent physicist, Helmholtz, was unveiled on Tuesday in front of the University, Berlin, in the presence of the Emperor and the Crown Prince. Helmholtz's statue is in close proximity to those of the two Humboldts. The occasion was made especially interesting as the first on which the Crown Prince has represented his father at a public function.

CITY AND GUILDS OF LONDON INSTITUTE.—The Exhibition of Practical Work executed by candidates at the Institute's Technological and Manual Training Examinations, 1899, to be held at the Imperial Institute (North Gallery), by permission of the Governing Body, will be opened to-day, Friday, June 9, at 3.30 o'clock precisely, by His Grace the Duke of Devonshire, K.G., Lord President of the Council.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On Saturday, June 17, there will be a photographic outing of the members to Westmoor Hall, Brimadon, at the kind invitation of Mr. A. L. Henderson. Will those members who wish to go communicate with the Hon. Secretary, 45, Torrington-avenue, N.W., who has the arrangements in hand? Great Eastern Railway, first train after two o'clock.

Messrs. W. W. ARTHUR, T. S. MUIR, & S. H. FULTON, of 36, West Nile-street, Glasgow, write: "Having acquired the old-established optical business of Messrs. Gardner & Co., it is our intention to add thereto a complete stock of photographic material. Our knowledge of the requirements in photography is a guarantee that nothing will be lacking to make this department a success. The stock will be replete with everything necessary for professional and amateur, and kept thoroughly up to date. Our optical department contains all the newest patterns of spectacles, eyeglasses, field and opera glasses, and general optical goods."

TRANSPARENT wire glass has recently been placed in the market for use in unprotected windows exposed to flames, where shutters are not desired. Wire glass has been recognised for several years as a valuable fire-resisting material, but solid cast glass having wire imbedded in it, which is also sufficiently transparent for use in windows, is believed to be a novelty. A firm in New York has recently succeeded in producing this material in sheets 18x40 inches in size and a quarter-inch and three-eighths of an inch thick. The glass is cast about a wire screen having an inch mesh, and is then polished on both sides to give it the necessary finish for use in windows.

A PARIS PICTURE SALE.—The four days' Valenciennes sale at the Petit Gallery in Paris was followed with much interest. The first day's sale, devoted to pictures and sculptures, realised 421,263fr. The portrait of Christopher Columbus, by Sebastien del Piombo, the only contemporary portrait of the great explorer, fetched 30,000fr. Two portraits of Talleyrand, by Prud'hon, were sold for 25,000fr. and 10,000fr. respectively. The sale included a series of royal portraits presented to Talleyrand by the different sovereigns whom he had served from time to time. One of these, Napoleon I., by Baron Gérard, fetched 16,500fr.; those of Louis XVIII., Charles X., and Frederick Augustus, King of Saxony, going for much less. Busts of Molière and La Fontaine, by Houdon, realised 48,000fr. and 30,000fr. respectively.

THE ST. HELEN'S EXPLOSION.—The inquest on the five victims of the explosion at the chlorate refinery in Karts' Works, one of the large concerns taken over a few years since by the United Alkali Company, was resumed at St. Helen's on Tuesday, May 30. It will be remembered that on May 12 a fire broke out in the crystallising room containing wooden tanks used for cooling chlorate. The flames ran from tank to tank, and quickly enveloped the whole building, the fire also spreading to the roof of a house where 160 tons of chlorate were stored. A little later the chlorate exploded with terrific force just as the workers were hurrying to places of safety, and reduced to ruins the extensive buildings of the firm. The vitriol chamber in the adjoining works was wrecked, a large number of dwellings in the surrounding district were devastated, and nearly all the large plate-glass windows of the town were shattered. Two men were killed on the spot, and twenty others were removed to hospital, three of the latter proving fatal. After all the evidence had been heard, Colonel Ford, Inspector of Explosives, and Mr. Richmond, Factory Inspector, expressed the opinion that chlorate should be stored some distance from manufacturing plant. The jury returned a verdict of "Accidental death," and suggested that buildings for chlorate plant should be fireproof, that the cooling tanks should be of iron instead of wood, and that chlorate should be stored in quantities limited by Government control.

"THE world was ever thus—I verily believe some of the pairs which wandered into the ark strayed there by mistake. Any way, some that have existence to-day 'never would be missed.' 'No, I am not thinking about the lively flea,' says a writer in a *Leamington* contemporary, 'but I wondered if the individuals who bother photographers had extraordinary jumping powers which enabled them to pop into all sorts and conditions of pictures. Take the photograph of the motor cars the other day. I am told a professional gentleman was commissioned to photograph the cars, the members, and the attendants. Would you believe it, there were several local fleas—I mean persons—in the picture. Of course, they popped in the Regent Hotel yard by mistake, and by mistake got in the range of focus just when the photographer deftly removed the cap from the lens, and by mistake they will wander past that photographer's window dozens of times to see if, by mistake, their images appear in the prints exhibited. Alas! by the process known as 'blocking out,' certain forms and objectionable features are obliterated even from photographs, and the picture, although causing additional labour through the springing capacity of the 'always-there' section of the community, appears as ordered, with cars, members, and attendants only. I remember, when the photographs were taken for the current edition of the *Royal Leamington Spa Pictorial*, that a whole host of youngsters got in the range of view when the Pump-room Grounds photograph was being taken, and I was much amused to see the way the children were handled by the photographer's assistant. It was thought desirable to have a few figures in the picture by way of relief, but the children directly the tripod was fixed flocked up in shoals. Having gauged the exact line of the picture, that assistant d-lighted dozens of little boys and girls by asking them to sit down upon the grass and to keep quiet. They were good children, they kept quiet, and by just about a yard saved the photographer the trouble of 'blocking' them out of the negative."

A CINEMATOGRAPH SCARE.—During a representation of the Passion Play at Oberammergau on the West-end Pier, Morecambe, on Sunday afternoon, which was illustrated with lantern and cinematograph views, a stampede took place amongst the audience, on account of the film of the cinematograph igniting. The area of the hall was packed, and, besides, there were a large number of people in the balcony. Everything went well for the first hour, but, when the cinematograph was about to produce the first series of views (the hall, of course, being in entire darkness), the film took fire and blazed up like an electric light. There was at once a wild rush of men and women in the darkness for the doors, and, although a few kept their heads and shouted, "Keep your seats! there is no danger," the panic was on, and confusion reigned until the greater part of the audience managed to make their exit. The orchestra, with great presence of mind, struck up a tune, but order was not restored until every door in the place had been thrown open and the electric lights turned on. The programme was proceeded with before a greatly diminished audience, but every time the cinematograph flared up there was a distinct feeling of nervousness. Fortunately, every one escaped with nothing worse than a severe crushing and a fright. Some zealous person broke the glass of a case outside the hall, where hose pipes are kept for emergencies, but the pipes were not needed. Mr. John Prior, Manager and Secretary of the Company, writes to say that the reports of the cinematograph accident at the performance on Sunday afternoon have been exaggerated. He states that there was only a slight interruption to the pro-



gramme, owing to one of the lantern regulators getting out of order. Immediately this happened the electric light was switched on and every exit door opened. The hall could have been cleared in two minutes, but the majority of the audience had no desire to leave their seats, and very few did so, most of whom immediately returned on the resumption of the performance. A the evening performance the hall was packed.

THE young British artist is a creature of queer moods and impulses. He is generally insufficiently trained. In the beginning he worships a laborious sort of drawing. Towards the end of this period he may be discovered wearing a terra-cotta or sage-green tie. It is a sign that he has discovered colour. The preliminary stages of this disease are painfully distressing to the observer. Occasionally they reveal a distinct phase of colour-blindness, writes Mr. Edward Hill in the *Sunday Sun*, varying in accordance with the prevailing fashion. Some years ago it was generally understood by the elect that all sunlight was "heliotrope." You had to shut your eyes two-thirds to get the effect. Then another school arose—I speak of the students, not of the masters—who invented iridescence, feebly following Monet. This, in the student, was distinctly humorous. Yet another generation specialised in slaty-blue. Once in a way you can veritably find something of this kind in nature—or at all events in Cornwall. Woe betide the youth who lets his senses be entangled in the meshes of "line." For him will Dürer have lived in vain, seeing that he has vended his soul to the curve of the Japanese colour print as interpreted by Beardsley and the "Dial." Long and sinuous will be his females, and the tulips of his wall-papers faint (as for lack of water) and inter-twinning. For him is there no salvation. He will become a designer of his fellows' book plates. Symbolism is another terrible happening to the young in art. It will afflict him at about the same time of life as that when the mere reader of books, becoming amorous, takes to writing verses. Providence, in its mercy, has arranged that the self-critical faculty shall be entirely absent from both classes in these days. It does this to afford comic relief to their elders, who are oppressed with the cares and sterner worries of daily life. I do not decry these young emotions. They are part of the process, and serve well to mark the miles along the road. I was reading some of my own verses the other night. They sent me very happily to bed. But imitation in art is a different matter altogether. It is inconceivable to me that critics can be found to praise some of the baser manifestations of it. That a living man, who has by stress of his soul and work of his hands acquired skill in handicraft, should deliberately set aside all his surroundings and try to project himself some centuries back into another life, is mere treason to his fellow-men. If he entirely succeeds, he may, guiltlessly or otherwise, commit forgery. There was the case of Bastianini. If he fails—as, being honest, he generally does—he rarely has the poor satisfaction of having added even to the world's amusements.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
10.....	Darwen .....	Excursion: Liverpool and New Brighton.
13.....	Birmingham Photo. Society ..	Flower Photography. H. T. Malby, F.R.P.S.
13.....	Hackney .....	Sale and Exchange Night.
13.....	Oldham .....	Excursion: Arley Hall. Leader, W. A. Nash.
13.....	Royal Photographic Society ..	Acetylene. Professor Vivian B. Lewes.
14.....	Photographic Club .....	Members' Open Night.
15.....	London and Provincial .....	Paper by Walter D. Welford.
17.....	Ashton-under-Lyne.....	Excursion: Reddish Vale. Leader, William Turner.
17.....	Birmingham Photo. Society ..	Excursion: Charleotte Hall, near Stratford-on-Avon. Leader, C. J. Fowler.
17.....	Borough Polytechnic.....	Excursion: Perivale and Twyford Abbey. Leader, P. C. Cornford.
17.....	Croydon Microscopical .....	Excursion: Godstone, Tandridge, and Oxted. Leader, Dr. Parsons.
17.....	Hackney .....	Excursion: Molesey. Leader, Major Woolmer-Williams.
17.....	London and Provincial .....	Excursion: Westmoor Hall, Brimsdown.
17.....	Oldham .....	Excursion: Oldham Municipal Jubilee.
18.....	South London .....	Leader, J. Fullalove.
		Sunday Excursion.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 1.—Mr. A. Mackie in the chair.

Mr. R. P. Drage passed round some old 12×10 wet-plate negatives, believed to be the work of Robert Kennett. The good quality of the photographs was the subject of remark, and a desire was expressed to see prints.

Mr. W. T. WILKINSON very much doubted whether the ordinary gelatin-chloride printing-out paper would do the negatives full credit. A natural tendency to brilliancy would be increased to hardness in the result, but it was pointed out, in reply to this, that the extreme depths of the shadows were really much more transparent than the same apparent depth of the present class of negative, and that they would print with more softness than an uninitiated person might imagine.

Mr. J. S. TEAPE passed round some negatives which were, he said, exposed alike for  $\frac{1}{2}$  second at  $f/22$ . They were developed with others, similarly exposed, in a sodinal solution (one in thirty) for three-quarters of an hour, at the end of which time some were positives and some negatives, the change to the positive state occurring in the ten minutes preceding their removal from the developer. This curious occurrence, it was pointed out, took place before fixing, and Mr. Teape had no reason to expect that any light had struck the plate in the interval, which was suggested as a likely cause for the reversal of

the image. The change from negative to positive was most pronounced and not of the more common, but partial, change.

Mr. J. E. HODD read a paper upon

### STEREOSCOPIC PHOTOGRAPHY [See p. 358].

the effect of which, he hoped, would be to expand the ranks of the recruits when he showed how little was the trouble and difficulty in this, one of the most fascinating of processes. Laid upon the table were a large number of stereoscopic prints from his own and his brother's negatives, with an example of the work of Mr. Victor Selb, of Antwerp. Incidentally, the lecturer stated that fourteen of the prints, equal to twenty-eight of quarter-plate size, were toned with no more than half a grain of gold, the paper being Special Sylvio, intended for sulphocyanide toning. The bath he used, however, was a phosphate bath, and certainly there was nothing lacking in the quality of the results. Mr. Hodd, continuing, said that he would be prepared to tone sixty quarter-plate prints with a grain of gold, choosing a particular brand of paper. Mr. Hodd subsequently demonstrated the trimming and mounting of the stereoscopic pairs of prints, using a revolving cutting table, by which the first of these operations was largely facilitated.

Mr. A. L. HENDERSON was sanguine enough to express the belief that the time would come when stereoscopic photography would supersede, or at least dominate, the commoner branch. As regards the question of keeping the component prints of a stereoscopic pair of an equal tint, he was inclined to the view that the effect would be better where one of the prints was lighter, so as to give the fullest detail in the shadows, the responsibility for depth of tone falling upon the second print, which might be more deeply printed. The effect might be secured in the printing operation, or by introducing a difference between the size of apertures of the lenses. There was another point which was worth mentioning. Taking a stereoscopic print, he showed that the distance from the margin to a certain spot varied as much as half an inch. How, then, he asked, could that half inch of view, which appeared in only one of the prints, be stereoscopically shown?

There ensued a conversational discussion upon these remarks and the pictures passed round, a cordial vote of thanks being passed to Mr. Hodd.

### PHOTOGRAPHIC CLUB.

MAY 31.—Mr. Lewis Medland in the chair.

Mr. J. R. GOTZ described a fluorescent screen for Röntgen-ray work, with the production of which he was intimately concerned. Originally made in Germany, fluorescent screens were now being turned out very successfully in England, and in the one under consideration he ventured to say that English makers had produced a better article than had previously been obtainable. Fluorescent screens, he proceeded to remark, find their chief use in the hands of the surgeons for diagnosis, examination of fractures, &c., and, like the discovery of the Röntgen rays—like Daguerre's discovery, and many others—they owed their being to a fluke or accident. Röntgen happened to have some platino-cyanide salt in close proximity to his apparatus, and noticed that it became excited under the influence of the rays. Barium platino-cyanide is the salt most used, but various other substances exhibit the same characteristics under the influence of the mysterious radiations to a greater or less degree, for example, the mineral williamite, a natural silicate of zinc, of which a lump and some powder were passed round. Nearly all bodies are subject to the penetrative powers of the Röntgen radiations, and, in fact, Italian scientists have found that the degree of penetration varies with the weight of the bodies themselves. Light bodies—wood, skin, flesh, and fibrous substances—offer little resistance, while bone and the metallic bodies offer an increasing amount of resistance. With these metallic bodies alone there is a wide difference in their degrees of resistance. Aluminium is very light (27), while lead is heavy (206). Water is nearly opaque to the radiation on account of its weight, while glass, which is also fairly heavy, is of a semi-opaque nature. Sodium (about 23), on the contrary, is still lighter, and offers less resistance. The salt used for the screens (barium platino-cyanide) is very sensitive, and is made by Johnson, Matthey, & Co., of Hatton Garden. Special precautions have to be taken in preparing the screens, the use of the hands being inadmissible on account of the delicacy of the materials. The salt is emulsified with a special collodion mixture, and is coated two or three times by hand upon a special heavy paper. Mr. Gotz had a excellent six-inch coil, made by Dean, of Hatton Garden, with which, and a vacuum tube, he showed to the members the whereabouts of their vital organs, bones, and other indispensable parts, much to the satisfaction of their owners.

## Patent News.

THE following applications for Patents were made between May 23 and May 27, 1899:—

BOX FOR CINEMATOGRAPH FILMS.—No. 10,742. "An Improved Receptacle or Box for Preserving Cinematograph Films." J. H. JACKSON and H. R. NATHAN.

PRINTING.—No. 10,733. "Improvements relating to Photographic Printing." Communicated by R. B. West. Complete specification. H. H. LAKE.

RÖNTGEN-RAY TUBES.—No. 10,877. "An Improved Method of, and Arrangement for, Protecting the Anticathode in Röntgen Tubes." C. H. F. MÜLLER.

SHUTTERS.—No. 10,933. "Improvements in Connexion with Photographic Roller-blind Shutters." J. E. THORNTON.

INTENSIFIER FOR SILVER PRINTS.—No. 11,025. "Improved Process for Intensifying Photographic Silver Prints." Communicated by the Actien-Gesellschaft für Anilin-Fabrikation, Germany. C. D. ABEL.



BACKGROUND STAND.—No. 11,043. "An Improved Photographic Background Stand." G. HOUGHTON and W. SALMON.

CINEMATOGRAPHS.—No. 11,059. "Improvements in Cinematographs." A. J. JONES and L. JONES & Co., Ltd.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### PHOTOGRAPHERS AND ASSISTANTS.

To the EDITORS.

GENTLEMEN,—We hear a great deal of the photographic assistant's hardships, but who is to blame in this matter? I have advertised five times in your paper, and had each time one or two replies, and on every occasion engaged a man, and sent word of same to others I have been in communication with, and after waiting about a week, in fact just about two days before the time they should drive up, I get a letter, saying they had engaged with another firm previous to my telegram, which I always send, with a letter following, and I always, when writing to assistants, enclose stamped addressed envelopes; what becomes of these I can't say, but I seldom get a reply, and I am not sure which costs the most, to advertise oneself or reply to advertisements of assistants.

Now, Sir, we hear a lot about the photographer keeping specimens such a long time. My opinion is that, if the assistants themselves were a little more businesslike, there would be less complaints from that quarter. My experience of the usual photographic assistants is, they are a lot of humbugs; they close with the first place they can get, at the same time they are striking a bargain with some other firm, and in the end they close perhaps for a little more money, and perhaps get thrown out soon after. I have actually known a man, applying to me, send another man's letter to me, pointing out what he had been offered. Of course, I have not engaged him. I suppose there will be plenty to reply to this, and then, Mr. Editor, I will let you know how I have been treated by photographic assistants. I am not at all surprised that girls are outdoing the men.

A photographer should decide quick, and an assistant should do the same, and if this was done always it would give the others a chance.—I am, yours, &c.,  
A PHOTOGRAPHER.

### A SOCIETY FOR PHOTOGRAPHIC PRINTERS.

To the EDITORS.

GENTLEMEN,—It appears Mr. Willatt is unable to appreciate the distinction between trade unionism and trade union policy. When he stated in his letter of May 15 that I viewed the matter in one way only, i.e., through already organized unions, he was making a statement against my idea of unionism; for, obviously, no one can advocate more than one policy or course of action. Hence it becomes very material to the point to know what I have written in 1895, 1896, 1897, &c. I have certainly in this discussion, quite consistently, advised a single policy, but that is no ground for justifying Mr. Willatt's sweeping assertion, unsupported by a fragment of evidence, in which he attempted to fix upon me his own individualistic and narrow interpretation of the functions of a trade union. I say again, I am not in favour of organizing photographic assistants in sections as a printers' union, operators', artists', or errand boys'. With such unions the cost of organization and high charge for working expenses would tell against them being really effective, and, although Mr. Willatt has uttered some magnificent, soul-stirring, high-sounding phrases, he has not noticed this and similar little matters of business. His main idea is to start something to improve and assist the photographic printers—a laudable enough ambition, yet scarcely a definite enough scheme to take into the market-place, workshop, or printing-room; moreover, it is evident he is unable to bring the aforesaid laudable ambition into the region of the normal intelligence. His "idea" is regulated by reason, argument, fact, evidence, little of which are discernible in his "plain and precise" statements.—I am, yours, &c.,  
JOHN A. RANDALL,  
June 3, 1899.

### PHOTOGRAPHS REGISTERED:—

O. E. Weale, 3, Victoria-road, Tamworth.—Photograph of Mayor and Corporation of Tamworth.

The Worthing Portrait Company, 4, Railway-approach, Worthing.—Photograph entitled "An anxious moment."

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

J. C. Abertillery).—It appears to be a matter for legal action.

ADDRESS WANTED.—Will Mr. Hector E. Murchison kindly send us his address?

AJAX.—The Hon. Secretary, 12, Hanover-square, W., will, doubtless, send you a ticket on request. You might mention that you ask at our suggestion.

STAINED PRINTS.—N. W. The red stains are clearly caused by the mounts. The chocolate enamelled surface is freely soluble in water, and the red in it stains the print when the wet starch comes in contact with it in the mounting.

HAND CAMERA.—INQUIRER. We do not know of any hand camera in the market for about four or five pounds that is fitted with an anastigmatic lens. The lens alone for a quarter-plate camera would be about the sum named without the camera.

OXALATE OF POTASH.—BRISTOL. Yes, you can make oxalate of potash by adding a solution of oxalic acid to one of carbonate of potash; but, unless your consumption is very large, you will find it more economical to purchase the salt ready-made.

MAKING GELATINE INSOLUBLE.—J. WILLIAMS. If chrome alum does not make the films as insoluble as you require, try formalin. It should be borne in mind that the full insolubilising action of the alums does not take place till the gelatine has been dried.

BROMIDES FOR PLATINOTYPES.—DOUBTFUL. If your townsman is supplying bromide prints as platinotypes, he is defrauding the public, and lays himself open to a prosecution, subjecting himself to heavy penalties. Any one can put the law in force against him who has been defrauded. You can, for example, if he supplies you with a bromide print when you have paid to have a platinotype.

LENS QUERY.—L. MUNROE writes: "If I mount the two lenses of an opera glass, with their convex sides outwards, in a tube with stops midway between them, can I use the combination as a photographic lens, and will it be rectilinear?"—Yes, rectilinear, if the stop be placed midway between the glasses. But the field will be very round, and only a small plate will be covered, even when a very small stop is employed.

VESSELS FOR HYPO FIXING SOLUTIONS.—HYPO asks: "Will zinc trays, such as are used in carbon printing, do for fixing silver prints and bromides? If not, would enamelled iron ones do better?"—Zinc will not do at all, as the metal would be acted upon by the hyposulphite of soda. Enamelled iron will do very well, provided the enamelled surface is perfect; but if not, and the iron is exposed, the silver prints would be stained by contact with it.

LANTERN LENSES.—G. LAME asks: "Would a whole-plate rapid rectilinear lens be suitable for use with a lantern? If so, what size condenser would be required, and what distance should the lens be from the condenser, focus of lens in camera, about eleven inches?"—The lens could be used, but the image would be very small unless the screen is placed a long distance away, and that will entail a great loss of light. If the slides used are of the ordinary size, a four-inch condenser will do. Its distance from the lens will have to be about double that from the lenses ordinarily used for the lantern.

COPYRIGHT.—W. E. B. writes as follows: "The publishers of a local newspaper have brought me a photograph of a group of royalty to copy, to be reproduced in their paper. The photograph was taken by —, and I expect it is copyright. Shall I, if I execute the order, run any risk if the picture is copyright, seeing that I am ordered by the proprietors of the paper to make the copy?"—Certainly, unless the proprietors of the paper have the sanction of the photographer to reproduce the picture. If you have any doubt about its being copyright, and there is little doubt that it is, you had better get an agreement from the proprietors of the paper to indemnify you in any costs you may be put to in case of an action, or, better still, not undertake the copying at all.

COLOUR SCREENS.—DIP THE DYER asks: "Could you give me the reason why the enclosed screens have dried in so unsatisfactory a manner? Gelatine used was Heinrich's. For the circular glass I boiled gelatine and dye together, and poured on hot, to dry slowly (acid green aniline dye). The square plates are lantern plates, fixed and washed, and, while wet, put in a solution of dye and water. These are brilliant green and acid green. I have tried dissolving dye in alcohol, but it's not a success. I may say, on several occasions I have made red, yellow, and blue screens without a flaw. Could you suggest the addition of any fluid to the gelatine and water? I have tried ammonia, with disastrous results."—Too much colour has been used, so that it has crystallised out of the film as it dried. The crystals can be rubbed off the surface, they are so thick.



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## EX CATHEDRA.

WE are informed that the next Traill Taylor Memorial Lecture will be delivered by Colonel J. Waterhouse, I.S.C., Honorary Secretary of the Royal Photographic Society. The subject will be, "Teachings of the Daguerreotype," in connexion with which Colonel Waterhouse has for some time past had a number of experiments in hand.

AN adaptation of a very useful device for taking enlarged images at one operation has been patented by an American optician named Nehring. He terms it an enlarging and copying lens. We learn that the lens has created "surprise" in photographic circles. It is meant to fit between the combinations of a double lens, and "when placed there the camera can be used to copy pictures, or photograph any object with enormous amplification." Thus, with hand and other cameras having comparatively small focal extension, it is possible with Mr. Nehring's attachment to obtain a portrait head or a portion of any other subject so large as to fill your plate with it. The idea, it may be pointed out, is not a new one. Amongst others,

the late Mr. J. Traill Taylor frequently commented on its practicability; indeed, at p. 89 of his book, *The Optics of Photography*, published in 1892, he describes and figures the idea under the heading of focus adjusters for lengthening the foci of lenses, by inserting such adjusters between the combinations of an existing lens.

\* \* \*

It is officially stated that after June 24, the Royal Photographic Society's address will be No. 66, Russell-square, Bloomsbury, W.C., where all communications, after that date, should be addressed. As previously announced, the President and Council will hold a reception of the members of the Society, and of the affiliated societies, at the new home, on Tuesday, June 27, at eight p.m.

\* \* \*

WRITING in our ALMANAC for 1898 on the subject of animated photography, we prophesied—in fact we believe that in this country we were the first to direct attention to the matter—a great future for what is now termed the parlour mutoscope. The form of instrument controlled by depositing the nimble penny in a slot has already delighted millions of people in London and the country, and it is now proposed by the companies exploiting the biograph and mutoscope patents to put parlour mutoscopes on the market, so that ere long these highly interesting developments of the principle underlying the old wheel of life or zoetrope may possibly be as common in the home as the stereoscope once was, and probably will be again.

\* \* \*

AGREEABLE dividends of twenty-five per cent. have recently been paid by the Mutoscope and Biograph Companies, and joy must naturally have taken possession of the hearts of the shareholders. The speakers at the various meetings appear to be confident that animated photography is not a passing fad, and that—of course, this is an inference that is read into the context of the quoted remarks—dividends of twenty-five per cent. will continue to be forthcoming. We do not think they will long be made out of public exhibitions of animated photographs. By-and-by it is safe to assume that animated photography will secure great patronage at the hands of large advertisers, and then farewell to it as an attraction at music halls and suchlike places. At any rate as a "draw" it may



be safely relied upon to have its day and no more. However, the possibilities of the mutoscope have yet hardly been touched at their fringe, and there is no doubt that an enormous amount of money is to be made out of popularising the idea. Of course, it is very largely due to American enterprise that animated photography and mutoscopy are so successful just now. Why do not some of our home manufacturers have a "cut in" at the latter branch, we wonder?

\* \* \*

NEW YORK is to be the scene next autumn of a great International Photographic Exposition. It will be held at the Madison-Square Garden during the week October 21 to October 28. It is stated that there will be exhibitors from France, Germany, Austria, and England, and a representative is said to have arrived here for the purpose of superintending the shipping of exhibits to New York. The scope of the Exhibition will be understood by an extract from one of our American contemporaries, which says that it will be made particularly interesting by the many demonstrations of processes of manufacture. The construction of cameras will be fully illustrated, and one concern will, in all probability, start with the rough wood, and show the whole construction of a popular make of camera from start to finish. A photographic paper house will demonstrate their products, and invite visitors to bring their own negatives for this purpose. The embossing and gilding of mounts, the grinding of lenses, testing of lenses, and the making of camera bellows will also be features. At least one photographer will have a studio with electrical installation in actual operation. Demonstrations of printing-out papers, platinum paper, carbon printing, shutter-speed testing, film-developing, and the like, a display of magazine cameras, a photo-engraver's exhibit, and the applications of photography to meteorology, astronomy, and the sciences are listed amongst the attractions.

\* \* \*

FURTHER, there will be a special loan collection of historical exhibits, and the steps by which the present-day simplified methods have been attained will be shown. A special department will be the optical and magic lantern section, in which acetylene, electric light, limelight, and oil lanterns will figure. The progress made in animated photography will be illustrated, and the advances in the application of the X rays will not be lost sight of. It is said that the Exhibition will be under the general management of Mr. Ernest R. Franks, who piloted successfully the great Cycle Shows of 1895, 1896, and 1897. The executive offices are 11, Howard-street, New York. We are indebted for the foregoing particulars, as we have said, to an American contemporary; no direct information has as yet reached us. The fact that an American representative has come, or is coming, to this country points to the supposition that considerable English support is anticipated. We are not sanguine that the English houses will take a very enthusiastic view of the matter, particularly as the Paris Exposition is so near, and the advantages likely to accrue to English exhibitors at an American Exposition are not easy to perceive.

\* \* \*

THE dearth of interest in British photographic societies and kindred institutions and the failure which is only too frequently their fate is a theme which, for years, has excited comment in these pages. But, if we go farther afield, we see that much the

same state of things is prevailing. We find an Australasian contemporary drawing a very gloomy picture of the condition of photographic institutions in Sydney, New South Wales. It tells us that a long-felt want is discovered, or said to be, quite the correct steps are taken to fill it, a wild burst of jubilation fills the air, and some of it gets into little out-of-the-way paragraphs in the local press. "A few youths who fondly believe, and try to hope they can run the whole show, stagger along under a temporary deluge of fame derivable from mutual back-scratching, lose their heads in a sense of their own self-importance, disgust the solid element of the partnership by their overweening conceit, and anger, hatred, envy, malice, and all uncharitableness take the place of those flatterer professions of desire to "further the interests of photography," which were declared to be the foundation-stone of the structure. Then a sale, an empty room, and a more or less prolonged interval of rest until somebody else arises with a mission to "try it again." There is no exaggeration about this. The picture is a familiar one in all parts of the Australian continent where photographers most do congregate."

\* \* \*

ADDRESSING itself to details, our contemporary adds that the Photographic Society of N.S.W. has sold off its property and given up its rooms, and its present address is a steam launch lent by one of its members, which leaves Circular Quay at irregular weekly or fortnightly intervals to follow a yacht race. The Austral Camera Club is a private one, and therefore exempt from comment. The Railway and Tramway Camera Club, the Lands Office Society, &c., are purely departmental, and there are hundreds of earnest and enthusiastic photographers, both professional and amateur, residing in and within a few miles of Sydney, who are perforce compelled to go "on their own," for the simple reason that there is no club to which they can gain admission. The people who are directly responsible for having "messed up" photographic society work in Sydney take refuge behind the statement that "members would not pay up." The members referred to say that no value was offered in return for the money, and there was no visible advantage to be derived from belonging to a club which had no advantages to offer. This is indeed a melancholy condition of affairs for such an important centre and town as Sydney, N.S.W. Here at home desolation does not go so far as this; but the continued failure of societies designed to benefit professional photographers suggests the reflection that, as a class, they are long past helping.

\* \* \*

MESSRS. L. GAUMONT & CIE. of 25, Cecil-court, Charing Cross-road, London, W.C., inform us that they have accepted the agency of Messrs. Lumière & Fils of Lyons, for Great Britain, India, and the Colonies; and that they have become their sole representatives in those countries. They have now a stock at the above address of Messrs. Lumière's chief products and manufactures, briefly surmised as follows: Orthochromatic, panchromatic, and ordinary dry plates; rigid vitreous films, orthochromatic, panchromatic, and ordinary; chemical products, including developers, the Lumière cinematograph machine and collection of over a thousand films. With reference to the foregoing, Messrs. Fuerst Bros. ask us to note that they will supply the goods of Messrs. Lumière to their customers and to the trade in the future, the same as they have done during the past five years.



## THE COPYRIGHT UNION AND THE PROPOSED COPYRIGHT BILL.

DURING the last two months we have made several references to the Copyright Bill, now before the House of Lords, in so far as it proposes to amend the existing law of copyright as it relates to photographs. In our issue of May 5 we gave an article which elucidated the principal points of difference between the old Act and the Bill under consideration. On May 26 we published the essential parts of the Bill, so that our readers have had brought to their notice the whole of the provisions which it is sought to substitute for those that have governed the law of photographic copyright since the year 1862.

It has been doubtful up to the present whether any action would be taken to protect the rights of photographers in copyright as they might be affected by the contemplated measure. The Royal Photographic Society appointed a Committee to consider the Bill, but, up to the present, nothing has come of that action. It is an open secret that the promoters of the Bill, chiefly members of the Royal Academy, were disinclined to listen to the views of representative photographers on those parts of the Bill by which their interests were concerned, and thus no opportunity was available for amending the measure before its presentation to the House of Lords. It certainly must appear to the lay mind a very strange thing that a proposed piece of legislation vitally affecting the legal rights of such a numerous and growingly important class as photographers should not be drawn up in consultation with those best qualified to judge how far the reasonable requirements of that class are likely to be met.

Fortunately a Select Committee of the House of Lords has the Bill under consideration and is taking evidence upon it. The Photographic Copyright Union has applied to be heard before the Committee, and witnesses will be called to give evidence on certain points of importance. Opinion, so far as it has been expressed by photographers on the provisions of the proposed measure, is favourable to the Bill, because at the first glance it does not vitally interfere with the copyright now enjoyed by photographs under the Act of 1862 (an Act which, from the photographic point of view, has been found to work extremely well), but the legal advisers of the Copyright Union have indicated certain clauses, which, if passed, will press unfairly on photographers; while, in at least one case, a state of things will be created which will entirely upset the present harmonious working of a most important branch of copyright practice.

It may be well if we briefly indicate those parts of the Bill to which the Union takes exception. It is proposed to reduce the existing term of copyright from forty-two years, or seven years after death, to thirty years. On what ground this alteration is to be made is not clear. Copyright in photographs is to-day surely not less valuable than it was thirty-seven years ago; on the contrary, it is easy to argue, and just as easy to prove, we imagine, that it has increased rather than decreased in value. The wide-spread employment of photography in all the arts and sciences, its growth as a reproduction process, its increasing uses for the portraiture of distinguished people, as a method of recording vanishing buildings of historical interest, scenes of national interest—indeed, its constantly augmenting utility in all the affairs of daily life supply an overwhelmingly powerful plea in favour of placing photography on the same footing as fine art. It will be a grave injustice if the term is

reduced, and we hope the Copyright Union's witnesses will be emphatic in their protests against any alteration.

An equal degree of perplexity asserts itself when we come to inquire why, after a lapse of thirty-seven years, the Legislature is to be asked to throw over the classification adopted in the Act of 1862, and draw a sharp distinction between works of fine art and photographs? The distinction, *per se*, would not matter in the least if it were not made the occasion of an attempt to whittle away the photographer's enjoyment of copyright. It is not opening up an argument over the right of photography to rank as a fine art in pointing out that, if it were worthy of so being classified, for legal purposes, thirty-seven years ago, the lapse of time has hardly operated to deprive it of that right. On the contrary, it is but a commonplace to assert that the very large strides made by photography as a means of pictorial expression since the existing Act was passed strongly confirm and emphasise rather than depreciate its claim to recognition as a fine art, for purposes of legislation. It will be the object of the Copyright Union to remove the distinction it is sought to draw in the proposed Bill, and if success in that object is achieved a great gain will result, for, in matters of copyright, photography will enjoy all the rights conferred on the recognised fine arts.

Perhaps the most important and far-reaching clause in the Bill is that which deals with the relations of sitters and photographers. At present, where a sitting is not paid for and "consideration" is given, the copyright in the photograph so obtained vests in the photographer, who is free to do as he pleases with it and to impose his own terms for the right of reproduction. A clause dealing with copyright in portraits which we here quote would completely revolutionise this state of things.

The clause runs: "In case any work the subject of copyright under this Act shall be a portrait made on the request of any person for valuable consideration, though the copyright remain in the author or his assigns, no person, whether the author or his assigns or not, shall be entitled to make a copy of such work, or to sell, distribute, let for hire, or exhibit such work or any copy thereof without the consent in writing of the owner of such portrait for the time being. Such owner shall have all the rights of an owner of copyright under this Act to prevent infringements of this section, and to obtain the seizure of copies dealt with in breach of this section, except that it shall not be necessary, in order to enforce such rights, for him or for the portrait in question to be registered under this Act. For the purposes of this section any work shall be considered a portrait whose principal object is the representation in any form of art of any person."

So that, if we understand this somewhat involved clause aright, the photographer may take the portrait of a celebrity without receiving payment and yet be unable to exercise the right of publication in any shape or form without written permission. The latter condition would introduce a very disturbing element in every photographic business; and indeed it is doubtful if it would be found workable. One thing is clear, that the Bill proposes to substitute for the present satisfactory relations between photographers and sitters who are photographed without payment a set of conditions which would very seriously hamper publication photography, a constantly growing branch, and render difficult if not impossible the relation between photographer and sitter on the one hand and between photographer and publisher on the other. As it was



put to us by a well-known authority on the subject, the clause we have quoted would kill the publication trade.

The crowning absurdity of the Bill is that which invests a common informer with the right, to be granted by a magistrate, of taking a policeman to search anybody's premises suspected of containing photographs contravening the provisions of this Bill. A or B has only to suspect that you possess some photographs which are somebody else's copyright, and your house can be invaded as if you were a malefactor. This and other clauses we have referred to reflect no credit on the common sense or intelligence of the draughtsmen of the Bill, and which we hope will be purged of them in its passage through Parliament.

**Photography a test for Reagents.**—Messrs. Lumière Bros.' process of development with acetone, &c., has been put to a novel use by them in a mode of detecting the presence of these bodies by their photographic behaviour. To apply the test, 25 c. c. of an aqueous or alcoholic solution of the substance under examination is mixed with double the quantity of solution containing seven per cent. sulphite of soda, and one and a half per cent. of pyro or a similar hydroquinone solution, and applied to a plate acted upon by light. A similar test solution is diluted with an equal bulk of water, and applied also to an exposed plate, and the two plates are compared. The method is so sensitive, that it will detect formaldehyde (formalin) diluted 25,000 times, acetaldehyde 15,000, and acetone 2500 times.

**Measuring Volumes.**—The use of flasks for measuring liquids would, we think, be much more common if their innate usefulness were more known. The "graduated measure," or, as the Americans term it, the graduate, is the usual agent employed by the photographer; but it has many disadvantages. Where very close accuracy is not needed, a most excellent substitute for them is found in an ordinary glass bottle, preferably one with a wide mouth. We know one well-known photographer who has for all ordinary purposes abandoned graduates in favour of bottles for measuring the ingredients of batches of developing solution. He keeps a set of bottles of one, two, and four-ounce capacity at hand, using one or the other as needed, and he prefers them to the ordinary glass measures. When mixing larger quantities of liquids, or when making standard solutions for stock, measuring flasks may be obtained which indicate with great exactitude. In measuring, for example, the acids in making pyroxyline, open measuring glasses, even those of cylindrical form, are entirely inadequate, and flasks should be employed, as upon the precision of quantities employed depends entirely the quality of the product and its uniformity; indeed, it may be questioned whether the method of weighing is not still better, but certainly no graduates should be used. The requisite quantity of water should be either taken up by a pipette or measured from a burette; but those who have personally taken up pyroxyline-making can understand the absolute accuracy needed to ensure uniform results. A difference of ten grains of water in two pints of acid would make a difference of two or three per cent. in the weight of the gun-cotton produced, and, as is well known, the best test of uniformity of product from a given formula is to be found in the amount of increase of weight the cotton-wool takes on by the treatment with the mixed acids.

**A New Lithographic Process.**—The "Wharf Litho" is the name given to a new method of lithography recently described in the *Times*, and which possesses features of so entirely novel a character that it will be well to draw attention to them on the possibility of the principle being adaptable to photographic purposes. The broad principle of lithography is the production of a picture in pigment held in a greasy medium upon a partially porous surface. To print from it, the first operation is to pass a moist sponge over all; this wets the parts of the stone uncovered by the picture. An

inked roller is then passed over the stone; the wetted surface repels the ink, but the greasy picture takes it up. If now a piece of paper be laid upon the inked stone and the whole passed through a press, a print is the result. This is a rough outline of a process which has many little details of manipulation. In the Wharf Litho process all wetting is done away with, and the stone is replaced by zinc, prepared in such a way, by means of chemical action not yet made public, that the non-picture portion is self-repellent of the ink. The practical result is that printing can be carried on quicker through absence of periodical delays to work up the image, &c., and the press can be run at a much quicker rate. It is, of course, impossible to make any suggestion as to photographic use till the patent specification is published; but, seeing the process is of a chemical nature, it is permissible to hope that photography may be able to utilise it.

**Preparation of Pure Silver.**—Herr Otto Pfeiffer, in the *Chemiker Zeitung*, describes a method of treating residues so as to obtain pure silver for dissolving and making nitrate. He dissolves residues in strong ammonia, distils off the surplus ammonia, and precipitates the chloride with pure hydrochloric acid. The washed chloride is then placed in a porous cell with dilute sulphuric acid, the cell being also surrounded with similar weak acid. In the porous cell is placed a piece of platinum foil, which, by means of a platinum wire, is connected with an amalgamated zinc plate immersed in the outer acid. The apparatus is left for a day or two, and the reduced silver well washed with water.

#### ON THINGS IN GENERAL.

I HAVE read that surprise is felt that the recent great advance in X-rays technica, the Wehnelt interrupter, has been so little noticed, considering the important alteration in methods and the vast improvement in results that follow its adoption. That these changes are improvements, vast improvements, is true beyond the shadow of a doubt. An explanation for this supineness has been offered in the need that exists for a high voltage to bring out the efficiency of the new contact-breaker, and, seeing that 50 or 100 volts is desirable with even a comparatively small coil, there is something to be said for such ground being taken. But this is not all; it is indeed very possibly only a minor operating factor. It is in all probability that the true cause of the indifference manifested is the fact that manufacturers of coils have no interest in seeing the successful introduction of the Wehnelt apparatus, for it is so simple that one could be extemporised in a very short time with a glass tumbler and a sheet of lead as the principal parts of the new arrangement, its use requires a coil of quite simple construction in comparison with those now made. No condenser, no expensive spring or mercury break of the old type, and the production by the simplified arrangement of a spark twice or three times as long as with a similar-sized coil made with the older essentials. *Verbum sap.*

When I read all the details of the new Copyright Act, I feel inclined to exclaim *parturient montes*, &c. What have we gained, except an emphatic distinction between works of fine art and photographs (the latter being classed with "casts from nature"), a reduction of the time of continuance of copyright, and a very emphatic difference between the results of the brainwork of the photographer and of the painter. When the latter is commissioned to make a portrait and makes it, the copyright belongs to him; but, when a photographer is commissioned to make a portrait and is paid therefor, the copyright does not belong to him. His work is classed with the boarding-school Miss's clay cast of a fern leaf; indeed, if the latter did a fern leaf in poker-work, I am inclined to think she would have the "pull" over the photographer as regards copyright. Perhaps I have not read the Bill aright. I hope not, for the credit of those praiseworthy gentlemen who have taken such pains over photographic interests in the matter.

The Rev. F. C. Lambert, whose knowledge of optics is well known, has been giving an explanation of the well-worn problem why we



do not see objects the wrong way up. He speaks of the retinal image "which we, by an unconscious mental action, reinvert." Philosophers without end have attacked this problem, always with unsatisfactory results to their disciples, and, though the reverend scientist has followed in their footsteps, it will not be difficult to show where they have all gone astray. They have gone to optics and psychology when it was English grammar they should have called into requisition. It is, without doubt, purely a question of etymology, of the meaning of words. When we speak of an object being visibly "inverted" and "reverted," we must have a standard of comparison, and that standard a visible standard. Now, where is that standard to be found? Let us take Macaulay's New Zealander, standing on London Bridge. We tell him he sees the bridge upside down really, but he makes it all right in his head. This would be so much nonsense to him. If, standing there, the then visible sky was at his feet, and the bridge over his head, he could understand the matter; but nothing whatever is "inverted or reverted." He has only one standard, we all have only one standard, and the eyes act up to it. It would be every bit as reasonable to say that "the blood relations of Macaulay's friend, who, in a small part of their land, are immediately under our feet, have attained a habit of re-inverting the objects they see, because really they are standing on their heads and don't know it; they have, in fact, become used to the thing from their birth, and so don't notice their absurd position; and, indeed, were it not for the fortunate existence of the laws of gravity, they would drop off into the sky."

At a discussion on developers the other day at the London and Provincial Photographic Association, a member said of sulphite of soda solution that, after being kept some time, it failed to give the same blackness of the image, although the solution had undergone no change in appearance. It would be very difficult to imagine what change in appearance it could be expected to undergo; but, unless it were kept in an hermetically sealed vessel, it certainly would be likely to change in constitution, though not in appearance. It might be expected to gradually absorb air and become converted into sulphate, after which the explanation of its ceasing to give the same blackness is self-evident.

There is generally food for thought and plenty of valuable information to be gleaned from a perusal of the reports of the meetings of the above-named Society. Take, for example, the Mr. Beckett's revolutionary dictum that Judges should give reasons for their decisions, and that in this way an incalculable amount of help was to be given. Now, he was perfectly right; an immense amount of good might be done, and the ambitious student learn a great deal, but there is a deal of human nature in human nature, and I don't think Judges generally in practice will depart from the advice of the old Judge to the young one: "Never give reasons for your decision."

Some one asked the other day how to retain the gloss on enamelled prints when mounting them, and the reply was to paste two or three thicknesses of paper on the prints while they were squeegeed upon the glass. A still better plan is to use one thickness of waterproof paper in a similar manner. Such paper, made for the purpose, is now regularly obtainable from the dealers in materials.

On the subject of tips, another may be given. Reference was recently made in the JOURNAL (LANTERN SUPPLEMENT) to cleaning out the nipple of an oxyhydrogen jet when it had become roughened by use. An excellent extemporised file for this purpose may be made by taking a fine knitting needle and rubbing it with a piece of emery cloth of medium grain tightly held between finger and thumb. A splendid file is so produced, which answers the purpose admirably.

The letter on "Photographers' Assistants" in last week's JOURNAL emphasises in the extreme my remarks showing that there were two sides to every question, and so, in consequence, with that touching the grievances of these long-suffering men. As I before said, they are subjected at times to what is neither more nor less than cold-blooded cruelty in the retaining of their specimens. But it is well known to all employers that, in many cases, such retention is mainly owing to their own gross carelessness and want of thought in the way they dispatch their specimens, badly packed, and without the slightest indication upon them as to where or whom they come from.

A man wants the patience of Job to sort them and return them all to their legitimate owners.

I hope Mr. Everitt will not think me discourteous in being so long in replying to his note putting certain queries to me. It escaped my attention till so long after, that I thought it would be better to include it in my usual periodical lucubration. To query the first, I should say, I should find it very difficult indeed to show that a point moving half an inch in  $\frac{1}{500}$  or  $\frac{1}{5000}$  of a second would not be represented by a line, whether straight or curvilinear. As to his second query, I should not attempt to show that every part of a horse in gallop moves at uniform velocity, for they do not. Possibly the fetlock might be looked upon as the portion whose progressive motion at times was the slowest; but, then, we look at the fetlock of a cart horse rather than a race horse for a manifestation of hair.

FREE LANCE.

### "KACHIN"—ANOTHER NEW DEVELOPER.

STILL they come, the new developers. The latest addition to the list is "kachin." It is, I believe, not yet on the market, but I have been favoured with a sample, with which I have experimented somewhat largely, in comparing it with other developers, old and new, and the result, I think, may be of interest alike to professional and amateur readers of the JOURNAL. I may at once say, as an old photographer, that my pet developer has hitherto been the "good old pyro," which, perhaps, is still more largely used by professionals, and some amateurs, than all the other developers put together, at least in this country. It must, however, be confessed that our old friend is not all that could be desired. For example, it cannot be used, when mixed with the accelerator, for more than one plate without risk of staining the film; also, in a prolonged and forced development, the film is in danger of being stained, unless the solution is changed from time to time. Another serious objection to pyro with many is that it stains the fingers and nails badly, and the stains are difficult of removal. This drawback is not a very serious one with professionals, who, as a rule, are not over-squeamish as to the appearance of stained fingers. The case, however, is different with amateurs.

The newer developers, the majority of them, are free from the above inconveniences, but, unfortunately, they are, for the most part, accompanied by others from which pyro is free. For instance, metol is free from finger and nail-staining, but with many persons it has a very pernicious action on the skin. Amidol, again, though free from this latter evil, stains the nails, and it does not keep well, as the crystals become discoloured. Eikonogen, like metol, is difficult of solution. Hydroquinone and glycin are slow in action, and the other newer developers have their drawbacks, more or less.

What seems to be required, to be the perfection of a developer, is one that embraces all the best qualities of the others, while it is free from their undesirable ones. So far as my experience has gone, kachin more nearly approaches that ideal than any other with which I am acquainted. Of its chemical composition I can say nothing. All I can say is, that it is in fine crystals that do not seem to deteriorate, even when freely exposed to the air. It dissolves directly it is put into water, almost as quickly as pyro does. I believe I am correct in saying that, like all the new developers, and our pyro now, it is "made in Germany."

Here are formulæ for the developer:—

#### A SINGLE-SOLUTION DEVELOPER.

Water .....	200 grammes.
Sulphite of soda .....	5 "
Carbonate of soda (crystals) .....	10 "
Kachin .....	2 "

#### A TWO-SOLUTION DEVELOPER.

##### SOLUTION A.

Water .....	250 grammes.
Sulphite of soda .....	25 "
Kachin .....	5 "



## SOLUTION B.

Water .....	250 grammes.
Caustic soda (pure sticks) .....	5 "
Phosphate of soda .....	47 "

For use mix one part of A with one part of B and one part of water.

In making the B solution I find it better to dissolve the caustic soda first and add the phosphate afterwards, it then dissolves more quickly than when the two salts are put into the water together. It is the two-solution developer that will be found the best for general use, as it is more energetic in action than the other, a plate with a correct exposure being fully developed in from two to three minutes. With the single-solution developer the time is longer, and, in my hands, it does not yield so much detail in the case of under-exposed plates as the other, even with a prolonged development. It is, however, for that reason better adapted for plates which are known to be over-exposed, particularly when it is restrained with a bromide, the effect of which with kachin I shall say more about presently. The single-solution developer, when diluted with an equal bulk of water, makes an excellent developer for bromide papers. The negatives developed with kachin do not reduce in the fixing bath, like those by some other developers, therefore they should not be made denser than they appear in the solution. The finished negatives are particularly clean and clear in the shadows, though full of detail, while the lights are a fine black, with good printing quality. The negatives, being of a vigorous character, are as well suited for platinotype and carbon printing as they are for the P.O.P.'s.

It may be well to refer to a few of the comparative experiments I have made with kachin and other developing agents. These experiments, it may be mentioned, were all made on half-plate or the  $7\frac{1}{2} \times 5$  size, exposed in a bi-lens camera with accurately paired lenses of about six inches focus used with their smallest stops. After exposure the plates were cut in half, thus giving two plates absolutely identical as regards subject and exposure. Compared with pyro ammonia and pyro soda the results with kachin were much the same as regards detail, but those with the latter developed more quickly and were free from the yellow tint of most pyro-developed negatives. With metol the image appeared rather quicker than it did with kachin, but before sufficient density was obtained the latter had overtaken it, and that negative in the end was finished before the metol one. In the fixing the metol one lost in density, while the other did not. Tried against hydroquinone, it gave more detail in the deepest shadows, and the negative was developed and fixed by the time the hydroquinone one was fully developed. Tried with amidol, the kachin had the advantage, so it had in a less degree in the case of metol-hydroquinone, alike in detail and in density, both with correct exposures and under-timed ones.

A very great advantage in kachin, particularly to amateurs, is that the mixed solutions can be used over and over again — not necessarily the same day — and, until many plates have been developed in it, there is no appreciable loss of energy. The mixed developer may be kept for days, even after many plates have been developed in it, and it will still work well, though it will require a little longer time. Some solution, in which several negatives had been developed, was left standing in a beaker simply covered with a glass plate for five days. It had then become of a faint pinkish straw colour, but it developed well, and was but little slower than at first; also, the negatives were perfectly free from stain. I have a large bottle, into which the kachin solutions after use have from time to time been put. Some of it must be three weeks old, and taken part in the development of dozens of negatives. On trial to-day it worked all right, though, as might be expected, it was slower in action than that newly mixed; but the negatives were perfectly free from stain or veiling.

Reference was made just now to the effect of bromide with kachin. With normal exposures no bromide is required. In the case of over-exposures, however, it is a great power at command, and a little goes a long way. A few drops of a ten per cent. solution of bromide of potassium to the ounce of developer has a great restraining power, and a considerably over-exposed plate may, by its

addition, be made as good a negative as if it had been correctly timed. Indeed, with an excess of bromide, a much over-exposed negative may be made to look like an under-exposed one. As an experiment a plate was given perhaps twenty times the correct time. One half was developed with the normal solution, and, as might have been expected, the image flashed out at once, and, except the deeper shadows, was quickly buried. For the other half the developer was restrained with about six grains of bromide to the ounce of solution. This negative was a good printing one, and did not appear to be very greatly over-exposed.

Although I have developed many dozen plates with kachin during the past three weeks, there are no stains on, or other inconvenience to, either the skin or nails of the fingers. This fact, coupled with other advantages accredited to this new and latest developer, will, no doubt, be highly appreciated by amateurs.

There is one curious, and at times valuable, property in connexion with kachin that I had almost forgotten to mention. Wishing to test it under all conditions, I tried it with some stale plates, some years old, of different brands against other developers, pyro, metol, and hydroquinone. With all the latter the negatives showed the well-known characteristics of stale plates in a marked degree, but the halves developed with kachin were much the best; with one brand, almost free from any stain whatever. In all cases usable negatives were obtained, whereas with the other developers the negatives were mostly unprintable. Of course, no one knowingly uses stale plates, but sometimes, when the stock runs out and more have to be purchased, *en route*, at out-of-the-way-places, where the sale is small, one occasionally gets "landed" with some. In such cases I would say, Use kachin for their development.

E. W. FOXLEE.

## THE DERBY EXHIBITION.

THE Exhibition of Photographs which was opened at Derby on Tuesday evening, the 6th instant, is an interesting proof of the influence of one man. Whenever a photographer hears or sees the word Derby, he immediately connects it with the name of the late Richard Keene. It is safe to say that, but for the example he set, and but for the work he did, the collection of photographs which the Derby people can now enjoy would not have been shown. Mr. Keene set up for himself a high ideal, and was not content till he reached it. Captain Abney, the President of the Derby Photographic Society (who was, if we mistake not, an early pupil of Mr. Keene's), followed his master's example, and was not content with anything less than the highest class of work; and, judging from the exhibits of the local Society which form part of the collection now on view, each member of the Society seems to be striving after the topmost place; the result is an exhibition of photographs equal, if not superior, to any which has yet been held. It is admitted that the people in the Midlands have a more highly developed artistic feeling than the inhabitants of any other part of England, if we except London. It is not to be wondered at, therefore, that when Birmingham folk and Derby folk take up photography they give us something more than the usual thing; they seem to know, instinctively, what will make a photographic picture, and what to leave alone.

With the assistance of the Corporation of Derby, which has placed the convenient, admirably lighted Art Gallery at the disposal of the Derby Photographic Society, Mr. Crowther, the curator of the Art Gallery, and Mr. Victor Haslam, the Secretary of the Society, have got together a collection of photographs which far surpasses any of the triennial exhibitions which have hitherto been held at Derby. With the greater part of the Invitation Section our readers are already acquainted; but, if possible, they should take the opportunity of renewing the acquaintance. It is not every day they have the chance of seeing W. Crookes' *Old Lady*, nor his *Sheriff Comrie Thomson*, or Harold Baker's *Countess of Warwick*, his *Pleasant Story*, or his *Portrait in Costume*. Here, too, are some of Craig Annan's best works, and H. H. Cameron's ever-lovely *Miss Bagge*, which Mr. Cameron himself cannot hope ever to excel. There is, to us, a new portrait by W. J. Byrne, No. 113, a large head, untouched, taken direct, of fine quality and grand simplicity. There is also work by Smedley Aston, Percy Lewis, A. H. Hinton, O. G. Rejlander, Karl Greger, J. Gale, Dr. Morgan, Paul Martin, A. Keighley, whose No. 54, *A Ryt in the Clouds*, is better even than his older *Gather the Roses*. F. H. Evans sends his wonderful *Sea, and Sky, and Land*, and two very



delicate architectural views. Altogether there are over 200 works in the Invitation Section by fifty of the foremost workers of to-day.

To come to the local exhibits, which are about as numerous as the invited ones. Many were rejected for want of space. We find two of the local professional photographers much in evidence. Mr. W. W. Winter sends frame after frame of first-rate cabinet portraits of the County Council, Derby magistrates, Town Council, and Board of Guardians—all so good that they might be machine-made rather than the work of a human being. He has another frame of larger work, printed in red chalk; but, though the work shows evidence of care and taste, the way in which the prints are displayed—on "rumpled" green velvet—is anything but pleasing. It is a pity professional photographers will not learn from their humbler amateur brethren and frame their exhibits quietly and not loudly. The same loudness is evident in the works of Mr. Dereské; he has a large portrait of a girl, No. 415, which might well have been smaller. This girl, Mr. Dereské tells us, is *An Orange-seller*. We will not contradict him, but we should be sorry to give twopence for all the oranges she ever sold. She may have oranges in the tray under her arm, but the leaves among the oranges are not orange leaves, they are more like daffodil leaves. The pose of the girl is good, but one wishes in vain for a little more nature and a little less art. We hope some day Mr. Dereské will take his camera to sunny Africa or Spain and bring back another orange-seller, perhaps not so perfect but more natural. That he can do simple, truthful work is proved by the landscape with cattle, which shows in No. 410, a *View in Dovedale*, and also by No. 404, a *Study of a Head*, which is printed somewhat after the Bergamasco style—a vignette, with the edges dark instead of light. Mr. Winter's and Mr. Dereské's works were not for competition, and the same was the case with the views sent by Messrs. R. Keene, Limited. For us to criticise the work of this firm would be absurd. All the world knows that, if there are perfect negatives from which perfect prints in platinotype are made by the thousand (for the late Mr. Keene was the first professional worker to take up and master platinotype printing) anywhere, it is at the works of Messrs. R. Keene & Co.

Of the work shown by the members of the Derby Photographic Society, that of the Vice-President, Mr. W. R. Bland, takes the first place; all this gentleman's exhibits were sent in marked "not for competition." If one of his pictures—we use the word picture in its highest sense—is better than another, it is No. 822, an interior view of Wirksworth Church. Every one who has studied either photographs or photography knows how the camera almost invariably fails with interior architectural views, how it never seems to render the feeling which must impress all but the very cheapest cheap tripper when he enters a church or cathedral. The usual interior view gives us every stone, every joint, every tile, every window, every lead, but nothing more; the effects of light and shade, which make even the newest churches at times quite poetical, seem to be things architectural photographers dread, just as, when the collodion process was first introduced, photographers generally waited till the sun went in before exposing. The photograph of Mr. Bland's proves that he has had no such fear, and that he has determined to catch the sentiment of the scene, whether he got every stone or not. Two rays of sunlight have given him what he wanted to express himself with, the rest he got by infinite pains and care; that nothing is left to chance, as some so-called artistic photographers leave everything, is evident, for the photography is perfect, there is gradation everywhere. The sight of this single photograph will open the eyes of every thoughtful person to the possibilities of photography; if more work like this was made, we should never hear of the reproach, "only a photograph." Mr. Bland has fifteen other works, all of which show the same reverence for what is beautiful and the patience which must accompany artistic feeling if good work is to be done.

Taking the works which were fortunate to be medalled first, we come according to the catalogue to No. 252, *A Chester Street*, by F. C. Smithard. Though this view is only about six inches by four, it has that most important quality, breadth; a mass of buildings on the right, their edges picturesquely broken against the sky beneath; to the left only a roadway showing tram lines, these lines leading into the picture. Though there are no figures walking about all over the road which make street views usually so unsatisfactory from a pictorial point of view, there is sufficient life to prevent the view appearing to be one of a deserted city. Mr. Smithard has other good work, notably No. 246, *The Woodside*. The next medalled print is No. 271, *Cromford Church and Bridge*, by George Walker. Though churches and bridges are not usually picturesque materials, there is enough of other material here in the shape of trees, water, fields, and sky to make a pleasing composition; the print is a platinotype of first-rate quality, we might say

the same of most of the other works of the local society. No. 285, *The Castle Gateway*, took a medal; if it had not done so, one of its companions, Nos. 282, 283, or 284, undoubtedly would have done. The next medalled exhibit is No. 288, *From the Storm come the Floods*, by Mrs. F. H. Gandy, which gives us a pleasing composition of woodland, water, and wet land. The next fortunate one is the work of Miss Evelyn Boden, F.R.P.S., No. 308, *A Little Dutch Mother*. Miss Boden aims even higher than most of her fellow-members. She has a soul above pretty bits, and, as her work shows, is already very successful at making pictorial portraits and groups; her medalled picture shows a young woman in a quaint Dutch head-dress bending over a cradle, making it ready for her babe, the treatment is simple and the picture is not spoilt by the addition of unnecessary accessories. Miss Boden has also a charming group, No. 309, of *Mrs. Gisborn and Children*. The expression on the boy's face in this is happy indeed. Her No. 298, *Christopher Wilson*, and her No. 311, *Zoe*, are both head and ears above most professional portraiture. Charles J. Allen gets a medal with No. 339, *Autumn*, a roadside view taken at just the right time of day, with atmospheric conditions all helping. A cottage and bankside in shadow coming against a lighter bend of the road, at a point where the lines of the road and trees lead to, arrests the eye at once. The remaining medal went to E. J. Highton's *Wrotham Broad*; other seven works by this exhibitor were all equally good.

Among the works which were very nearly of equal merit to the above-mentioned, if we except Miss Boden's works, we might say were of equal merit, we noticed No. 259, *Chee Tor*, by Thomas Walker, a platinum print, which reminded us of a well-printed carbon opal of a peep which might well stand for a view into Fairyland. Four works by Arthur J. Haynes, No. 267, looked almost too dark among so many sunny pictures. No. 268, *Underground Life—Loading Coal*, was certainly worth distinction. There are also two frames of Alpine views (No. 383), by Charles Bourdin, which were fine, except a few small figures with their eyes on the camera, well-nigh perfect. Space alone prevents us from mentioning more of the 200 excellent works of the Derby Society.

The ceremony of opening the Exhibition was performed by the Mayor of Derby (Alderman Ann), who invited a large company of guests to meet the members of the Derby Photographic Society at the Art Gallery on Tuesday evening. A letter of apology, regretting his inability to attend on account of a cold, was read from Captain Abney (the President of the Derby Society), by Mr. Crowther (the Curator). After the company present had spoken to their friends, and tried to get a peep at the pictures, they went, at the invitation of the Mayor and Mayoress, to take refreshment and cooler air in the lower gallery of the buildings.

## FOREIGN NEWS AND NOTES.

**Metol Developer.**—Dr. Haschek states that he has found that, when a metol developing cartridge is dissolved in hard water, development is much slower, the negatives are more brilliant and do not lose so much in the fixing bath, and that it is possible to thus correct over-exposure. Still better results, he says, are obtained by using lime water made in the ordinary way by adding quicklime to ordinary tap water, allowing to stand and then filtering.

**Light-sensitive Copper Salts.**—Schneeberger has made a series of experiments with copper salts as a substitute for silver. Cuprous iodide ( $\text{Cu}_2\text{I}_2$ ) damped with ammonia, was exposed to sunlight, half being covered over with an opaque card. The exposed part turned a deep blue, whilst the unexposed remained only a pale blue. When air was excluded from it, the exposed cuprous iodide blackened in proportion to the exposure, the unexposed part being white. An emulsion of the iodide was made in gelatine and sensitised in weak ammonia, and the air excluded by petroleum, and a plate coated with this was exposed whilst in the ammonia. It blackened on exposure, but again became white when placed in the dark. When the plate was taken out of the sensitiser, washed, and treated with dilute sulphuric acid, it developed up with a black colour. An emulsion of cuprous oxide ( $\text{Cu}_2\text{O}$ ) was also made and exposed, with exclusion of air, in water acidulated with sulphuric acid, and this also blackened, and kept that colour when washed and dried. In this case fixation was effected by means of dilute hydrochloric acid.

**A Film-flattener.**—Dr. Lenz-Bern states that films which have a tendency to curl are rendered quite flat, if they are laid face downwards in the middle of about sixteen sheets of smooth writing



paper, and then ironed with a flat iron, heated so that it will just sizzle when touched with the wet finger. It is stated that this makes the films lie absolutely flat during development and the subsequent operations, and that it has no prejudicial effect on the emulsion.

**Bromised Developing Agents.**—Dr. Lüppe Cramer one of the chemists in the laboratories of Schering's, has observed that the substitution of bromine or chlorine for a molecule of hydrogen in pyrogallol or hydroquinone gives some very valuable developing agents. Bromo-hydroquinone gives much softer and more harmonious negatives than hydroquinone with equal exposures, and this is particularly noticeable in the shadows with short exposures. Bromo-pyrogallol is one of the most rapid developers known. These bodies are easily prepared by adding to the mother-substance, hydroquinone for instance, dissolved in benzole, the necessary quantity of bromine also dissolved in benzole. The reaction takes place instantly, and hydrobromic acid is set free, and the solution is then evaporated to crystallisation. Chloro-hydroquinone is obtained by passing chlorine gas into the benzole solution. Bromo-hydroquinone has been introduced commercially under the name of adurol, which keeps for a very long time in a concentrated solution, and has no action on the fingers. The formula recommended is—

Water .....	200 parts.
Sodium sulphite .....	75 "
Potassium carbonate .....	150 "
Adurol .....	15 "

For use, dilute one part with from ten to fifteen parts of water.

**Three-colour Screens.**—In a little work recently published, entitled *La Photographie des Couleurs*, M. G. Naudet recommends the following solutions for bathing gelatinised glass for making screens for three-colour work:—

<b>1.—REDDISH-ORANGE SCREEN.</b>	
Bluish eosine .....	2 parts.
Naphthol yellow .....	1 "
Water .....	100 "
<b>2.—GREEN SCREEN.</b>	
Sulpho green S. ....	2 parts.
Naphthol yellow .....	2 "
Water .....	100 "
<b>3.—BLUE-VIOLET SCREEN.</b>	
Methylene blue .....	2 parts.
Paris violet .....	2 "
Water .....	100 "

For the yellow negative an ordinary Lumière plate, with No. 3 screen, should be used; for the red negative a Lumière A plate, with the green screen, should be used, and the increase in exposure is about five or six that for the yellow; for the blue a Lumière B plate, with the orange screen, should be used, and the increase of exposure is about fifteen to twenty times that for the yellow negative.

**Glass Tanks.**—For three-colour work it is customary to use either collodion or gelatine screens stained with the necessary dyes, but cells with parallel sides for holding solutions of the dyes are preferred by many. These cells are generally used immediately in front of or behind the lens, and it is then necessary that they should have optically polished sides which must be absolutely parallel to one another; the cost of such cells is very great, and to get over this difficulty D. Cellarius & Co., of Markirch have introduced cells of exactly the same size as the plate, and a set of three for 18×24 cm. plates costs only 5*frs.* They are placed just in front of the plate, where any slight variation from parallelism is of no moment.

#### PICTURE FRAMES.

[Abstract of a paper read before the Society of Arts by Mr. J. Hunter Donaldson.]

At the British Museum Dr. Murray kindly pointed out their oldest frame, of about the second or third century of our era; it is of a hard wood-like beech, of what we know as the "Oxford" pattern, with a marginal 1-inch flat, a groove to receive glass, and cord to suspend it by the corners. The panel had a portrait of encaustic, now nearly obliterated. I also saw an engraving of a Pompeian studio in which a lady artist is sitting, with a similar frame and portrait in it near her. We then went

to the finely preserved mummy from Hamara in the Fayoum, of a young woman once of much beauty, whose portrait on a 12×9 panel is at the head, with a framing of many folds of the cere cloth, which is ingeniously swathed so as to form a geometrical pattern all over the body. I am told that poor Egyptians, who could not afford to have such portraits painted expressly for their lost ones, used to buy, from stocks of ready-made portraits, such as most nearly resembled the deceased, and, when the swathing cloth decayed, such portraits were hung up as pictures. It was a custom of the Romans to have upon round or shield-shape wood portraits called "imagines" of their celebrated dead, modelled in coloured wax, to carry these in the funeral processions, and afterwards to suspend them in the houses.

We know that the ancients painted in every style of art, excelling in all, and, though Pliny says that "the greatest glory was obtained by easel pictures," he gives, as another reason for preferring them, the fact that paintings upon the actual walls cannot be saved in case of fire. We read that Cicero sent large sums of money to his friend Atticus, to buy pictures in Greece, for decorating his villa at Tusculum, and artists of distinction, like Polygnotus, must have been well aware of the importance and effect of suitable frames for their masterly works.

That no examples of beautiful ancient frames can now be found is not surprising, for we are told that the anti-pagan zeal of the early Christians led them to destroy everything they could which was pagan, however artistic; they used to put ropes round the marble necks of the almost divinely beautiful Apollos and Venuses, drag them into the open, try them in public like criminals, find them (of course) guilty, and then pound to dust statues by men whose names we reverence to-day. Thirteen hundred years later a religious zeal, not according to knowledge, led Cromwell's troopers to stable horses in Worcester Cathedral, whilst money was actually paid for the destruction of stained glass which we should now consider priceless. We do, however, owe to the "Protector" the purchase of Raphael's cartoons for the nation. I mention this, because it explains the reason why no frames have been handed down to us by which the subject can be illustrated.

Persons who will take the trouble to examine the frames used by the older English masters in oil and water colours will notice the poverty of design and the want of taste of most of them. This was felt so much by the leading artists in the sixties, that they were led to make great improvements, and, *à propos* of the common-place expression, "What a beautiful frame," uttered sometimes by those incapable of judging the merits of a picture, two articles appeared with illustrations in the *Architect*, exactly thirty years ago. These were written by Mr. Phené Spiers, Master of the Architectural Schools of the Royal Academy, himself an accomplished artist. He said, "In a frame lies a not inconsiderable portion of the completeness of a picture, and there are fortunately a few painters, Mr. Leighton notably among them, who have long recognised the fact that their powers of imagination and composition ought not to terminate with their canvas." Mr. Spiers ably criticises the frames in the Exhibition of the Academy in 1869, and we shall have details of those frames on our screen, with his remarks for our information.

Fourteen years ago, Mr. W. R. Lethaby, in an able paper, drew attention to the poverty of design in frames then exhibited, with some remarks to which I shall refer later. Before this time much attention had been given by foreign artists to their frames, which were not unfrequently designed under the influence of the best Italian period, some examples of which will be shown. We are justified in expecting that since the year 1869 an advance should be seen in the designs of frames, especially by our principal artists, and some of the more recent ones will be displayed. We may soon hope that, when the expression "What a beautiful frame" is heard, it may be found to proceed from a person whose cultivated taste and sense of beauty apply equally to the work of a true artist in his picture and in the frame he has designed for it.

I do not think it can be claimed for the frames in this year's Academy that they show any advance in design upon those of thirty years ago; some of the largest are defective in architectural detail, and some have large, busy, obtrusive mouldings close to the pictures; there is a noticeable display of old frames, for which there is now great demand, and for the first time we see a number of gilt frames toned almost to the colour of wood; some of the most grandiose lack the refinement of those of 1869, and, although there is undoubtedly more variety than formerly, there appears to be less purity of taste. The true relation of a frame to a picture has probably never yet been the subject of a lecture to students, and the very alphabet of this phase of art is unknown to thousands of them.

I will refer to four frames. I assume my hearers have been to the New Gallery and seen the work of Mr. Holman Hunt, *The Miracle of Sacred Fire*, in the Church of the Sepulchre at Jerusalem. Mr. Holman Hunt has put fourteen figures in groups on the frame with a seven-branch candlestick in the centre, and he has modelled all these in gesso; the frame is gilt and it requires toning, but apart from that it is interesting. The curious thing is this, he has made a pediment and rested it, without any frieze, on two pilasters. He has ignored, in the most flagrant manner, the ordinary principles of architecture. In many frames at the Academy there are obvious departures from the recognised principles which govern such work. My friend Mr. Chapman, from Paris, sent me the *Journal des Débats*, in which a picture by M. Roll is mentioned. The



subject of it is *Laying the First Stone of the Bridge of Alexander III. in Paris*. Mr. Michel, the critic, says:—

"The frame is a great low relief of wood with unequally projecting allegorical figures; below is a Siren advancing from the prow of a barque, the oars of which seem to come from the fore part of the picture above, rays of light appear to drive the nocturnal owl into a corner; on the sides are Peace, Abundance, and the Arts. This frame is a work of much pride to the distinguished artist designer."

The frame which can perhaps take the first prize for eccentricity, at all events in the English galleries, is the frame designed by Mr. R. Machell, R.B.A., for a picture called *Parisfal*. It must have been the subject of immense care and study by a highly intelligent man, and, no doubt, a true artist. I think you will agree, on looking carefully at it, that you would be sorry to live with it; and, secondly, that it is the most ambitious and least successful of frames this year. Incidents and characters of the subject are carved on the decorated frame, the centre being occupied by *Parisfal* raising the cup of the Holy Grail. In the picture of *Psyche's Bath* Lord Leighton has carried some details of the frame into his painting, but Mr. Machell has deliberately carried a large part of his subject into his frame; happily he is in this alone among English artists.

Not a little of the effect of picture frames depends on their being hung in a suitable light; a side light in a too projecting frame may cast an injurious shadow. Not long ago I saw an exquisitely carved frame and an equally beautiful panel in low relief, placed between the two windows of a room; the work cost 1200*l.*, and was practically lost for want of the side light which all such works should have. *Apropos* of this, we may recall the story of Douglas Jerrold and Albert Smith going to a picture gallery. On the stairs was a mirror, standing before which Albert Smith said, as he looked into the glass, "Ah, my boy, there's a picture!" "Yes," said Jerrold, "It wants hanging!" So, when we have a good picture in its proper frame, we must not forget that, as Jerrold said, it "wants hanging," and that carefully, in justice to the artist.

We must all have observed the great value of black in frames, especially in works of the Dutch and Spanish masters, sometimes with bands of tortoiseshell or fine lines of gold, with the varied and very characteristic wave mouldings which had their origin in Spain, and were adopted in Italy and Holland, the Dutch artists especially recognising the suitability of such framings for their paintings. Mr. Watts was among the first to observe this, but, curiously enough, the least happy use of black is perhaps in the large works of Mr. Watts at the Tate Gallery, where, at a little distance from them, broad bands of gold separate, instead of combining, the frames and pictures; this rarely occurs in the foreign examples. There are some good black and gold frames in our national galleries, and, as we know, in the mezzotints of Bartolozzi, Ward, and others. Black behind the glass, with gold lines and delicately moulded gilt frames, gives great charm to the works of their time. The neglect of proper framing by early and very able masters in water colour is surprising, in view of the seventeenth and eighteenth-century framing known by them, some of their finest works being injured by mean and meaningless surroundings. Men of acknowledged eminence, even in our own day, have not troubled themselves to consider the art of framing. It will, I think, be a matter of surprise that our noblest writer and critic, Mr. Ruskin, has not yet treated this subject in any of his beautiful works, and in many of those of authority upon painting which I have consulted no reference to frames is made. I do not absolutely affirm that Ruskin never made such a reference, but I have spent a whole day in going through his works, and I could not find a single reference to picture frames, which is a remarkable thing. The most noticeable of English designers of frames is Grinling Gibbons, born in London in the latter half of the seventeenth century. He was recommended by Evelyn to Charles II., who commissioned him to execute the ornamental carving for the Chapel at Windsor; he also did the foliage and festoons of the Choir of St. Paul's, the baptismal fonts in St. James's, Piccadilly, and works at Petworth, Burleigh, and Chatsworth, Hampton Court, &c. His talent was wasted in carving pens and feathers that were mistaken for real ones, flowers which used to move on their stems by the air, &c. We shall all agree probably in thinking such work, however full of loving labour, unsuitable for picture frames, to which it has been applied; the modern English housemaid would soon reduce much of it to matches. On my last visit to Florence I found a fine example of Gibbons' carving in a public museum; and a very ambitious work in South Kensington Museum is his *Stoning of St. Stephen*, probably copied from a painting. With some defects of perspective, it is not "the highest form of decorative design," in which Mr. Ruskin said, twenty years ago, "the English will never excel," but the rare sense of beauty in natural objects, the manipulative skill, and the tireless industry of Grinling Gibbons will always secure a place for him in the annals of art as our most original frame-maker.

As miniatures have always to be examined near to the eye, the effect of any mode of framing has not seriously to be considered; the oval form is obviously the best and most generally used, but the marked advance of this form of art has led to the adoption of square or oblong frames, generally in ornol; these are not, however, quite within the scope of our paper. In nearly all the oval frames there is a gold moulding round the picture, and that flat moulding is burnished highly, so that it is difficult to

look at the picture without the glitter of the thing coming to the eye, and it impairs the work. Now, whatever our objection may be on patriotic grounds to things "made in Germany," it is only just to admit that we owe to that country the introduction of highly finished frame mouldings in colour and gold, well suited for drawings, engravings, and the many and beautiful developments of photography; we have "bettered their instruction" with our framings in light and dark oak, walnut, and the shades of stained-green ash and oak which, with delicate gold lines, give such charm to these latter-day works.

The Americans, too, have entered this field, and now Messrs. Graves & Co., of Pall Mall, have frames of their make decorated in the "Adam" and "Empire," and other styles, with ornaments laid in gesso, on stained maple, walnut, oak, in tinted ivory, on neutral green, in bronze, on black, &c., of great variety and with harmonious effect. The style employed has perfect examples all around us, well known to art-lovers, but it has remained for our cousins to glean the field which was sown here and abroad a century ago, and the mezzotints, now so much sought, are charming in these surroundings. The Autotype Company have courteously sent some specimens of their less elaborate but highly artistic frames, and I cannot imagine any more suitable than these for the charming photographs with which they have made us so familiar.

[Having called attention to six frames, which Mr. Donaldson said were admirably adapted for the works they surrounded, he drew attention to some frames lent by Messrs. Goupil & Co., which he said represented what gilt frames French taste preferred. English frames designed by the artists were of more refined character, and had more appropriateness in connexion with the pictures. He next referred to some wood frames made in Florence, and drew particular attention to the extreme care taken to make the moulding intersect at the corners. After describing some slides, kindly lent by the authorities at South Kensington, Mr. Donaldson proceeded.]

The Florentine modern frames of carved wood, as you will see, have delicacy and beauty of detail; more elaborate and necessarily more expensive, they are of great technical merit, and are superior to any machine-made ones. Messrs. Goupil & Co., of Regent-street, have also lent gilt frames of marked character and high finish, with some others specially suitable for works in oil. Messrs. Gillow & Co., of Oxford-street, have kindly lent a variety of interesting and artistic frames of Italian and English make.

Now, a serious impediment to the art of frame-making is the rule of our Royal Academy not to admit any other than gilt frames. I do not know in whose prejudice or interest such a regulation originated, but I am confident of the support of able artists in saying that it should be rescinded, and that in doing so an impulse would be given to the production of truly artistic frames in gesso and in carved and decorated woods, such as we see abroad, and enormous additional effect would be secured for paintings at every yearly exhibition. I earnestly hope that the enlightened President will soon distinguish his reign by effecting this much-needed reform. The beautiful and allied arts of modelling in gesso, carving, inlaying, decorating, and enamelling would be stimulated, and public encouragement be quickly given to such a progressive measure. I invite the opinion of the Chairman with regard to that.

The material objection, I believe, is want of space; but, as Disraeli said, "a difficulty is a thing to be overcome," and, by excluding works of a secondary character, the experiment might be made of giving one room to some of the measureless variety of artistic frames other than gilt ones. I am fortified in this hope by the fact that for the first time we see in the Academy this year some frames with the gold toned down to almost the colour of wood in pictures on the lines. That is an enormous concession to the idea that frames might be improved and other than gilt. Oh for another Alfred Stevens who would, with proper encouragement, and with his unequalled genius, have created a school of artist framers as fine as any known to the world! We are, as Mr. Lethaby wrote in 1885, still waiting for an inspired artist worker, who must be free and with pride in what he creates; he will be, as Stevens was, familiar with the glorious old Italian methods, and will, I trust, be able to overcome the narrow-souled economy of even a minister of public works; then, indeed, it may be possible to read of an Academy picture some such notice as this:—

"The Florentine, Simoni Ceni, wrought the carving, and Gabriello Saracini gilded it, Spinello of Arezzo did the painting in 1385"

In lending these kakemonos and frames seen, Mr. Phené Spiers says:—

"It has struck me that a few words on the framing or mounting of drawings in Japan might not be without some interest, seeing that, until within the last few years, their methods have been carried on for centuries uninfluenced by the customs or practices of other nations."

"The Japanese have two methods: the kakemono or hanging picture, suspended temporarily only in the house or temple, and otherwise kept rolled up and preserved in the goldown, the fire-proof store-room; and the framed drawing hung up in the temple or carried about in processions. In the latter case the frame consists of a simple convex moulding, the width of which varies from half an inch to six or seven inches, according to the size of the picture, and this moulding is painted over with body colour with natural flowers (as in one of the examples shown), or with geometric patterns, leaving the



grain of the wood as a ground, or again with sprigs, leaves, and flowers modelled in gesso (as in a recent example). Sometimes the frame is coated over with black or green lacquer, on which geometrical patterns or sprigs of plants are cut through to show the white wood. The more elaborate frames are richly decorated with aventurine lacquer, with geometrical patterns in gold lacquer, and the angles and sometimes the longer sides are strengthened and decorated with brass plaques incised with ornament. The drawing in these cases comes close up to the frame, with a border of black or red lines to isolate it from the frame.

"The kakemono, or hanging picture, is mounted and decorated in a conventional manner, which is apparently always rigidly adhered to, and which seems to have existed for centuries. The drawing is mounted on linen or paper, with a margin of from two to four inches on each side, and from two to four feet top and bottom, the lower border being about half the depth of the upper border. At the top and bottom of the drawing is a narrow strip of damask, the upper twice the width of the lower; on each side of the drawing the 3-inch margin is covered with damask or silk of a different colour, the depth of the border above (6 to 8 inches) being about twice that of the lower border. Beyond this, above and below, covering the remainder of the mount, is a flowered silk or gold damask ground, with again double the depth at the top, a wood roll at the bottom, with ivory or polished ends, serving for rolling up the drawing; at the top is a semicircular roll with rings to suspend the kakemono. From this upper roll hang two strings or tapes of the same material and colour as that of the upper mount, the original object of which is not clear, probably it is a revival of a custom of tying up the kakemono, but they are never missing. The damask or silks which form the borders are, as a rule, of much greater value than the drawing, and it is probable that the professional mounter, or perhaps the owner of the drawing supplies these materials, which are the remnants of ancient dresses either belonging to the family or acquired from actors. The latter, as may be seen from the Japanese colour prints, wear the most gorgeous dresses, and, when done with, these would seem to be cut up and utilised, either for the purpose above stated, or as bags for precious pieces of lacquer, ancient tea jars, or masks. In the two examples exhibited one is a Buddhist kakemono, which was probably hung in a temple, the other has mounts of blue silk and ancient damask, which are really of much greater value than the drawing they frame, and of great beauty of colour."

A reference must now be made to "mounts," which are so extensively used; and of modern artists Sir Edward Burne-Jones is the one who has given most attention to them. Some of his designs are marvels of elaboration, and these recently seen at the Burlington Fine Arts Club were striking evidences of his fertility and refined taste. Ruskin says, "All noble ornament is the expression of man's delight in God's work," and "genius" has been defined as "an infinite capacity for taking trouble;" these Burne-Jones undoubtedly had. A short list of his frames, mounts, and grounds may be of use for future reference, and I therefore give the following examples:—

1. Inch plain oak frame, natural colour, mount deep cream, for sketch on lighter cream ground.
2. Same frame, mount warm stone, for drawing on soft red ground.
3. Same frame, flat reeded, mount 4-inch stone, coloured with  $\frac{1}{2}$ -inch gold band near the deep bevel,  $\frac{3}{4}$ -inch band of deeper stone colour next to gold, with black fine lines ruled on the gold and to outline the band.
4. Frame 1-inch reeded walnut, mount 4-inch grey-green,  $\frac{1}{2}$ -inch band of gold, 1-inch deeper grey-green, then another  $\frac{1}{2}$ -inch band of gold, lines of black on gold bands, for drawing in pencil on light cream colour.
5. A 2-inch reeded teak, coloured oak frame,  $\frac{3}{4}$ -inch gilt flat, for drawing on brown paper.
6. Same frame, flat of  $2\frac{1}{2}$ -inch light unvarnished oak, deep bevel, near which is a fine gold line, and another  $\frac{1}{2}$ -inch wide, outlined black, for a richly coloured sketch of King Cophetua.
7. One-and-a-half-inch flat black-polished frame, with a groove in centre, for chalk drawing on brown paper, very narrow gold flat.
8. Inch reeded light oak frame, mount light brown, very thick, and bevel cut so as to show various layers of the paper, for drawing on cream colour.
9. One-and-a-half-inch walnut frame, flat fluted, mount 4-inch warm stone colour, with deep plain line indented near bevel, for drawing on brick-red paper.
10. Frame  $1\frac{1}{2}$ -inch flat, with 3 grooves, green-gold, mount cream colour, band of  $\frac{1}{2}$ -inch green-gold near bevel, for etching in silver and gold on deep grey ground.
11. One-and-a-half-inch frame, black, slightly elliptic, with fine gold hollows on the edges, gilt narrow flat in some cases, and in others 4-inch gold mounts, where the print or drawing is strong in colour.
12. One-and-a-half-inch reeded walnut frame,  $\frac{1}{2}$ -inch mat flat, an oval inside of plain light oak, with fine gold hollow, forming sight, for portrait in black chalk on cream of light tone.

In conclusion, we may notice some changes in the last twenty years or so; a much more general employment of glass for oil paintings under

suitable conditions of light, and for their protection in our climate; this has to be sometimes done, as in the Tate Gallery, by an added moulding, not improving to the frame. Another is the more general practice of framing water-colour works as if they were in oil; this may properly be done when the colouring is of sufficient strength, and in all works there seems a tendency to employ broad bevels in place of the large gilt flats, and to allow the glass to cover them.

I submit for consideration some propositions arising from what has been said:—

1. That, whilst the frame should be designed with reference to the picture, and may, in some cases, have details emblematic of the subject, it should not attract undue attention, or be eccentric; rustic subjects should not be put in highly enriched frames.
2. That the enriched mouldings of frames should diminish in importance as they approach the picture.
3. That works, not of much strength in water colour, should have broader flats than those in oil, and not heavy gilt frames with much burnish.
4. That some pictures (like Lord Leighton's) are best without any burnish in the frames.
5. That landscape pictures, in most cases, are better in recessed than in projecting frames.
6. That the colour of a mount should not appear to blend with any part of the picture it surrounds.
7. That the gold in all frames should be toned to suit the pictures.
8. That some works have their best effect in carved wood, brown or black frames, with or without fine lines of gold added.
9. That strongly marked carved lines in frames, with corners and centres in high relief, are often injurious to the composition of line in the pictures.

#### THE ALIENATION OF WORKS OF ART AND THE RIGHT OF REPRODUCTION.

At the Third International Congress of Publishers, held in London last week, M. Lucien Layus, of Paris, read a paper on the right of reproduction and the property of drawings ordered for illustration work.

The artist who sells a picture or a design is presumed to have ceded only the material property of the work. He remains free to dispose as he thinks fit of the right of reproduction. The owner of the work who wishes to make use of the right of reproduction ought, therefore, to show proof of his having acquired this right from the artist or his assigns.

The Artistic Congress of Paris (1889), the Berne Conference (1889), the International Congress of Literary and Artistic Property, London (1890), Neuchâtel (1891), Milan (1892), Barcelona (1893), Dresden (1895), and Monaco (1897), have declared themselves of this opinion, and have expressed the wish to see all the countries of the Union agree among themselves to recognise that the alienation of a work of art does not in itself involve the transfer of the right of reproduction.

This principle has been generally acknowledged. In Great Britain and Columbia, however, a contrary principle is recognised. The English law of July 29, 1862, relating to works of art (Art. 1, par. 2), stipulates that the artist who sells his work does not retain the right of reproduction, unless he reserves it to himself by special agreement signed by the purchaser at the time of, or previous to, the sale.

The French law does not refer to this matter at all, but the Court of Cassation, in a judgment given by the united sections, on May 27, 1842, has decided that the alienation of a work of art conveys with it the full and absolute property of the thing sold with all rights and privileges appertaining thereto, including the right of reproduction.

M. Layus examined at length the serious disadvantages of the principle recognised by the English and Columbian laws and by the French jurisprudence, and moved the following resolution:—

"The Congress of Publishers expresses the wish that all the countries of the Union should agree to recognise that the alienation of a work of art should not by itself carry with it the transfer of the right of reproduction."

In the second part of his paper M. Layus considered the respective rights of the artist and of the publisher as regards the property of the original. He expressed the opinion that, unless otherwise stipulated, the material property should remain with the publisher who ordered and paid for this drawing.

The presumption is that the publisher has acquired both rights, since he ordered the drawing, that is to say, considered the eventuality of the possession of the work and of the right of production, and proposed a resolution to that effect.

The President remarked that in France drawings intended for publication remained the property of the publisher.

Mr. Bell, London, asked what would be the position of a man who desired an artist to produce the picture of a horse. Would he have the right to reproduce the picture, or would that right be reserved by the artist?

The President replied that this would depend entirely upon the agreement come to between the person ordering the picture and the artist. If the former stipulated that he wished to reserve the right of reproduction, then the artist could take no objection.



Mr. Bell remarked that the point did not seem to be quite clear. The Chairman's remarks only referred to cases where a distinct agreement had to be made. But what would be the standing of the parties where no special agreement existed?

Mr. Guinnis suggested that they should have a distinction between a picture which a person purchased and one which he ordered, as to the right of publication.

The President said that in France books were published for circulation amongst a limited number of people of a special design. The design was then sold, but it could not be used for a second publication unless there was a stipulation to that effect. A person who paid half-a-crown for a book could do what he liked with it, with the exception, of course, of republishing it. He considered that the same law should apply to a work of art.

Mr. Bell stated that in England, if a person purchased a picture, he could have no right to reproduce it; but, when a publisher ordered a picture to be drawn or painted it should be understood that the copyright went to the owner of the picture.

A resolution put by M. Lucien Layus, Paris, "That the Congress of Publishers express the wish that all the countries of the Union should agree to recognise that the alienation of a work of art should not by itself carry with it the transfer of the right of reproduction," was then put to the section and adopted, only four members voting against it. As a complement to the foregoing, it was decided that the expression of the opinion of that Congress should go forth that a drawing, ordered by a publisher from an artist for the illustration of a publication, should remain the property of the publisher unless otherwise stipulated.

#### ADUROL-HAUFF.

MESSRS. FUERST BROS. have sent us the following report on Adurol-Hauff by Dr. A. Bogisch: Under the name of Adurol, Messrs. J. Hauff & Co. and the Schering Chemical Works are bringing forward a new developer which, in spite of the increasing number of developers which have been introduced during the last decade, has a great amount of interest and will find favour even in the most conservative circles.

This new developer is really an old friend whose good and bad qualities are already known, but it is brought out in an improved form as the chloride and bromide substitute of the well-known hydroquinone (commonly called quinol).

Both the above firms have simultaneously discovered the great developing powers of adurol, and have resolved to combine in putting same on the market, being well protected by patents.

As regards the special qualities of adurol, the same show the advantages of hydroquinone in a greater degree without possessing its disadvantages. The disadvantages of hydroquinone generally are (1) the great amount of alkali required to increase its developing powers, (2) the very slow appearance of the image, and (3) the influence of low temperatures, which in the winter-time practically precludes its use; as the low temperature causes the image to appear slowly, hard development ensues, therefore hydroquinone is known as a "hard developer."

Of course, one of the advantages of hydroquinone is the good density which can be obtained with it, and which no other developer exceeds. As against the above disadvantages adurol has the following advantages:—

It requires only a very small quantity of alkali, in fact, the potash can almost be replaced by soda, the use of caustic alkali being entirely unnecessary. In spite of the small quantity of alkali, the image appears very much more quickly and, what is most important, a low temperature has practically no influence on the appearance of the image on development.

The most important property of adurol, however, is its power to give density, which is not attained even by hydroquinone and caustic alkali. Taking these properties into consideration, adurol is not what one would call a "rapid developer" like hydroquinone and caustic alkali (with the latter it only shares the power of giving density but not the rapid development), apart from the fact that adurol works free from fog until development is completed (which cannot be said of hydroquinone and caustic alkali). With adurol the image appears in about twenty seconds (that is, normal rapidity) and builds up gradually, and after about four minutes the necessary density in the high lights as well as in the details is obtained. The density does not therefore cover the high lights alone, but as development proceeds the details become dense in an equal manner, so that an harmonious, graduated and, we may say, more soft rather than hard negative is the result.

It is therefore clear that when using adurol the time of exposure, as against hydroquinone, can be reduced; in other words, even when exposures are made in very dull weather, in the studio, when snap-shots are taken, or when taking animated or X-ray photographs, adurol will answer for development where hydroquinone is absolutely useless. Nevertheless, hard negatives can be obtained with adurol, when required, by a judicious mixing of "neud solutions," and by the addition of bromide, or, where over-exposure has taken place, development can be easily regulated.

Bromide solution with adurol has a very effective retarding influence, although, perhaps, unusually large quantities may be necessary (as com-

pared with hydroquinone); that is however no fault, in fact we might say an advantage, because, by the addition of bromide, the used developer retains its developing properties much longer, and can be used oftener than is the case with hydroquinone. When experiments are made in this direction, it is astonishing what amount of work can be done with adurol. The solutions have extremely good keeping qualities, not only in the separate, but also in the mixed state. An adurol solution made on June 17, 1898, is to-day absolutely clear and possesses full developing powers.

The adurol manufactured by Messrs. Hauff is the chloride substitute—that of the Chemical Works, Schering, is the bromide substitute—of hydroquinone, but both are identical in their action.

The chloride substitute of hydroquinone is a white crystalline powder, which is much more soluble in water than hydroquinone.

The following is a formula which has been thoroughly tested, and can be recommended:—

#### 1. Adurol-potash developer.

A. Adurol .....	25 grammes, or 80 grains.
Sulphite of sodium, crystallised 200 .....	640 "
Water .....	1500 c. c. 10 ounces.
B. Potash carbonate .....	100 grammes, or 1 ounce.
Bromide of potassium .....	2½ " 12 grains.
Water .....	1000 c. c. 10 ounces.

#### 2. Adurol-soda developer.

A. Adurol .....	25 grammes, or 80 grains.
Sulphite of sodium, crystallised 200 .....	640 "
Water .....	1500 c. c. 10 ounces.
B. Soda carbonate, crystallised ...	350 grammes, or 3½ ounces.
Bromide of potassium .....	2½ " 12 grains.
Water .....	1000 c. c. 10 ounces.

With clear working negatives the bromide of potassium may be left out. For studio exposures take three parts A, two parts B.

For landscapes and snap-shots, take three parts A, two parts B, two parts water.

To make a concentrated single solution developer, the following formula is recommended:—

Adurol .....	25 grammes, or 80 grains.
Sulphite of sodium, crystallised 200 .....	640 "
Potash carbonate .....	100 " 320 "
Bromide of potassium .....	2½ " 12 "
Water .....	300 c. c. 2 ounces.

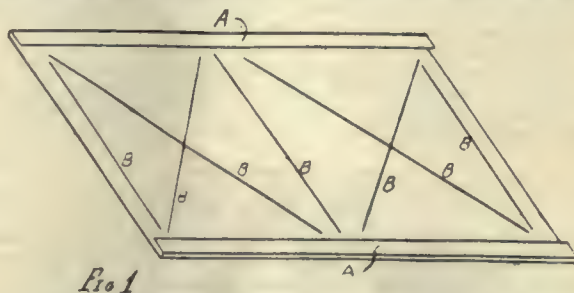
For studio work, take one part developer and five parts water.

For landscapes and snap-shots, take one part developer and seven-and-a-half parts water. The image appears, normally, in twenty seconds, and is completely developed in four or five minutes. For under-exposure, dilute the developer still further. For over-exposure, take a solution that has been already in use, or add to the fresh developer more bromide of potassium. If still greater density is required, same is obtained by the addition of more potash solution.

For developing bromide paper, take three parts A, two parts B, five parts water; or, one part concentrated developer and twelve parts water. For developing this paper, bromide of potassium may be dispensed with altogether.

#### HENDERSON'S FILM-HOLDER.

MR. J. HENDERSON, of Aberdeen, has devised a film-holder which is made of transparent celluloid or xylonite. The edges are turned over upon the surface of the holder, A (fig. 1), so that a photographic film slipped into the grooves formed by the edges being folded over is kept



flat during the manipulations. Longitudinal, cross and transverse indentations, a (fig. 1), are made in the body of the holder, to make it remain flat.

Being transparent, the films may be examined during manipulation without being removed from the holder.

The edges, A (fig. 1) are turned over by means of heat. The indentations are stamped in.



### "LIFTING" DISHES FOR DEVELOPMENT.

Mr. JAMES ROBINS has devised an arrangement which provides the dish with means whereby one end or side of the plate can be readily lifted clear of the liquid so that it can be taken hold of by the fingers without these coming in contact with the liquid.

Fig. 1 is a longitudinal mid-section of a dish, showing the photographic plate immersed in the liquid. Fig. 2 is a similar view, but with

FIG. 1.

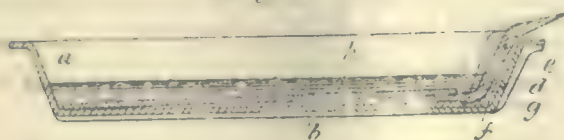
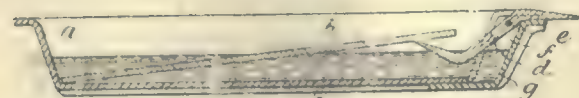


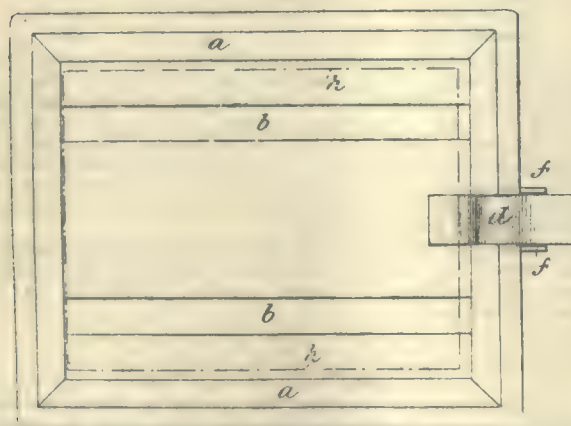
FIG. 2.



one end of the plate raised. Fig. 3 is a plan, the plate being indicated in dots.

*a* is the dish, *b b* are the usual longitudinal depressions in the bottom of same, but these may be dispensed with in carrying out my invention. At one end of the dish is a gap or recess, in which is fitted a bent piece, *d*. This piece is pivoted at *e* between two lugs, *f f*, outside the gap, the space between these lugs being closed at the outer part by a back piece, *g*. *h* represents the photographic plate. When the plate is in the dish, the

FIG. 3.



bent pivoted piece, *d*, occupies the position seen in fig. 1, its inner end lying approximately flat under the end of the plate, *h*. When it is desired to remove the plate, the outer end of the bent piece, *d*, is pressed down by the finger, so as to cause the inner end to rise; the end of the plate, *h*, is thus lifted clear of the liquid, as seen in fig. 2.

It is obvious that other ways of lifting one end or side of the plate can be employed, but the particular way shown is simple and efficient.

The dishes may be made of xylonite or other suitable material, and the parts *f* and *g* may be moulded in one piece with the dish.

### THE JOLY PROCESS.

At the Photographic Club, on June 7, Mr. J. W. Mason showed some of the latest work by the Joly process of colour photography, for which Messrs. Newman & Guardia, of whom he was the representative, were the sole London agents. While, in many respects, the Joly process is similar to that of Ives, it differs in the important fact that there are no three negatives, three positives, three colour filters, &c., but that they remain the same as for ordinary monochrome work. The three colour filters of the process referred to above are, in the Joly process, ingeniously combined in one, the primaries, red, green, and violet, being ruled upon a gelatine base side by side to the number of 240 to the inch. Such a filter is placed in the camera in contact with the specially sensitive plate (the spectrum plate), and the result of exposure is that the

colours of the object photographed are recorded, after development, upon the plate in varying degrees of opacity, the negative being built up of fine lines as is the colour screen. From this negative a positive is made which is bound up in contact with a screen ruled in practically the same manner as the taking screen, care being taken that the red lines of the screen come in line with the particular parts of the positive which are a translation of the reds of the original. This slide is then shown on a screen by projection, and, if all has been done satisfactorily, a more or less truthful rendering is obtained.

Having briefly outlined the process and its principles, Mr. Mason showed one of the improved dark slides for providing contact between the screen and the plate. The screens are, by the nature of their production, costly items, and unless precautions are taken may be easily scratched and damaged. The new dark slide provides a place for the screen and ensures contact of the plate and the ruled surface without undue pressure or risk of injury. Another improvement has been in the reduction of the exposure, which has been reduced to as little as  $\frac{1}{10}$  of what was formerly considered necessary. It was originally stated that only slow plates were of use, and slow spectrum plates were employed, the duration of exposure being as much as two hours in certain cases. By means, however, of a special screen one is able to correct the light-values and use the lightning spectrum plate. The exposure should be gauged as correctly as possible, for upon this the correctness of the colour rendering depends. The Joly Company have recently prepared a piece of thin ruled gelatine, which is placed between the positive and the viewing screen, with the lines at right angles, the effect being to much diminish the mechanical appearance of the ruling upon the screen. It was shown that the task of correctly superimposing the screens and the positives was one of little difficulty, and of this the members were enabled to assure themselves.

Mr. E. J. Wall said that in his work with the Joly process he used collodion plates of his own manufacture. These required an exposure of ten minutes at two feet from two arc lamps, as against fifty minutes for the spectrum plate. He used an intercopter to correct for the colours, having to employ one which was almost pink on account of the excessive sensitiveness of the plate to the green. He was of opinion that the prominence of the red in one of the examples shown was due to errors of exposure. He remembered that in his early experiments he got nothing but red.

### "THE BRITISH JOURNAL OF PHOTOGRAPHY" AND THE LATE CRYSTAL PALACE EXHIBITION.

The following extracts tell their own story:—

"Cosmos" in THE BRITISH JOURNAL OF PHOTOGRAPHY, June 2, 1899:—

"Only twelve months ago the Crystal Palace Exhibition, the largest and most important undertaking ever ventured upon by the Royal or any other British photographic society, came to a successful end. It appears to have escaped notice during some recent celebrations that the Exhibition was originally suggested by this JOURNAL, and that for nearly two years before it was held the idea received in these pages an amount of unlagging and strenuous advocacy, without which it is doubtful if the Exhibition could have been brought to a successful issue. But such is the irony of Fate, all the credit goes elsewhere and so apparently do the thanks and recognitions of a less intangible kind."

From Photography (edited by Mr. Child Bayley) of June 8, 1899:—

"The claim recently made by a contemporary that the credit for the successful outcome of the big Exhibition at the Crystal Palace was due to it, and the ingenious complaint that it had not been paid in any way for its support, reminds us of the old trick which Huxley described as 'the carriage dog policy.' This consists in running before the coach of progress and barking loudly, turning round constantly to make sure which way the vehicle is going. Outside photographic journalism it is very common; we hope we are not going to see much of it inside also, particularly as the trick is so easy that it is not likely to bring much credit."

Extract from a letter from Mr. R. Child Bayley, formerly Assistant Secretary of the Royal Photographic Society:—

"12, Hanover-square, W.  
"May 31, 1898.

"I take this opportunity . . . to say how very deeply grateful I am, personally, for the kind and constant encouragement I have had from you before and during the C. P. show. Its success was due in no slight degree, I need hardly say, to the B. J., and, if the Society owes a debt of gratitude to the JOURNAL, I am sure its Assistant Secretary does to the Editor of the JOURNAL. Be sure I am always yours very gratefully,  
(Signed) "R. CHILD BAYLEY."

### THE TOTAL ECLIPSE OF THE SUN, MAY 1900.

We (*Nature*) have received the following circular from the U.S. Naval Observatory, Georgetown Heights, Washington, D.C., dated May 17.

"In anticipation of the total eclipse of the sun, May 28, 1900, the United States Navy Department has arranged with the Secretary of the Treasury to have admitted free of duty the instruments of foreign astronomers who may come to this country to observe the eclipse.

"To this end astronomers abroad who contemplate an expedition to



the United States are invited to notify the Superintendent of the Naval Observatory of the probable date of their arrival, with the name of the port at which they propose to disembark. The Navy Department will forward to the consuls of the different countries to which these observers belong, stationed at the ports in the United States at which the gentlemen shall arrive, a letter stating their purpose in travelling, which letter will be countersigned by the consul and presented to the collector at the port as a proof of their identity. Upon this the collector will extend all proper facilities for the speedy delivery of the instruments in question, free of duty and charges.

"The Superintendent of the Observatory will be glad to hear from each of the proposed expeditions, in order that he may render such assistance as lies in his power. The path of totality extends through a thickly settled portion of the country, including some principal cities. Facilities for transportation are excellent, but it is recommended that instruments be securely packed and marked 'delicate instruments—handle with care.' The climate at that season is warm. The chances for clear weather are good.

"Full information regarding routes of travel to proposed points, and other particulars, can best be obtained through consuls. Through the regular diplomatic channels notice should be conveyed to the local authorities of the city or town selected as a post of observation.

"This Observatory will issue a pamphlet of instructions, containing large scale maps showing path of totality. "C. H. DAVIS,  
"Captain, U.S.N., Superintendent."

## Our Editorial Table.

### "AGFA."

Sole Wholesale Agents, A. & M. Zimmermann, 9 and 10, St. Mary-at-Hill.

"AGFA" is a clear, colourless, one solution intensifier, stated to keep indefinitely, and merely requiring dilution for use. It immediately darkens the deposit, and in about three minutes intensification is complete, the plate being then washed from ten to fifteen minutes. Its other features are: It is not necessary to blacken the negative in a secondary solution, because there is no bleaching of the image; it does not produce a non-permanent stain; it is easy to judge when the necessary intensification is arrived at; the gradual building up of the image is plainly visible. AGFA produces an intensification free from grain.

### PLATONA (ILFORD PLATINUM PAPER).

Manufactured by the Britannia Works Company, Ilford, E.

We append the full instructions for Platona paper, a sample of which we received this week for trial:—

**Printing.**—Printing frame and pad should be quite dry. Print until all details are faintly visible. Examine in weak light only.

### DEVELOPING FORMULA. (Stock Solution.)

Potassium oxalate .....	2 ozs.
Potassium phosphate .....	1 oz.
Water .....	14 ozs.

If unable to obtain potassium phosphate, the sodium phosphate may be substituted, but the former is preferable. Dissolve the salts in hot water and allow to cool. This solution will keep indefinitely. For use take 1 part stock solution and 1 part water. Develop in weak artificial or diffused light, floating prints face downwards in the solution. The image does not lose in fixing.

### FIXING.

Pure hydrochloric acid .....	1 oz.
Water .....	80 ozs.

Immerse prints for about five minutes each in three consecutive baths and then give them a final washing in water for fifteen minutes.

The prints are then ready to be dried and mounted.

Platona paper must be always kept stored in the tubes in which it is bought, and if so kept will remain in good condition. The cap should be kept screwed up, so that the tube is air-tight. Do not screw it up too hard, or it may be difficult to remove.

The paper is sent out in tin tubes with screw tops, which make the receptacles perfectly light-tight and can be used for storage of the paper. In actual working we found the sample sent us yielded excellent results, the formulae employed being those above given. Platona paper is evidently the outcome of great chemical skill and experience, and we should imagine it would successfully appeal to thousands of photographers, who will appreciate it in the cheap and convenient form in which it is presented to them by the Britannia Works Company.

It is very late in the day to discuss the characteristic qualities of a platinum print, no matter by what particular process it is produced. Platinum printing, which twenty odd years ago was caviare to the general, now as well known as the albumen paper process. There is, however,

one feature of it upon which uninterrupted insistence is allowable: we allude to the property of permanence which platinum prints possess. Authorities are in agreement that in the whole range of photo-printing nothing stands a better chance of permanency than a carefully prepared platinum print, and on those grounds the process cannot possibly be robbed of its popularity. Albumen, gelatine, collodion, bromide, may rise or fall in public estimation; but it is doubtful if platinum will experience such fluctuations. Hence the move of the Britannia Works Company in taking up the process is a wise one and should be assured of success.

MESSRS. FUERST BROTHERS, of 17, Philpot-lane, E.C., send us a sample of Messrs. Lumière's new developer, hydramine. The properties of this developer, which is sent out in the form of fine white crystals, are set forth by Messrs. Lumière themselves in an interesting article which appeared in this JOURNAL of May 19 last.

### LIVING PICTURES: THEIR HISTORY, PHOTO-PRODUCTION, AND PRACTICAL WORKING.

By HENRY V. HOPWOOD. 275 pp., 242 illustrations. Price 2s. 6d.

London: Published by the Optician and Photographic Trades Review, 123-5, Fleet-street, E.C.

MR. HOPWOOD'S book on animated photography is, to our thinking, the most complete that has yet taken this fascinating branch of work for its subject. He has set about his task in a very painstaking manner. Opening with a brief study of the phenomena of persistence of vision, he discusses, at great length and by the aid of many illustrations, the illusion of motion produced by successive views of slightly varying diagrams. This chapter will be found of great service as an initiatory study to the main theme. The third chapter, on chrono-photography, takes the reader into a minute historical and theoretical examination of the successive steps which led to the transformation of the kinetoscope into the cinematograph of to-day, and the next section of the book is devoted to a description of the various forms of apparatus on the market at the present time. The practical production of the film negatives and positives is next dealt with. There are hints for exhibiting, a chronological digest of British patents since 1851, when Fox Talbot patented a device for making instantaneous pictures of moving objects, and the book concludes with a useful annotated bibliography. Mr. Hopwood appears to have spent very great care in the preparation of his volume, which, so far as we have been able to test it, is historically accurate; indeed, it is so good, full, and thorough, that it strikes us as deserving of immediately taking rank as the standard text-book of the subject. We must congratulate the author and our esteemed contemporary, the *Optician*, on having enriched the literature of photography with a volume which it is pleasant to read and profitable to study.

### CATALOGUES RECEIVED.

Marlow Brothers, 23-30, Constitution-hill, Birmingham.

BESIDES the "M. B." specialties in hand and stand cameras this catalogue, which extends to about 150 pages and has nearly 200 illustrations, deals with a large general stock of photographic apparatus and material. It is well printed and produced, and is sent to applicants for twopenny.

Levi, Jones, & Co., 29, Hoxton-square, N.

THIS catalogue, which has some 140 pages and scores of illustrations, is divided into sections, hand cameras occupying one; studio cameras, lenses, &c., another, and so on right through the field of photographic manufactures. The catalogue appeals to the trade, who should find it useful for reference.

## News and Notes.

MR. W. E. WOODBURY is to edit a projected American magazine, called *Photographic Life*.

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, Tuesday, June 20, at 12 Hanover-square, at eight p.m. "Retouching," by Redmond Barrett.

THE address of Mr. James Bunce, optician and photographic dealer, has been changed from 21, Maitland-street to 93, Shandwick-place, Edinburgh.

MESSRS. BERGER & Co., manufacturers of photographic printing papers, of South Hill Works, Hampstead, London, announce that, in consequence of the increased prices of raw materials, on and after June 19, 1899, they will be compelled to advance the price of Luxia P.O.P. to 15s. per quire.

TECHNICAL EDUCATION.—The Local Government Board auditor recently gave an important decision disallowing School-board expenditure upon science and art education. The point arose through representatives of the London County Council taking exception to certain items of expenditure by the London School Board in technical or secondary education upon such lines as to compete injuriously with similar work in the Council's polytechnics and institutes in the same districts. The official auditor has now ruled that such expenditure by the School Board is illegal, and can only be carried through as financial aid from the County Council.



**SOUTH LONDON PHOTOGRAPHIC SOCIETY.**—Continental Excursion Belgium, August 19 to 27.—Two leaders of this excursion are Messrs. William F. Slater and Walter D. Welford. Headquarters are at Brussels, and the fare, saloon, about 25s. Full programme will be issued in a week or so. Visitors will be welcome.

**PHOTOGRAPHIC CLUB.**—June 21, at eight o'clock, "Binocular Vision and the Stereoscope," by Mr. Thomas Badding. Visitors are admitted to the meetings of the Club on the personal introduction of a member, or by invitation cards, which the Hon. Secretary, Mr. W. R. Stretton, 4, Queen-street-place, E.C., will be pleased to forward on application.

It is with much pleasure that we note that, owing to the increase of business, Messrs. Newton, of Fleet street, have found it necessary to open fresh workshops, so they have taken a factory in Little James street, W.C., where they will manufacture their well-known induction coils and scientific instruments. The optical lanterns will continue to be made in the Fleet-street workshops, and the lantern slides at their works in Dalston and Islington.

A SUIT for 10,000 dollars damages has lately been decided against the old City of Brooklyn, on the ground that the city was responsible for the existence of a large show-case filled with photographers' exhibits, which fell from the second story of a building and caused serious injury to the plaintiff. The original suit was for 30,000 dollars, and was decided in favour of the city, but, on appeal, a new trial was ordered, which resulted in a verdict against the city for 10,000 dollars.

**STUDIO BOGEYS.**—At the annual meeting of the Royal Architectural Museum and Westminster School of Art last week Sir Wyke Bayliss warned the students against the bogeys which, he declared, haunted the studio. In the first place, there was the bogey of the commonplace, and he urged artists to remember that they should get more into their pictures than they could find in their paint boxes. All art worthy of the name began in paint and ended in passion. The artist should be not only a seer, but a revealer. Another bogey would fain persuade a man that he was an artist because he knew something about technique or had an appreciative mind for the beautiful. A third bogey harped on the word "pot-boiler," till many an artist lost interest in his work because he had come to regard it as purely commercial. There was nothing degrading about painting a picture for money, and most of the finest work in the world had been done with a keen eye to the financial result. In conclusion Sir Wyke urged that "the greatest bogey of all" was the one which persuaded the artist that "the golden age" of art had passed away, never to return.

**EMBEZZLEMENT.**—In the Edinburgh Police Court, before Sir James Russell, George Forbes, thirty-three, canvasser, 176, Causewayside, pleaded guilty to a charge of having, between the April 26 and May 16, stolen 4l. 12s. 6d. from Wood & Co., photographers, Princess street, Edinburgh. The prosecutor said that Forbes was employed by Wood & Co. to collect accounts and to get orders, on which he was paid commission. He sent a certain number of orders, which were afterwards found to have had no existence, and for which he got commission. He also collected over 3l., which was not handed over to Messrs. Wood. Mr. D. Murray, solicitor, said Forbes had been for some years in the employment of the firm. He was sent to open up a new district about West Calder, but, not being very successful, he became despondent and gave way to temptation. His employers had consented to take him back. The magistrate said this was a deliberate fraud by a confidential servant; but, as there was nothing against him previously, and as his employers were willing to take him back, he would give him the benefit of the First Offenders' Act, and put him under 5l. caution for two years.

MR. AND MRS. MONTAGUE COOPER were engaged to attend a *conversazione* held at Wellington College, Berks, on Saturday evening last, given by the Natural Science Department of that Institution. Mr. Cooper demonstrated to a large number of pupils and friends the value of the new printing papers, Velox, Gravura, and Dekko, which have lately been introduced, and are a great boon to amateur as well as professional photographers. By means of either of these papers prints can be exposed, developed, and finished in artificial or weak daylight without the necessity of a dark room, and a great many photographs can be thus obtained in a very short space of time, and also a choice of tones varying from red chalk, sepia, brown, and purple to black. Most successful results were obtained in all these colours. Mrs. Cooper was the centre of a crowded group during the whole evening, who watched with marked interest her skill in finishing photographs in water colours by means of a very clever instrument called the aerograph. This enables an artist, in an incredibly short time, to do what, with the ordinary artists' brushes, would take hours or even days to produce. Colours can be superimposed and very much softer and more even results obtained than with the brush. Altogether a very instructive and pleasant evening was passed, and at the close Mr. and Mrs. Cooper were warmly thanked for their attendance, and congratulated on the exhibition given.—*Somerset County Gazette*.

## Patent News.

The following applications for Patents were made between May 29 and June 2, 1899:—

**LOCKING ATTACHMENTS.**—No. 11,254. "Improvements in Locking Attachments for Photographic Apparatus." Complete specification. E. G. GOODSELL and W. B. HASKINS.

**REPRODUCTION PROCESSES.**—No. 11,255. "Improvements relating to Photoreproduction Processes and to Apparatus therefor." J. T. BENTLEY.

**COLOUR PHOTOGRAPHY.**—No. 11,466. "Improvements in the Method of and Means for Rendering Photographic and other Pictures of Objects Visible in their Natural or in other Colours." T. THORP.

**FOLDING CAMERAS.**—No. 11,472. "Improvements in Folding Cameras." J. E. THORNTON.

**CAMERAS.**—No. 11,475. "Improvements relating to Photographic Cameras." R. DRURY.

**PHOTO-PRINTING.**—No. 11,547. "Improvements in and relating to the Photo-printing of Drawings." Complete specification. A. SCHWARZ.

**CINEMATOPHONES.**—No. 11,550. "Improvements in Cinematophones and in the Production of Photographs therefor." Communicated by G. Bagrachow. W. P. THOMPSON.

**LIGHTING APPARATUS.**—No. 11,553. "Intense Lighting Apparatus for Instantaneous Photography, called a Relampago Guimaraes." Complete specification. J. F. GUIMARAES.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
19.....	South London .....	Exposure and Development. R. Child Bailey.
20.....	Gospel Oak .....	Toning Competition.
20.....	Hackney .....	A Few Remarks to Beginners. W. L. Barker.
20.....	Royal Photographic Society .....	Retouching. Redmond Barrett.
21.....	Photographic Club .....	Binocular Vision and the Stereoscope. Thomas Beddix.
22.....	London and Provincial .....	Open Night.—Nomination of Officers, Committee.
24.....	Croydon Microscopical .....	Excursion: Charlton. Leader, Dr. Parsons.
24.....	Hackney .....	Excursion: Mucking. Leader, W. Selfe.
24-26.....	Liverpool Amateur .....	Excursion: Windermere. Leader, Dr. Llew. Morgan.
24.....	Oldham .....	Excursion: Miller's Dale. Leader, Jas. Hall.
24.....	South London .....	Excursion: Theydon Bois. Leader, G. J. T. Walford.

### ROYAL PHOTOGRAPHIC SOCIETY.

JUNE 13.—Ordinary Meeting.—The Right Hon. the Earl of Crawford, K.T., F.R.S. (President), in the chair.

#### NEW MEMBERS AND FELLOWS, &c.

Seven new members were elected, four candidates were nominated, and three members were admitted as Fellows. The result of the election of Judges for the forthcoming Exhibition, as stated in our last issue, was formally announced.

#### ACETYLENE.

Professor VIVIAN B. LEWES read a paper on "Acetylene." Dealing first with the history of acetylene gas, he said that in 1836 Edmund Davy, nephew of Sir Humphry Davy, read a paper before the Dublin Royal Society, in which he stated that, in the course of some experiments in which he distilled tartaric acid, he obtained a residue which, when thrown into water, evolved a gas, that gas proving on analysis to be bicarbonate of hydrogen, and he went on to point out its properties, and concluded his paper by showing the marvellous illuminating power of the gas, and prognosticating that it would some day play a very important part in connexion with lighting. On reading Davy's paper, it was evident that very little advance had really been made since its date with regard to acetylene, and the facts which he put forward formed as good an epitome of the characteristics and properties of acetylene as could be compiled to-day. After Davy's time, many experiments were made, and in 1859 Berthelot commenced some researches which led to the discovery, in 1862, that acetylene could be built up from its constituents. This was followed by the discovery by Wohler, a great German chemist, that calcium carbide could be made in the electric furnace, and that it was decomposed by water with the evolution of acetylene gas. It was not, however, until 1892 that these experiments were put upon a commercial basis, when a Canadian experimentalist, named Wilson, found, quite by chance, that calcic carbide could be made directly from lime and charcoal in the electric furnace, the same result being arrived at a few months later by a celebrated French scientist as a step in some of the most beautiful researches ever made. At that time the amount of electricity necessary to make a pound of carbide was very high, but subsequent improvements had rendered it possible to make one ton per year with one electrical horse power. Professor Lewes next described the ingot process of making calcic carbide, in use in England and America, and the running process by which arrangements are now being made for the production of about 30,000 tons per annum on the Continent. He remarked that many people thought that if the carbide had a very fine crystalline surface it was perfectly pure, and that if it appeared like grey pig-iron it was impure, but he said that these differences were entirely dependent upon the manner in which it was cooled, and that the latter was often more satisfactory in use than the former. With regard to the precautions necessary in the storage of carbide, and which were sometimes thought to be vexatious, he said they were not unnecessary, and that in almost every country in the world where they were not insisted upon the history of acetylene had been marked by a considerable number of accidents. Turning to the subject of generators, the lecturer first showed the method which he described before the Society of Arts in 1895, the calcic carbide being placed in a perforated zinc cage and plunged into a cylinder filled with water, and the resulting gas being received in a floating bell; and he then classified and described the other methods which have been adopted for the generation of the gas, laying particular stress upon the importance of obviating undue heating in the generator as essential to the avoidance of danger. The following method



was given for ascertaining whether a generator was satisfactory: Put a small piece of carbide into water, and examine the residue; if the residue is white, or nearly white, the carbide is of good quality; then use some of the same carbide in the generator, and if, after the generation of acetylene is finished, the residual lime is white, there is no fault to find with the generator; but, if the residue is snuff-coloured, the temperature evolved by the decomposition of the calcic carbide was too high, and the generator is not a good one. After discussing the various forms of burners suitable for acetylene gas, the Professor alluded to its richness in actinic properties and its consequent value for photographic purposes, and said its cost would compare most favourably with that of other methods of artificial lighting, both for studio work and for printing purposes. He concluded by performing a pretty experiment to show that, when a light is applied to acetylene, it burns with a luminous and intensely smoky flame, and that, when a mixture of one volume of acetylene with one volume of air is ignited in a cylinder, a dull red flame runs down the cylinder, leaving behind a mass of soot, and throwing out a dense black smoke.

A discussion ensued, in which Messrs. CHAPMAN JONES, KROHNE, BOLAS, SPILLER, VEZEY, Sir H. T. WOOD, and the CHAIRMAN took part, and Mr. CLIFTON said he had found acetylene very useful both for projection purposes and in enlarging. It appeared, from the remarks of several speakers, that it was regarded as very necessary that the greatest care should be observed in generating and using the gas, but that, if due care was taken, no danger was to be apprehended from explosion or other causes.

#### COMING EVENTS.

Technical Meeting, June 20, a paper on "Retouching," by Mr. Raymond Barrett. After June 24 the Society's address will be 66, Russell-square, W.C., and on June 27 the President and Council will receive the members of the Society and of affiliated societies thereat, when it is hoped that as many as possible will take the opportunity of inspecting the spacious accommodation afforded by the new premises.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 8.—Mr. H. C. Rapson in the chair.

Mr. J. E. HODD showed an adaptation of the old plate-lifter or holder to present requirements in the shape of a celluloid dish with a plate-lifter combined. The device for raising the plate from the solution, without the necessity of bringing the fingers into contact with the developer, like the dish, was made of celluloid, and was freely, but securely, attached to the edge of the dish. It was also useful for maintaining a flow of solution over the plate, effected by alternately raising and lowering the plate on the lifter.

Mr. A. L. HENDERSON remarked that he had at one time tried to induce certain firms working in celluloid to put upon a market a series of graduated celluloid measures and other photographic accessories, but was disappointed at the lack of enterprise which he found. While British makers were practically stipulating for a good market, he saw Continental firms with commendable energy creating and absorbing the demand to themselves.

#### TONING BATHS.

Mr. Henderson passed round a print, of which the whites were perfectly pure, and the tone a purple one, to him very agreeable, yet there was not a particle of gold in the toning bath. He had been experimenting with various compositions in this end, and had arrived at a certain prescription, which he believed might be put upon the market in the form of a compound which required only dissolving in water to yield a combined toning and fixing bath, to which, while it might be added, gold was not a necessity. He found that it was as well to print a little farther than usual, on account of the greater tendency of the bath to bleach the print than was present with the methods now in vogue. Without specifying the ingredients and proportions altogether, he would say that the mixture included formates, lead and hypo in a certain combination. He was at present ascertaining whether the action of the hypo was impaired by its mixture with the other bodies, and proposed to test the fixing power of the bath upon bromide plates as against a pure hypo bath.

Mr. J. E. HODD said that, in his own practice, he invariably over-printed to that trifling degree which gave a slight veil over the whites, an extent which was hardly to be considered as over-printing at all. He did not find that anything but this slight veil was lost in the toning and fixing operations. As regards toning without gold, he had failed to detect any action in the case of the phosphate bath except in the presence of gold. Some papers, too, he added, refused to tone with phosphate altogether.

Mr. P. EVERITT believed that Dr. Just had asserted that a trace of copper in the toning bath was advantageous.

#### DEVELOPERS—MODERN versus OLD.

Mr. WALTER D. WELFORD opened a discussion upon the question of modern versus old developers by referring to the developer, pyro ammonia, which was taken as the standard in a paper to which he had recently listened. While admitting himself to be a pyro man, there were, at the same time, a few statements in this paper to which he took exception, and this, he thought, might be appropriately done in a discussion like the present. The author of the paper endeavoured to prove that pyro ammonia would do anything and everything that any of the modern developers would do, but in this he was not altogether in accord.

Modern developers, or some of them, had a different action to pyro in respect of prolonged development. Prolonged development with pyro resulted in an intense building up of density on the high lights out of proportion to the shadows. Metol, amidol, and other of the modern developers did not do so, but tended to a more proportionate action, so that a print from such a negative would show a truer scale of gradation than a pyro negative with this prolonged development. There was consequently something to be said in favour of the modern developer and against pyro in this respect. As regards the power with pyro and ammonia of altering the developing solution, any one who had used the developer at all would know that a very little additional ammonia introduced fog very rapidly. Not so with the modern developer. The amount of accelerator could be much increased without risk of fogging

the plate. In conclusion, Mr. Welford thought that modern developers undoubtedly gave one or two advantages in certain directions over pyro.

Mr. A. MACKIE asked whether, in asserting that a small increase of the ammonia with pyro gave fog, whereas with modern developers the accelerator could be largely increased without, the last speaker was referring to the carbonates of the alkalis in the latter case.

Mr. WELFORD replied that he did, the carbonates being generally employed.

Mr. MACKIE said that, if Mr. Welford had increased with the ammonia the restrainer, he would have found that a sound plate would stand a considerable amount of ammonia.

Mr. EVERITT thought that, in a comparison such as this, similar alkalies should have been used.

Mr. WELFORD said he used pyro soda himself, but took for comparison the pyro-ammonia standard in the paper to which he referred at the commencement.

Mr. MACKIE said in the old days the bromide and the ammonia were mixed together, and one could use an enormous quantity of it.

Mr. FRESHWATER kept the bromide with the ammonia when he used the pyro-ammonia developer. This was his favourite developer, but the difficulty of keeping the ammonia in condition had induced him to use the pyro-soda formula of late. He had found no great obstacle to the increase of the ammonia on occasion, and did not get green fog as a result.

Mr. WELFORD asked whether anybody believed it possible to get out of an under-exposed plate with pyro ammonia as much detail as with one of the modern developers? Could one use as much of the accelerator with the pyro to push development as with the new reducing agents? He thought not, and in extreme cases would discard ammonia.

Mr. MACKIE held that much depended upon the plate. Some would stand a lot of ammonia safely. At the present day, however, he thought that in such cases he should use metol or amidol instead of pyro.

Mr. J. E. HODD agreed that one could not overdo the density with the modern developer easily. They went to a certain extent, after which, though one piled on the alkali to an alarming extent, there was really little difference. As a standard developer, he liked the pyro-potash developer; but, if he had any suspicion of under-exposure, he should fall back upon pyro metol. He was of opinion that ammonia was now so little recommended by makers on account of the high speeds to which plates had been pushed.

Mr. EVERITT held the question of what a developer would do largely a matter of preference, and what one did with it. The ultimate result was little different. For an under-exposed plate he usually took fresh pyro, bromide and ammonia, using warm water, which he thought was a matter of importance. The results by this were as good as anything to be done by the new developers.

There was a long discussion, in which several interesting points were touched upon in addition to those we have enumerated.

Gospel Oak Photographic Society.—May 6.—Mr. S. D. McKELLEN, of Messrs. McKellen, Limited, of Manchester, attended to explain the capabilities of the

#### CATHEDRAL HAND CAMERA.

Mr. McKellen said that a need had been felt for a magazine hand camera of sound construction, which should be very easy and certain in its action, which should be constructed of reliable materials, and which should be offered to the public at a price well under 5*l*. That this want was a real one he knew by experience, for it had often been said to him, when explaining the Infalible hand camera, which was made by his firm, and which he had brought before the members of the Gospel Oak Society on a previous occasion—it had often been said to him, "Yes, it's a very nice article, but the price is too high. Cannot you give us something, equally reliable, which will leave us some change out of a 5*l*. note?" As a reply to this query, his sons had invented, and his firm had manufactured and placed upon the market, the Cathedral hand camera. This camera was one which he could recommend to any one who wanted a magazine hand camera with a really reliable changing mechanism. As this camera has not been on the market a very considerable time, details as to its construction may not be devoid of interest to the readers of this JOURNAL. The body of the camera consists of two boxes, one sliding within the other. These are pulled apart as far as they will go, steadily, and without jerking, and then closed up again. This movement has taken the exposed plate which was nearest the lens, and carried it to the back, leaving plate No. 2 in position for exposure. This, with the exception of setting and releasing the shutter, are all the movements necessary for taking a photograph. The changing mechanism, which is extremely simple, is rather difficult to describe. The plates are held in sheaths, each of which has a small steel rod or wire fastened to the top, and projecting perhaps a quarter of an inch on each side. These are numbered from 1 to 12 on the back, and the body of the camera having been pulled apart and closed again as many times as may be necessary until the indicator shows the No. 12, the door at the back of the camera is opened, and the sheaths, which have been filled with plates, are placed inside in their proper order. The camera is now opened and closed, the figure 1 appears on the indicator, and the first plate is ready for exposure. What has happened is this: The pack of sheaths was fed from the back into the inner body, and the movement of pulling the camera apart and closing it again has brought into action a lever in the inner body, and this lever has raised the front sheath until the pins at the top are in a position to be engaged in two hooks which are affixed to the inside of the outer body, which is the correct position for exposure. The exposure of No. 1 having been made, one proceeds to make ready No. 2. On catching hold of the front of the camera, a catch is felt at the bottom. If this be pressed, the two bodies are disengaged, and can be pulled apart a certain distance. On this being done, the hooks which are attached to the inside of the outer body first lay hold of the pins, and, on continuing to pull the bodies further apart, the sheath, still held by the hooks, is carried over the top of the remaining sheaths, and left swinging at the rear. The camera now being closed, the sheath is disengaged from the



hooks, and has taken the position previously occupied by No. 12, the hooks travelling forward until they resume their position, ready to engage the pins of No. 2 sheath, as described in the case of sheath No. 1. By this means it is possible to expose any given plate of the series. We will suppose that sheaths Nos. 1 and 2 carry exposed plates, that No. 3 is in position ready for exposure, but that it is desired to use a special plate, which our note-book tells us is carried in sheath No. 9. All that is necessary is to change (without exposing, of course) the sheaths numbered 3, 4, 5, 6, 7, and 8, by pulling the bodies apart and closing them again in the manner above described, until the indicator shows that No. 9 is in position. After exposure, the fact that No. 9 is exposed is recorded in the note-book, and the changing operation is continued until No. 3 is again in front of the lens, and, when No. 9 is reached again, it is passed over, and No. 10 brought to the front. By this simple means it is possible to load the camera with an assortment of plates, any one of which may be used without the necessity of waiting until those in front of it have been exposed, as is customary with a magazine hand camera of the ordinary type. When the camera is drawn apart for the purpose of changing the plate, two hooks at the side of the inner body spring out and prevent the other sheaths from being disturbed, but these hooks are automatically moved away, leaving the sheath which has been brought from the front to be pressed close against its fellows by a spring attached to the back door. The hooks are also out of the way when the camera is closed, so that they do not prevent the sheaths being fed into the back when it is necessary to reload the camera. The Cathedral is made in two qualities—A, fitted with a snap-shot roller-blind shutter, and B, which is fitted with a new roller-blind shutter, which has some novel points. First, as to price, it is cheaper than most others on the market. Second, in addition to the familiar movement for giving ordinary time exposure, by means of which the shutter remains open so long as the pressure on the ball is maintained, there is in this new shutter also a third notch, and, the lever being moved over to this and the shutter shut, a slight pressure on the ball opens the shutter, which remains open until the ball is again pressed. Thus for long exposures it is not necessary to keep the ball deflated the whole time. The camera is provided with two accurately set ground-glass finders, bushes for affixing to a tripod for time exposures, of which a very excellent pattern was shown by Mr. McKellen, made by his firm, and a first-class rapid rectilinear lens of about average focal length. Focussing is done by means of a small lever projecting just below the lens aperture, and moving over a scale, the accuracy of which may be depended upon. If desired, the camera may be fitted with the McKellen-Heywood finder, which has previously been described.

**Edinburgh Photographic Society.**—At the Annual Meeting of the Edinburgh Photographic Society, held in the rooms, 38, Castle-street, Mr. A. Eddington (the President) in moving the adoption of the report, stated that the Society had had a most successful season. The membership had been increased from 456 to 500, which was the largest membership the Society had yet had, while the surplus of assets over liabilities had been increased by a sum of no less than over 113l. That, he considered, showed a rate of progress of which the Society had every reason to be proud. The following elections then took place:—*Hon. Presidents:* Messrs. H. J. Blanc, R.S.A., J. C. Oliphant, M.A., and John Stewart Smith.—*President:* Mr. A. Eddington.—*Vice Presidents:* Mr. James Hay and Dr. Scott Lauder, R.N.—*Treasurer:* Mr. George Cleland.—*Curator:* Mr. John Anderson.—*Secretary:* Mr. J. S. McCulloch, W.S. Mr. J. B. Johnston was elected to a seat on the Council, and Messrs. James Aytton, S.S.C., and D. N. Cotton, C.A., were elected auditors. Votes of thanks to the Council and auditors for their services during the year were accorded.

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPH REGISTERED:—

A. Whittaker, Birchwood, 313a, Norwood-road, Herne Hill, S.E.—Photograph of Cinder Hill Colliery, Nottingham.

DENTROSE; REX, AND OTHERS.—In our next.

P. R. S.—Many thanks.

R. A. BEEMAN.—We do not recollect seeing mention of the idea, which is quite feasible. You would require a very long exposure.

COLLOTYPE.—T. O'CONNOR. The fumes from a paraffin stove will not be harmful in the drying box for collotype plates. Those from gas would be detrimental.

J. R. (Scarborough).—Many thanks for your letter. We must adhere to our opinion, which was founded on long experience. The specimens you sent were all good, and some were exceedingly fine.

LIGHT FOR STUDIO; EAST LIGHT.—An east light is not quite so convenient to work as a north-east or a north light, but equally as good portraits can be done in an east light. If the premises are eligible, from a business point of view, we should say close with the opportunity. See leading article in next week's issue.

**BACKING PLATES.**—S. L. Had you applied the backing according to the instructions issued with it, you would have experienced no trouble. Applied as you have done it, and with your modification of the material itself, we are not at all surprised at the result.

**METHYLATED SPIRIT.**—VICTOR W. Methylated spirit can still be had without the addition of mineral spirit, such as used to be easily obtainable, but you will have to get a licence from the excise authorities, easily obtainable, and then purchase in quantities of not less than five gallons. No charge is made for the licence.

**CHRISTIAN** asks: "What is the English law with regard to the closing of shops and business houses on Sunday, and how does it affect a photographic business?"—In reply: We believe an Act of Charles the Second can be set in force against the photographer trading on Sunday; but we do not think any magistrate would convict.

**WAXING SOLUTION FOR CARBON PRINTING.**—S. BIGOOD writes: "I have made a solution of wax and resin, as given in the ALMANAC for flexible support, but the whole of the wax does not dissolve, and the solution is turbid. Is that as it should be?"—Yes. Bees'-wax and turpentine do not form a clear solution, but the turbidity may be disregarded if pure bees'-wax be used. Rub the solution well on with the flannel and then polish with another piece, and all will go well.

**TAX ON VEHICLE.**—TRAP says: "I have a horse and trap which I have to have specially for business purposes, and I cannot do without them. Occasionally, on a Sunday, I take a drive out with my family, and now I am taxed for the thing. I have explained to the tax-collector that I must have the trap—a small wagonette—for the business, but he says that, as it is used for pleasure purposes, I must pay."—Yes, we surmise you must, inasmuch as the horse and vehicle are not used exclusively for business purposes.

**PHOTOGRAPHURE. SIGMA.**—We are quite familiar with the photographure named and there is, as you say, a considerable amount of hand work upon it. We have never heard that the firm who used it profess that any of their plates are untouched by hand, or indeed that any of the foreign houses, or English ones, that issue photographures profess that their plates are free from hand work. Some plates require more work than others, and the producers put as much upon them as they think necessary to obtain a successful result; the end justifies the means.

**FADING PRINT.**—W. W. H. writes: "By a separate post I send you a couple of 12 x 10 unmounted prints that were, with a number of others, printed for me by a trade firm less than two years ago, all of which have turned yellow like those. The firm say they cannot guarantee permanent prints, as all silver prints fade, and these were all right when they left their hands. But surely prints should not get in this state in so short a time. Yet the firm repudiate all responsibility in the matter. Have I no remedy?"—We cannot say. Less than two years for the prints to become in the state these are seems a very short time. The remedy, if any, is in the County Court. The prints are returned as desired.

**DEVELOPING FERROTYPE PLATES.**—FERROTYPE says: "I have been using some dry ferrotype plates for outdoor portraits, and find when I am developing that a scum comes up all over the plate, whether under or over-exposed, and which I can remove by applying tongue to it, but as it sometimes scratches the plate, owing to the film being wet, and not at all a pleasant practice, I should be pleased if you could tell me of a preventative or cure chemical, or otherwise?"—We should surmise that the scum is caused by some impurity in the developer. Personally we have had but little practical experience with ferrotype dry plates, therefore we suggest that you write to the maker of those you are using; he no doubt will tell you a remedy.

**OBSTRUCTING LIGHT.**—H. A. H. writes: "My studio is built out from the back of the house, and is for the most part a brick and glass structure. It was put up in 1874, and now the owner of the house next door, who has only had the place a year or two, is building a high warehouse, which will stop off all my light on one side of the studio. I have protested to him, but he says he can put up anything he likes on his own premises; but can he do so if he stops off my light?"—He can put up anything he likes on his premises, but not if he obstructs your "ancient lights." If the studio was built in 1874 it enjoys "ancient lights," and you can obtain an injunction to restrain his obstructing them—and lose no time in obtaining it.

**QUICK LENS WANTED.**—F. STONE says: "I want, if possible, to get a very rapid lens—more rapid than any of the f-5.6's. I only want to cover a plate about two inches square, but I want the image perfectly sharp, so that it can be enlarged several diameters. The pictures I want specially will have to be taken where the light is not by any means good. Can you advise me?"—The most rapid lens is what is known as the "baby lens." It is of the Petzval form, and has an aperture of about f-3; but, of course, at that aperture it has but little "depth of focus." What we should think would best suit would be one of the old rapid stereo lenses. They would cover the size well, and have an aperture of about f-4, consequently they are of double the rapidity of the f-5.6 lenses.

**RESIDUES.**—E. KRAUSE says: "I have got eighty-five ounces of silver dust which I should like to melt down in a crucible, but I do not know how to proceed. Could you kindly advise me how to do it?"—By "silver dust" we presume ordinary residue in the state of powder is meant. If so, mix the residue with an equal weight of a mixture, in equal parts, of carbonate of potash and carbonate of soda. Fill a "skittle pot," crucible about three-fourths full with the mixture, and put into the melting furnace. Apply the heat gently at first, and, after the contents of the crucible have been boiling some time, make up the fire, and increase the heat till the contents of the pot acquires a somewhat quiescent appearance; then remove. Unless you have a properly constructed furnace, you will do better to send the residues to a refiner.



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## EX CATHEDRA

ON Monday last, the Select Committee of the House of Lords on the Copyright Bills now before the House met under the Chairmanship of Lord Monkswell. Amongst the witnesses was Mr. Gerald Robinson, President of the Society of Mezzotint Engravers, who stated that his Society was opposed to the principle of the Bill altogether, because it deprived the engraver of any status, by putting him on a level with the process-worker. He insisted that the three branches of work, engraving, process, and photography, should be treated separately, and that engravings should come under the head of original works of art, and be given a longer period of copyright, and that it should be a penal offence to pass off process work as engraving. Another witness, Mr. Edward Cutler, Q.C., after pointing out some curious anomalies in the Bill, as regards the qualification of locality, remarked that the tendency of legislation on the subject of artistic copyright seemed to make a dead set against photographers, which was unjust and unreasonable, especially considering the great progress that had been made in photography in late years.

MR. CUTLER'S valuable evidence was supplemented by that of Mr. Bulmer Howell, solicitor of the Photographic Copyright Union, who said that the proposed Bill differed in many respects from Lord Herschell's Bill of last year, and that every difference was detrimental to photography. In Lord Herschell's Bill all artistic works were placed on the same level, but the present Bill would draw a distinction between the various classes of works. Thus photographs were, in regard to copyright, to be degraded below some forms of process reproduction, which were only rendered possible by means of photography. Again, to put photographers under the obligation of registering would be, in Mr. Howell's opinion, a hardship involving much trouble and expense.

\* \* \*

IT will be seen by a letter in our Correspondence columns that the Royal Photographic Society convened a meeting for Wednesday night last, with the object of getting up a protest against the intention of the Bill to remove photography from classification among the fine arts. In our article on the subject last week we pointed out that the present time could hardly be regarded as opportune for altering the classification, seeing that, after a lapse of thirty-seven years, the claim of photography to be considered a fine art for legislative purposes was considerably stronger than at the date when the existing Act was passed. The agitation against the Bill as it affects the interests of photography and photographers is growing so strong that we may hope it will have the effect of inducing the Lords to modify the measure in the directions which we indicated last week. On at least half a dozen occasions in the past two months we have touched upon the various obnoxious clauses of the Bill, so that it is not necessary for us again to bring them to the notice of our readers.

\* \* \*

THE new "dry" stripping film of Messrs. Wellington & Ward, of Elstree, is, we are informed, ready for introduction, but some delay must necessarily elapse before it reaches the hands of photographers. It seems that, in what to outsiders may appear as the comparatively small matter of the spool, an unlooked-for difficulty has been met with, namely, that of its manufacture. Such a simple-looking piece of apparatus as a spool might not look to outsiders as hard to obtain quickly



and in large quantities, but this, however, is the fact, and Messrs. Wellington & Ward are therefore obliged to wait until they have an accumulation of several thousands of these spools before they can issue their stripping film in order to cope with the large demand that is waiting to be satisfied.

\* \* \*

MR. E. SENIOR, the teacher of photography at the Birkbeck Institution and the Battersea Polytechnic, is so far the only English experimentalist who has succeeded in producing good results by the Lippmann interferential process of colour photography. Last year he showed us some very good reproductions of silk ribbons, the colours of which with one or two exceptions were rendered with striking fidelity and vividness. A few days since Mr. Senior laid before us some of his latest results. These were half a dozen photographs of the spectrum which Captain Abney has pronounced difficult to excel. Looked at unbacked and with very slight obliquity, the colour bands are strikingly bright—indeed, we have not seen more beautiful results by the Lippmann process than those which Mr. Senior showed us. It is a pity that there are not amongst us more experimentalists of this kind who will take up a process and work it thoroughly from start to finish with a view of ascertaining its possibilities. We wish Mr. Senior success in any further work he may take up. The fact that he was able to produce half a dozen copies of the spectrum of equal brilliancy is the first evidence we have had that the Lippmann process can be comparatively easily made to yield duplicated results.

\* \* \*

THE Florence International Photographic Exhibition closed recently. We learn that the Invitation Section of British Pictorial Photography excited the greatest admiration of the visitors. To those photographers whose works have been sold cheques have been sent. Promptitude in this respect is not always a characteristic of exhibition executives. We trust this idea of international courtesies in the matter of exhibition photography will not be allowed to die out. It would be a good thing if here at home, from time to time, we could have representative collections of American, German, Italian, and French work for public exhibition. It is true that photographers who go to the Royal Photographic and Salon Exhibitions are able to obtain an idea of what the position of pictorial photography in these countries is likely to be from the few examples that are sent to them; but comparatively large and representative collections have not yet been available for public display here. Besides the few foreign exhibitors with whose names we have become familiar in recent years, there may be many others, equally as skilful, who only need an invitation to let the British public have an opportunity of studying their productions.

\* \* \*

MANY of our readers will be sorry to learn that the retiring President of the Photographic Convention of the United Kingdom, the genial and large-hearted John Stuart, of Glasgow, has been ill with influenza and throat trouble. However, he is recovering, and writes us hopefully of being able to attend the Gloucester meeting and perform the ceremony of introducing his successor, Mr. Crooke. Mr. Stuart has recently been holding public one-man exhibitions of his photographic work at Helensburgh, Dumbarton, and Glasgow, which have been

largely attended by interested visitors. Some of the portrait and architectural work Mr. Stuart has lately produced is of the very highest quality and distinction, and we have no doubt that, in giving the non-photographic public of the "cultured" city of Glasgow an opportunity of studying the very latest phases of camera work, of which Mr. Stuart, with remarkable vigour and self-adaptability, has shown himself master, an agreeable material reward will follow such enterprise.

\* \* \*

ANOTHER old friend of this JOURNAL and large numbers of its readers was, we regret to say, recently taken ill. We allude to the popular and much-respected George Mason, of Glasgow, a past President of the Convention. We gather that some time since Mr. Mason was knocked down by a cab, and that he is still suffering from the effects of the accident. He is at present in his country quarters. We wish him a speedy recovery, and trust that he, too, will be well enough to get to Gloucester. A Convention would not be complete without the cheery presence of George Mason, who has so often been the life and soul of its proceedings, and, we hope, will fulfil a like agreeable office for many years to come.

\* \* \*

At the offices of our Paris contemporary, *Le Figaro*, 26, Rue Druot, M. L. Hanrlau is holding, between June 20 and July 8, an exhibition of photographs on what are described as new platinum and palladium papers which are manipulated without development—that is to say, the images are presumably obtained by printing-out.

\* \* Our leading article this week deals with the subject of "Studio Aspects," and points out that though north light studios may be the best for successful portraiture, yet good results may be obtained in studios having other aspects. This article may be commended to the notice of those who have recently written us on this subject.—The Article by "R.," an initial which conceals the identity of a high optical authority, gives a history of what, for convenience' sake, may be termed the use of the convertible system in photographic lenses. This history should be of interest just now when combinations of lenses giving a variety of foci are being used.—The article by M. Georges Fernau on "Speed Scales" includes a table of plate speeds according to Wynne's and Watkins' principles, and a comparative table of speed numbers between Wynne's and the Hurter & Driffield systems.—Among the other articles in the present number attention may be drawn to that headed "The Autumn Exhibitions." This gives intending exhibitors particulars as to dates, &c., of four important autumn Photographic Exhibitions.

#### STUDIO ASPECTS.

THERE appears to be a growing idea amongst some photographers of the present day that good portraits can only be taken in studios with a direct north light, or, at least, in those having a more or less northward aspect. This idea, we know, has deterred some from taking premises that would have been highly eligible, from a business point of view, simply because a studio could not be erected having this supposed imperative aspect. How this prevailing impression has, during the past few years, gained currency it is difficult to conceive, unless it be that, with the introduction of dry plates, a certain know-



ledge of photography and its simple manipulations are so easily acquired that many have entered its ranks who possess only a superficial acquaintance with the art. Now, as a matter of fact, lighting and posing the sitter are the chief things to be learnt in portrait photography, and knowledge and skill in that direction are what so many seem to lack. Here is an example amongst many that have of late come under our notice.

We remember that, in January last, a correspondent wrote asking advice through the Answers to Correspondents' columns. He said, in effect, that he wished to commence business on his own account, and had been offered premises in a good position, on lease, at a very moderate rental, but he could only get a south light. His actual query was, "Would you advise me, all other conditions being favourable, to refuse the offer on account of the light being south?" Our reply was that very successful portraits could be, and are, taken in studios with a south light, but that such studios are a little more troublesome to work at times than those having other aspects, adding that, if our correspondent was a skilful photographer, there was no reason why the premises, if otherwise suitable, should be rejected on account of the south aspect. A fortnight later we received a letter from another correspondent—see the Answers column of our issue for February 10—in which he says, "I really think you have made a mistake in advising a young man to undertake a studio built with a south light. I don't think it worth the candle to a professional. *An east or west light is quite bad enough to work, and only a professional can realise the fact.*" The part we have italicised, no doubt, amused many experienced photographers at the time.

A few weeks back we answered another correspondent thus: "The only advantage of a studio with a north light is that it is easier to work, and requires less skill on the part of the photographer; but a skilful photographer will get equally as good pictures in a studio with any other aspect," adding that "the results depend upon the artist rather than the aspect of the studio." Since then we have had a protest to this reply from another correspondent, thus confirming the idea, as we have just said which we know is held by some, that only the best results are obtainable in studios with a direct north light.

It is a fact that a studio with a direct north light is easier and more convenient to work, and requires less skill than one with any other aspect, simply because the light is more constant throughout the day, and as a result the blinds need be made but little use of; hence there becomes a monotony in the lighting, all sitters being dealt with very much alike, whether it is the best for them or not. We are now, of course, referring to unskilful workers who yet produce fair results. Next to a direct north light a north-east light is the easiest to work, then a north-west, and there is not much to choose between them. East and west lights are a little more difficult at certain times of the day; but those which require the greatest skill to deal with, owing to the light constantly varying throughout the day, are south-east, south-west, and due south, yet excellent portraits are taken daily in studios having these aspects. These latter, however, have, for the most part, been built, *per force*, because no other aspect was available.

It may, however, be mentioned that Mr. Valentine Blanchard worked for some years in a studio with a due south light, and in it he produced some of his finest work. His studio in Regent-street, for example, was on a corner building, and one side had a south light, and the other an east one. Yet he preferred the south for working, because he found it quicker,

particularly in winter, and that he could get a greater variety of effect than he could in the other. But, then, Mr. Blanchard was a skilful artist. That famous photographer, the late Adam Salomon, after his return to Paris after the Franco-German War, built his new studio with a southern aspect, though he had the choice of other aspects. Speaking to an old photographer on this topic, a few days ago, he told us that, during his thirty years' experience of professional portraiture, he had worked in studios lighted from most points of the compass, but he had never had the luxury of working in one with a northwardly aspect. At this season, when the sun is at about its zenith, it must shine on the studio at one part of the day, whatever its aspect—even if it is due north—unless, indeed, it is shielded by some high, near, adjacent building, or is shaded from the outside by a screen.

The prevailing idea with some seems to be that the background must always be in one fixed position and the camera in another, and in these positions they are used by the majority. The blinds are treated in much the same way by many modern workers in a north-lighted studio. Some years ago we sat for a portrait in a Continental studio. There blinds were not used. The lighting was controlled entirely by screens composed of two or more thicknesses of very open net, of a pale bluish tint, strained on light wooden frames that could be adjusted to any angle, on stands which could be easily moved, like the background, to any part of the room. This system of lighting was vended for a substantial fee in this country a few years ago as the "German system of lighting." The system is a most excellent one—more especially in studios with other than northerly light—but it is obvious that it involves a certain degree of skill and judgment to obtain the best effects and that is not possessed by all who practise photography; but in skilful hands this system is an immense power. Inexperienced workers, however, would probably get on better in the orthodox north-lighted studio and the usual set blinds. It may, in conclusion, be asked, if studios only with northerly lights were essential for the production of the best work, how many there would be in large towns, where space is limited and the exigencies of building acts prevail? Not a quarter, we suspect.

The object of this article is to dispel the idea that northerly lighted studios are imperative to successful portraiture, and to emphasise the fact that the quality of the work is dependent upon the skill of the photographer rather than the aspect of the studio, whatever that may be; also that eligible positions from a business point of view should not be rejected simply because a north light is not available. The aspect of the studio should really be a secondary consideration to the business position.

**Test for the Purity of Soda Carbonate.**—The great popularity of the soda-pyro developer we believe is partly due to the ease with which it is compounded, ordinary washing soda being the commonly selected form of the carbonate chosen. Even in this form it is most desirable to have crystals as pure as possible, and a method of testing as to the presence of the so-called bicarbonate will be useful (we must at the same time urge the desirability of crystals of as pure a form as possible, the purified carbonate of soda being a far preferable form). The test we refer to, devised by Herr Melchior Kubli, depends upon the fact that an aqueous solution of a quinine salt of a certain strength is not precipitated by ordinary (or "normal") carbonate of soda if the latter do not contain more than two per cent. of the bicarbonate (the "sodium hydrogen carbonate"). An aqueous solution of quinine hydrochlorate of 0.4 per cent. strength (about two and a half grains per



ounce) is made and kept away from light. A little of this solution is added to an equal bulk of a six per cent. solution (a little over twenty-six grains per ounce) of the suspected soda salt. The presence of over two per cent. of soda bicarbonate will produce a permanent cloudiness.

**Fluctuations in Prices.**—In a general way, photography has, for a number of years, been singularly free from those changes in prices of staple materials which so often occur to the upsetting of calculations and the disturbance of trade in many businesses. As a rule, any change has been uniformly in a downward direction, the most conspicuous exception having been a great rise in platinum a few years ago—a change that influenced the price of a well-known paper. Silver, the other chief staple, as every one is aware, has been steadily going down, till now its cost is less than half what it was in the memory of photographers still young. But there have lately been symptoms of prices in some direction having touched bottom. Thus, certain glass-manufacturers have met in conclave and announced that, in consequence of the continued rise in the price of labour and of fuel, they will, for the future, charge a higher rate. Then, again, possibly as a corollary to this, we hear of one manufacturer of plates and another of paper having found it necessary to put up the prices of one brand of their manufacture. Still at present photographers have not, in their scale of prices, come so low as to be influenced by the market-price of the materials they make use of, though, in the matter of process-work prices, the margin is perilously close.

**Heating of the Anti-cathode in Röntgen Ray Work.**—This effect is well known to workers with the Crookes tube, and is a very annoying one, as the current has to be stopped when the heating is excessive, as otherwise the platinum may become detached from its place. To avoid this heating, Mr. J. Macintyre, in a letter to *Nature*, describes the plan he has adopted to prevent the occurrence, the method being the outcome of many experimental trials. He writes: "It occurred to me that, if we could get a piece of platinum fused into the glass itself, to act as the anti-cathode, and placed opposite the cathode, this object might be attained. Such a tube, after many attempts, has at last been made, and, although the first experiments have only been successful in making small tubes, others of a larger size are at present being attempted. The advantage of this method will easily be seen, because the heating of the piece of platinum can be prevented by placing the whole tube in a cooling mixture or otherwise. These tubes are difficult to make at present, but I possess one which has retained its vacuum for some weeks."

**Solubility of Lime.**—Lime water, i.e., a solution of lime in water, has been suggested as the alkaline agent for some of the more modern developers, and we know that lithia, another metallic oxide, has most valuable properties for the same purpose. But the former oxide is but very slightly soluble, as will be seen from the following list, showing its solubility at various temperatures:—

Temperatures ..... 15° .. 20° .. 25° .. 30° .. 35° .. 40°

Parts of water needed

for one of lime.... 776 .. 813 .. 848 .. 885 .. 924 .. 960

It will thus be seen that the maximum amount of lime dissolved is a little under half a grain to the ounce. It will be noticed that the higher the temperature the less that goes into solution.

**A Big Balloon.**—We are promised, of course from the other side of the Atlantic, a big thing in aeronautics, balloons, about half the length of the *Great Eastern*, one time the largest ship afloat. These new balloons are to be run by the Aerial Navigation Company, of San Francisco, and, according to a telegram from Dalziel's Agency, this Company advertises that it will convey passengers from America to the Paris Exhibition in thirty hours. The number of the balloons in building is stated to be three, and they must be of a remarkably accommodating character to go half round the world and

arrive at the exact spot required. No doubt they will be well provided with cameras, &c., and very probably will have dark rooms attached. There may be a little difficulty about a sufficiency of washing water for the purpose, though possibly water ballast may be used in lieu of sand. By the bye, we believe that Herr André has not yet returned with his balloon and baggage, which was well provided with photographic impedimenta!

**More Disappearing London.**—*Appropos* of the London County Council and its work, it may be mentioned that, if its scheme for a new thoroughfare from the Strand to Holborn be carried out, it will involve the destruction of most of the houses of historical interest in Lincoln's Inn-fields, made famous by Dickens. If the L.C.C. have their way, in face of the opposition to it, the west side of Lincoln's Inn-fields will disappear, for the whole of the houses on that side are scheduled in the scheme. However, there is great opposition to the project at present. The whole of this immediate region and Clare Market has been termed "Dickens's Land," but slowly and surely it is disappearing under this improvement body, and, even now, there is not much left. Lincoln's Inn-fields, like some other of the old inns hereabout, are like 'oases in the desert' in busy London, but they will, we fear, soon become things of the past at the hands of the L.C.C. Therefore those who desire to secure photographic records of them should obtain them while the opportunity exists and before they pass into the hands of the "house-breaker" and bill-poster. Too often the destruction of ancient buildings is unknown to photographers till they are obscured by scaffolding and posters.

**A Picturesque Spot Threatened.**—Those of our readers who know the walk between Kew and Richmond, by the river, are familiar with the little stream known as the Ha-ha, which flows for about a mile between the old Deer Park and the Thames side, with its overhanging trees and shrubs. This little and picturesque stream the Office of Woods now propose to fill in, and thus one more beauty spot in the neighbourhood of London will be lost to the public. It has, from time to time, furnished much food for the camera, to which it lends itself admirably, more particularly for stereoscopic pictures. As a matter of course, the Town Council of Richmond are protesting, and at its meeting last week it was unanimously agreed that the filling up of this stream would amount to the destruction of one of the most beautiful scenic features of Richmond, and it thereupon appointed a deputation of protest to the Office of Woods. It is to be hoped that the protest will have the desired effect, for it would be an act of vandalism to destroy its beauty. It is, we believe, a quibble between the Office of Works and the Office of Woods as to which shall maintain the stream that has led to the proposal of the latter that it shall be filled in and so destroyed.

**The L.C.C. and Art.**—At the meeting, last week, of the London County Council it was moved by Mr. Granville-Smith that it be referred to the General Purposes Committee to consider and report as to the desirability of appointing a new standing Committee, to be called the "Art and History Committee," to which all questions of an artistic, archaeological, or historical character should be referred, so that the artistic claims or needs of the streets, buildings, monuments, antiquities, statues, and works of art in the metropolis may be fully considered." County Councils have often been taken to task by artists and others for the way they deal with what might be made really artistic without interfering with utility. It seems pretty clear that the London County Council have very little sympathy with art or kindred subjects, from the fact that the proposition to simply refer the question of the desirability of such a Committee to the General Purposes Committee was only carried by a very small majority. This does not look very promising for the report when made, if it be in favour of the appointment of an Art Committee. Of the desirability—nay, necessity—of such a body on the L.C.C. there is no question, if one may judge by what it has already done, and proposes to do, in the way of despoliation.



## ON SETS OF LENSES.

WHEN in 1839 Daguerre and his followers found out the slowness of the optical system then in use, it was of the highest importance for the development of the photographic art to improve on the lens and to provide a more rapid instrument, so that portrait photography might become possible. The want was so strongly felt that the "Société d'Encouragement pour l'Industrie nationale" in Paris put up this question for competition.

There was one way of accomplishing the task which was simple enough to practical opticians. Whereas the lens used by Daguerre, as constructed by Charles Chevalier, was a single landscape lens with the relative aperture  $f/14$ , it was possible, by combining two lenses, to reduce the focal length of the doublet and to increase the relative aperture. Charles Chevalier had made use of this principle some years before (1834), in constructing a new double objective for telescopes, and thus he

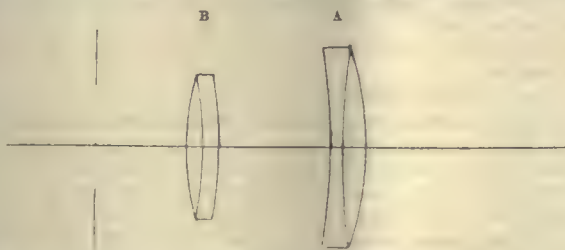


FIG. 1.—Charles Chevalier's Set as given in *Mélanges Photographiques*.

soon produced on the lines indicated above his photographic doublet, which consisted of a landscape lens, A, at the back of the tube, and an achromatised biconvex lens, B, in the front. This latter lens could be changed for another similarly constructed, of greater focal length, and thus one was able to use the three lenses in two different combinations, viz., the back lens combined with the front lens of less power as medium-focus doublet, and the back lens combined with the front lens of greater power as rapid short-focus doublet.

It does not appear, however, that Charles Chevalier advised his customers to use the back lens alone as a long-focus landscape lens. Very likely the rigid camera of his make did not allow of this application, which would be easy enough for a modern camera with considerable bellows extension.

As is easily understood, this arrangement of three lenses enabled the photographer to reproduce his subject from the same standpoint in two different sizes, and so we cannot be astonished that Charles Chevalier obtained the highest prize from the above-named society for his "Objectif à Verres combinés." This prize was a platinum medal, and it was awarded on account of the possibility the objective offered for altering the scale of reproduction.

Similar features are to be seen in A. Ross's Collen lens, made in 1841. The front lens, B, of this doublet could be removed, so that the photo-

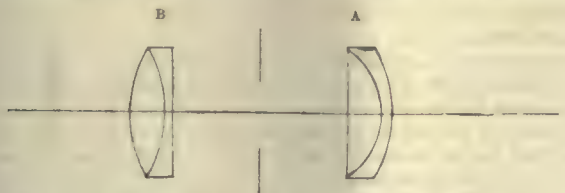


FIG. 2.—A. Ross's Collen Lens as given in *THE BRITISH JOURNAL OF PHOTOGRAPHY*, 1864, p. 329.

grapher was able to use the back lens, A, alone in case of a longer focus being required.

It was the common fault of these two early combinations, which were constructed on the sound idea of the set of lenses, that the spherical aberration was not corrected, and thus neither of them could resist the competition of the Petzval lens.

It is very curious to notice how far the destiny of this combination differed from the idea which its originator formed of it in the beginning. J. Petzval also tried at first to construct a set. The front lens, A, could be combined with either one or the other of two double uncemented back lenses, B of magnifying, and C of diminishing power. The combination, A B, was the world-wide known portrait objective brought out in the autumn of 1840, whereas A and C formed the now forgotten

"Orthoscopic," an objective which raised considerable excitement forty years ago. A B was the extremely rapid ( $f/3.4$ ) short-focus lens, A C

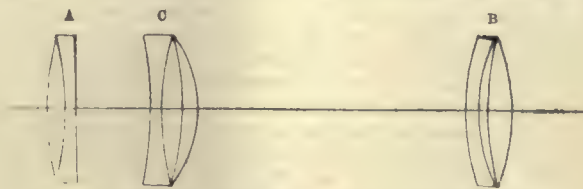


FIG. 3.—J. Petzval's Set as given in *THE BRITISH JOURNAL OF PHOTOGRAPHY*, 1859, p. 3.

an objective of medium rapidity ( $f/8$ ) with an equivalent focus of about the (2.3 fold) length of the former.

The great difference between the two foregoing sets and that of J. Petzval consisted in the correction of the spherical aberration, and there can be no doubt that this set of three lenses (A, B, C) would have met with universal approval had they been brought on the market together. This was, however, not the case, the originators being dissatisfied with the performance of A C, and thus A B alone was advertised.

It is unnecessary to dwell on the properties of this splendid combination—there is no doubt it was the objective needed at that time, and thus the feeble growth of the idea of the set was checked, at least in England. A. Ross took up the Petzval form, and it was not till many years later that his son brought out a modified doublet again. In France, Charles Chevalier held firmly to his idea; he continued to sell his doublet, but even his energy could not prevent its gradually sinking into oblivion.

While these events were taking place in the large factories of A. Ross, Fr. Voigtländer, Charles Chevalier, and others, Thomas Davidson, an Edinburgh optician, took up the almost abandoned idea of the set. In the second volume of the *Photographic Journal* we find an article, "Lenses for General Purposes," by J. Brown, from which we cite the following:—

"I possess a portrait combination made by Mr. T. Davidson, optician, Castle Hill, Edinburgh. The front and back lenses are each cemented, thus having the fewest reflecting surfaces that a lens can have, and thus ensuring the least possible loss of light from reflection of surfaces. The outer lens is 14 inches focus, and the inner lens is 21 inches focus. Thus placed they are 6½ inches focus, and give a half-plate sized picture. They can be reversed in the tube, and give a longer focus, and of course produce a larger picture by being thus reversed; or, if need should be, the 14-inch focus lens can be used for views, &c., and gives a well-covered field and perfect 9 inches by 7 inches. The 21-inch lens, when used for views, gives a picture 15 × 12 inches. Here, sir, is a lens having a four fold use, each change working to the visual and actinic focus perfectly."

Leaving aside the mistake concerning the difference of the equivalent foci of the doublet, we find in this communication no description of the single lenses save that they were cemented; but it is very likely, as seen

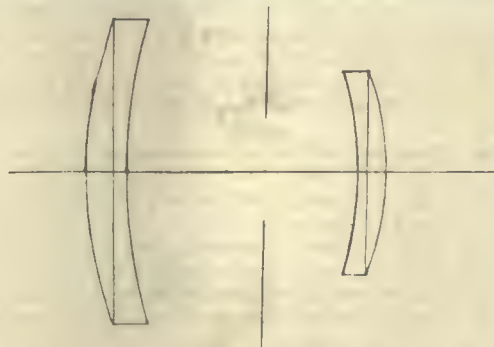


FIG. 4.—T. Davidson's Objective, constructed according to J. Traill Taylor's *Optics*, p. 70.

from later articles by T. Davidson, that these single lenses were of the same construction as Charles Chevalier's landscape lenses, i.e., a biconcave or plano-concave flint lens cemented to a biconvex or plano-convex crown glass.

Supposing this to be correct, we are able to sum up as follows: In the early part of 1855 we find the first real set introduced by T. Davidson of Edinburgh. It seems to have consisted of two similar landscape lenses, which, when used separately, gave the longer foci and which could be



combined to a short-focus double objective. The principal progress was the similarity of the components, which, in the first place, ensured that every one of the single lenses could be equally well applied separately, and, in the second place, that a theoretically unlimited series of different single lenses could be selected to make the set all the more complete. It is obvious that with this composition the greatest number of possible combinations could be obtained; whereas, *f.i.*, the Chevalier set of three lenses gave at most three different foci (one single lens and two doublets) a set of the same number of similar lenses would be equal to six objectives, *i.e.*, three single lenses and three double combinations. Why this system was not accepted by a greater number of photographers I do not know. The late J. Traill Taylor in his *Optics of Photography*, speaking of T. Davidson's lenses, is of opinion that they were not rapid enough to compete with J. Petzval's portrait objective. This is certainly correct as far as portrait photography is concerned, but I do not think the entire matter can be explained in this way. At any rate the system became obsolete, and the new development of the old idea of the set was to take its departure from J. Petzval's portrait system.

It was in 1848 that the Petzval portrait lens was so mounted by Fr. Voigtländer that the front lens could be used, in a reversed position, as a single lens with stop in front. The available aperture was, according to our authority (A. Martin), only  $f/29$ . Thus the Petzval lens had acquired the character of the set again, but of course not nearly to the same excellence as originally intended by J. Petzval. Now, it was, as regards its qualities of a set, on the same level with A. Ross's Collen lens, *i.e.*, it could be used as a doublet, and one of its components as a single lens.

I am not aware whether this modification was adopted in England, but there is no doubt that efforts were made in this country to improve on the Petzval objective in the direction indicated above. Thus, F. Scott Archer, early in the fifties, recommended the putting in of a thin magnifying or diminishing lens between the two components, in order to shorten or to lengthen the equivalent focus of the combination. As regards the optical correction of the system so treated, this plan is certainly a decided drawback to the Petzval formula; but, if we intend to describe the development of the idea of the set, we have to mention it as the form which this idea took in the endeavour to modify the Petzval portrait combination to a set objective.

It is possible that for practical photographers the general applicability was of greater value than the excellence of the different combinations, and therefore we need not wonder that a great many of these sets were sold in England. Anybody interested in the different methods of accomplishing the modification referred to will find ample information in Jabez Hughes' able article, "On the Mechanical Adaptation of Portrait Lenses for View Purposes," published in THE BRITISH JOURNAL OF PHOTOGRAPHY, 1860, pp. 330-1. It may be mentioned here that these modifications on the Petzval lens, according to F. Scott Archer's ideas, were largely carried out, especially in France.

It does not appear that the original Petzval set, when brought out commercially in the year 1857, was very much used. A great rush was certainly made for the *orthoscopic*, for it was—without reason—reported to be free from distortion, and at that time the chief aim of the English and American opticians was to produce an objective free from distortion, regardless even of spherical correction. Thus the Petzval set was brought out too late, and, as far as I am aware, never met with the appreciation which the originator's undoubted skill in balancing the different errors justly deserved.

The above-mentioned efforts to construct an objective free from distortion produced in America the *ratio lens*, the invention of the optician C. B. Boyle. It was in 1863—taking his statement made four years later to be correct—that for the first time after T. Davidson we meet with an objective expressly described as made of two similar components symmetrically placed at proportionate distances from the stop, a combination we may properly call *hemi-symmetrical*, in order to distinguish it from symmetrical combinations in which both components are identical.

I am not aware whether C. B. Boyle advised the use of the components as single lenses or not, neither am I in the position to assert or to contradict a connexion between him and Joseph Zentmayer, the originator of the following set. This American optician worked out in 1865 a set consisting of six single unschismatic lenses:—

- I.  $f=5.333$  inches; II.  $f=8$  inches; III.  $f=12$  inches;  
IV.  $f=18$  „; V.  $f=27$  „; VI.  $f=40.5$  „

These single lenses were suitably mounted, so that each one of them

screwed into the tube was in its proper position to the stop. The combinations gave the following focal lengths:—

- I., II.  $f=3.35$  inches; II., III.  $f=5.333$  inches; IV., V.  $f=8$  inches;  
IV., V.  $f=12$  inches; V., VI.  $f=18$  inches.

Judging from these numbers, we do not think it likely that J. Zentmayer intended the use of the single lenses, because the foci of four of them were contained in the series of the focal lengths of the doublets, whereas the camera extension necessary for V. and VI. probably prevented the employment of these lenses.

Summing up the foregoing, we may remark that the practical execution of the idea of the set was developed in two directions; in the first place as an entirely unsymmetrical set mostly on the basis of the Petzval portrait objective according to the rules laid down by F. Scott Archer; in the second place as a symmetrical set as probably first intended and introduced by T. Davidson, of Edinburgh; later again, but only partially, by J. Zentmayer. Comparing the value of the two possibilities, we may justly remark, that the first is inferior to the second, especially as regards the possibility of using the components in the greatest number of combinations.

In the sixties we do not meet with the asymmetrical sets constructed on the Petzval objective; only in 1863 A. Davanne describes a set of nine lenses which contained the two components of Petzval's portrait lens; the other seven seem to have been similar and interchangeable.

Later on, in 1883, Thomas Funnell took up the idea of the asymmetrical set again in a somewhat interesting manner. His objective is similar to a certain extent to objectives constructed by J. T. Goddard, and consists of a cemented front combination and an open back combination. This latter is composed of a negative flint lens close to the stop and a plano-convex crown lens, A, at the end of the tube, which could be

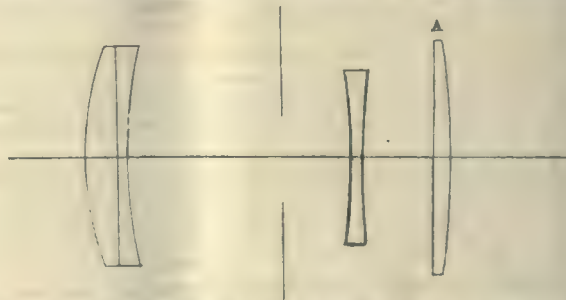


FIG. 5.—T Funnell's Objective as given in THE BRITISH JOURNAL OF PHOTOGRAPHY, 1883, p. 238.

unscrewed and replaced by another crown lens of different focal length. It is easy to see that, in substituting divers single back lenses to the compound front and the dispersing lens in the middle, the equivalent focus of the different combinations will also vary. T. Funnell does not say anything about the accompanying alteration in the chromatic correction in the different combinations formed according to his idea, and perhaps—apparently not manufacturing the lens for sale—he overlooked the matter entirely.

In very recent times, Mr. H. Dennis Taylor seems to have taken up an analogous idea\* of substituting the back lens of a triplet by other single lenses of different focal lengths, and accomplishes at the same time the chromatic correction by using different glasses for the divers additional back lenses, so that the single lens of the least power is made of glass of the greatest dispersion.

Another revival of the unsymmetrical set was brought about by H. L. Aldis, of the firm J. H. Dallmeyer, Ltd., in the *Stigmatic*, Series II. This astigmatismally corrected objective can be divided into two dissimilar components which can be used separately as long-focus lenses.

The rest of this historical paper may be devoted to the development of the symmetrical set.

There is no doubt that the discovery of the *symmetrical (rectilinear)* very much facilitated the construction of symmetrical sets based on this type of construction. It seems that sets of similar lenses achromatised in T. Grubb's manner were largely produced, especially in France, and particularly in the time preceding the introduction of the new glasses. We find many advocates of this contrivance, and among them the late J. Traill Taylor; he frequently advised his readers to use the set, or the casket lenses, as he sometimes styled them, because they placed a great

\* THE BRITISH JOURNAL OF PHOTOGRAPHY, 1899, pp. 199, 200 (March 31).



power into the hands of the photographer. We must, however, admit that the back lens of a symmetrical (rectilinear) did not possess the highest degree of perfection, especially as regards the correction of the oblique pencils.

The decisive departure from this state of the matter was taken by Dr. P. Rudolph of Jena. After the definition of his principle for producing astigmatic correction together with flatness of field, he saw, 1891, the possibility of correcting a single lens for the oblique pencils. This construction, however, was replaced by another brought forward in 1895, as any one interested in this matter may see in this JOURNAL, 1894, p. 829. These lenses are manufactured and sold in England under the name of *convertible anastigmats*. The single lenses are corrected both spherically and astigmatically: two of them not too different as regards focal length form a doublet of considerable aperture (1:6.3 to 1:7.7).

Thus the old idea of T. Davidson is accomplished in a modern anastigmatic objective, which yields three objectives of different focal lengths and having the fewest reflecting surfaces possible. R.

### SPEED SCALES.

I HAVE seen with much pleasure in your number of the 5th ult. that Mr. Hett has taken up the subject of speed scales as being well worth the attention of scientific bodies, and of all photographers who have at heart to work on mathematical principles.

The importance I attach myself, in my restricted sphere of action, to the said subject, is evidenced in my article headed, "Photometers, Actinometers, Exposure Meters, Exposure Tables, &c.," to which you gave hospitality in your ALMANAC for 1898, p. 705; and as I have since then unremittingly continued in photographic pursuits, by the aid of an exposure meter as my guide and faithful companion, I gladly corroborate Mr. Hett's appreciations, to the extent of asserting my firm belief that very, very numerous as are already the adepts of the black art, legion they would become if they only knew what increase of knowledge, precision, and pleasure they would derive from investing a few shillings in an instrument or two, so as to be able to expose with almost unerring accuracy, in the easiest as well as in the most difficult cases.

To contribute as much and as well as I could to the table-making of comparative figures expressing the speed of plates and their time-exposure, derived from direct actinic light, and following therein Mr. Hett's footsteps, I have constructed the table, as under, on a somewhat different basis to his, having aimed at showing, at a glance, by the actual working of the respective light meters, that all comparative terms indicated are in strict relation to each other, their concordancy being established in the table on only one term of diaphragm and one actinometric term of light for every case tested; but the same correctness and correlation exists for all other factors, and thus renders useless more numerous terms of comparison.

Let us take, for instance, Wynne's F plate speed 39, with *f*-32 diaphragm and 3 seconds actinometer light, and the meter will show—

F 39 - 3  
,, 32 - 2

2 seconds being, in this case, the correct time of exposure.

Compare this now to Watkins' system. To Wynne's *f*-39 speed, the corresponding Watkins' P speed is 24, and we establish the following meter indications—

P 24 first ring.  
D 32 second ring.  
A 3 = E 2 third ring,

or 2 seconds exposure as in Wynne's instrument; any other terms of comparison giving similar results.

Photographers using both instruments will find out that they are constructed on the same principle, the latest-born being, perhaps, more ingenious and more rapid in its working than the first-born, owing to the time of exposure being shown almost magically in one single rotary movement, with the actinometer light illuminated in the centre; but, on the other hand, in the rival meter, the blue glass through which the sensitised paper is seen reaching the standard tint, when exposed to the daylight, is so perfect in its operation, for both whole and quarter tints, that whoever has first worked with one meter and then studied the mechanism of the other will deem it almost necessary to possess the two meters, for the sake of more rapidity in working with one and more security as to the time of exposure with the other. There is, indeed, no doubt, in Watkins' instrument about the accurate concordant decolouration of the sensitised paper, whether this be due to an optical effect

produced by the blue glass or by a different quality of the sensitised paper.

Of course, one maker will consider his instrument the best, and as they are both good, practical, and efficacious, the disadvantages of one being compensated by the advantages of the other, the best the makers can do is to amalgamate their interests, fabricating an instrument combining a simple rotary movement with more correct actinometric exposure. Our two photometric Edisons will surely not repent having cast their lot together, as a perfected instrument would likely considerably increase its sale.

To the following table I have appended several explanatory remarks to make it thoroughly intelligible.

*Comparative table of figures expressing the speed of plates according to Wynne's and Watkins' principles and instruments with actual times of exposure of such figures in relation to f-16 diaphragm and four seconds actinometric light; also comparative table of speed numbers between Wynne's and Hurter & Driffield's systems.*

a	b	c	d	e	f	
Relative Speeds of F and P.	Wynne's F Plate Speeds.	Watkins' Exposure-time with f-16 diaphragm. 4" act. light.	Watkins' P Plate Speeds.	Watkins' Exposure-time with f-16 diaphragm. 4" act. light.	Comparative Plate-speed Numeration between Wynne's F and Hurter & Driffield's.	
1	8	16"	1	16"	8	3"
2	11	8	2	8	11	1½
4	16	4	4	4	16	3
8	22	2	8	2	22	5
16	32	1	16	1	32	12
24	39	¾	24	¾	39	18
32	45	¾	32	¾	45	25
48	56	¾	48	¾	56	37
64	64	¾	64	¾	64	50
96	78	¾	96	¾	78	75
128	90	¾	128	¾	90	100
160	101	¾	160	¾	101	125
256	128	¾	256	¾	128	200

### Explanatory Remarks.

a. This column represents the relative speeds in Wynne's and Watkins' methods, with figure 1 as starting point, the upright figures constituting a geometrical progression with 2 as common ratio, and the italic figures the multiplying terms by 1 for intermediate exposures.

b. These are Wynne's usual plate-speed symbols, designated by him as *f*, and worked upon in his exposure meter.

c. Here we have the exposure times found by Wynne's exposure meter, for speeds indicated in columns b, with a *f*-16 aperture and four seconds actinometric light.

d. In this column is indicated Watkins' plate-speed symbols, known as *p*, in relation to Wynne's *f* speed symbols.

e. These are the exposure times found by Watkins' exposure meter for *p* speeds indicated in column d, such results being exactly the same as those found by Wynne's meter, and thus testifying to the correctness of this comparative table.

f. This is a table by itself, showing the exact relation between Wynne's and Hurter & Driffield's speed numerations.

Before terminating this article I will still explain for the sake of photographers who are not familiar with direct-light exposure-meters that Wynne's *f* plate-speed numeration signifies a figure indicating the size of the aperture of the diaphragm through which the plate would receive the correct impression of the image of a normal subject with a known actinometric light, whilst in Watkins' numeration the standard for speed, P 1, is such that with *f*-8 diaphragm it requires an equal exposure to the actinometric value of the light. Based on this simple theory, our table has been constructed, and we hope we have made ourselves understood.

GEORGES FARNAU.

### ANOTHER FLASHLIGHT ACCIDENT.

THERE has been another flashlight accident, with fatal result, this time in America, one being killed and several injured. It seems, from the accounts in the daily papers, that the *Columbia*, which is to compete with Sir Thomas Lipton's yacht, the *Shamrock*, for the America Cup, was launched in the evening so as to prevent photographs of her being taken. But a photographer was there, and thought to be equal to the occasion by being provided with a flashlight with which to secure a photograph. Un-



Unfortunately, however, the can of powder exploded, a boy was killed outright, and two severely injured, and others more or less so. Accidents with flashlight powders are continually happening, though some of the powders are said to be perfectly harmless. It would be valuable information to users of flashlights if we were told the composition of those with which the accidents have occurred. All we learn is that "the flashlight powder" exploded. The unfortunate thing in connexion with these compositions is that they seem harmless enough under test conditions, but appear to have a proneness to go off spontaneously when least expected. We have frequently cautioned our readers with regard to the danger of flashlight mixtures, and recommended that the ingredients be kept separate and only mixed with great care at the time of using. This, of course, only applies where the powder is compounded by the user. Several of the powders sold, however, are secret preparations.

### CELLULOID FOR MEASURES.

At a recent meeting of one of the London societies a member alluded to the lack of enterprise in British manufacturers, remarking, according to the report, "that he had at one time tried to induce certain firms working in celluloid to put upon the market graduated measures and other photographic accessories, but was disappointed at the lack of enterprise which he found." A charge of want of enterprise is frequently brought against British manufacturers which is often not well founded. British manufacturers, as a rule, are conscientious and slow to put upon the market articles that they know will not answer the purpose for which they are intended, and that is possibly why they have not adopted the suggestion of celluloid measures. Celluloid, or xylonite, can be produced in close imitation of ivory, but it will not do for ivory scales, rules, or other instruments of precision for which ivory is used, by reason of its shrinkage, owing to the gradual evaporation of one of its constituents, the camphor. The same would, of course, be the case with graduated measures. Moreover, celluloid is softened by heat, and it would therefore be unsuited for measuring hot solutions. Further, it is also soluble in many of the substances that have to be measured—even in photography. For example, it is very soluble in acetone, which is now sometimes used with the developer; so it is in acetic acid, in alcohol, ether, &c. Probably it is the knowledge, by the manufacturers, that celluloid or xylonite measures would be quite unsuitable for general laboratory purposes that has deterred them from putting measures made of that material on the market, and not their lack of business enterprise.

### THE PERMANENCE OF SILVER PRINTS.

A CONTRIBUTOR to the *Photographische Chronik* gives the following particulars of a series of trial prints he has made to ascertain their relative permanence. Six different processes were compared:—

1. Arrowroot paper (prepared by the writer).
2. Albumen paper " " "
3. Matt gelatino-chloride paper, without baryta substratum.
- 4, 5, and 6. Collodio-chloride, gelatino-chloride, chloro-albumen emulsion paper, each with a baryta substratum.

Each print was washed on the day of printing for the same length of time, and the interval between washing and toning was the same in each case. The prints were toned in the same bath and washed before fixing. The strength of the hypo bath was one in twelve, and each print was fixed for the same length of time. They were then washed for four hours each in running water. The prints were surface-dried with pure filter paper, and mounted upon good cardboard (the same in each case) with freshly prepared starch paste. The prints were then exposed for eight weeks in a show-case upon the sunniest part of the external wall of a photographic studio. Result:—

Nos. 1 and 3, upon arrowroot paper and matt gelatino-chloride, without baryta substratum, were unchanged.

No. 2, upon albumen, showed a slight change of tone, but were otherwise good.

Nos. 4, 5, and 6 were in such a condition that any photographer would be sorry to see them if they were prints he had recently sent out.

The writer infers that hyposulphite is not readily removed from a baryta substratum, and that the general opinion that emulsion prints require less washing than others is erroneous. It is self-evident that the hypo saturates the paper, but the presence of a baryta substratum renders its elimination more difficult than in the case of prints without the substratum. There is also the possibility that the substratum forms a

compound with the hypo, which, if retained, acts deleteriously upon the print. The experience of many photographers we know in this country is opposite to this, and others find gelatino-chloride prints more permanent than albumen prints, much as they like the latter process.

### PHOTOGRAPHY IN DOTS.

No doubt there are readers of THE BRITISH JOURNAL OF PHOTOGRAPHY who, if they knew what a simple matter it was, would like to produce a great many of their photographs in dots or what is called grain. The advantages of this kind of work are at least twofold. For many subjects, such as rural scenery and large heads, a grain which simply gives one the idea of a beautiful stipple certainly enhances the softness of the result and takes away that tiring impression of *photograph*. The other advantage is that the photographer will gain much if he then takes a small print, copies it through a grained screen, prints it on transfer paper (to be obtained cheaply from dealers), or a polished zinc plate, and so commences to learn what will, I believe, become an important adjunct to, and inseparable from photography, viz., process work; he may then try his hand at *etching* the zinc. He may also make his own screen, or he may purchase one cheaply—so cheaply, that it would scarcely pay to go to the trouble and dirtiness of making, to say nothing of his having to acquire experience before succeeding. But to return to our subject. There are two ways of obtaining a negative composed of dots. The one is by the use of the ruled screen, the other by the stippled or grained screen. What, then, is the difference between the two? I suppose the ruled screen is used in ninety-nine cases out of a hundred for process work. It is the screen the process workers "swear by," they having got thoroughly imbued with the idea that all process negatives must be made with it.

In artistic work, however, it would be quite useless for producing any pleasant effect such as suggested for large heads or rural scenes. It is, in fact, so unpleasant to the artistic eye, so offensive to artistic taste, that to use it for *effect* would be artistic feeling run mad. We will dismiss it, then, for such purposes, although it would be well to just pause and consider what is the difference between light coming from a lens through small openings such as a ruled screen gives, and coming or passing round an opaque particle or particles as in the grained screen?

The ruled screen produces numberless points of light, which impinge upon the sensitive surface of the plate; the grained screen produces numberless points of shadow by virtue of opaque specks, the light which reaches the sensitive plate in this instance being intersected by grain. Can we, therefore, expect to get in process work results equal in each system? I am now discussing the practicability of using the grained screen for process work, and for the following reason: if a correct copy can be made with a grained screen at 5s., and with less trouble, then why use the ruled screen at all? A similar ruled screen would cost five or six pounds; so far as cost is concerned there is an immense margin of advantage.

Many firms have tried the grained screen and confess to being unable to obtain the necessary results, but I think we must also consider that, just as ruled screens came into use through first one little improvement and another, everybody trying to get a more perfect result than everybody else, so the same amount of evolution should bring about like results with the grain—it would appear that grained screens have had the "cold shoulder" for a long time now. We should also remember that, if the grained screen is old, so is the ruled. I think I am correct in saying that Fox Talbot experimented in this direction with rulings. Single rulings, i.e., rulings in one direction only, were first used, and with these half the exposure was often given with the screen in one position, and finished by reversing the screen so as to get a crossed line; but is it practical to get a small shadow dot or a small high-light dot (one white, the other black) with grain only to work from? At the outset I would point out, first, that over-exposure has a tendency to produce a coarse grain, and that there is no particular distance to be observed in placing a grained screen from the sensitive plate, as the grain must be absolutely in contact with the film. It should be borne in mind that our light is not going to spread by using a certain shaped stop, or any vignetting take place by altering the position of the screen. The grain is going to show in different qualities of fineness according to the selection of light and shadow. Taking the middle tint or tone of our copy, merging to highest lights we get a gradual loss of the standard grain through filling in first the very finest points or particles, then the coarser, until we finally have nothing left but here and there small openings left by the most opaque points, and away down towards the shadows there will be a tendency to produce innumerable fine points, which, clustering together, form substance enough for intensification to lay hold of. This is the selective principle which I have found the light to produce upon a screen I have succeeded in producing by very simple means, and which can be made either for large work or fine. In speaking of fine work I would say that screens can be produced with such a fine grain that the result appears almost like colotype. I think it is a mistake to aim at too uniform a structure in producing grained screens, as it would appear to subdue to a large extent that selective power produced by the lights and shadows of a



picture. There is also a danger of erring on the other side, viz., too great a contrast in structure. Be this as it may, grained screens for giving an artistic effect to a picture are well worth trying. Of course a very fine grain would not be used for artistic work, as it would scarcely be observable. Photographing, or I should perhaps say enlarging, through cloth, or, to be precise, a very finely woven thin silk, commonly called bolting cloth, for the purpose of giving grain, has to my mind always been one of those ideas which tries to make a picture appear what nobody is going to believe it is—an effect on canvas. This, I know, has been largely used; but, if it has no other effect than taking away the crispness or sharpness of a picture, it has succeeded in that. Now, in conclusion, let me remark that with the grained screen we get this same appearance of general effect or roughness without actually having the sharpness of our picture interfered with, and is well worth a trial by any one who wishes to show an effect not obtainable in any other way—so far as simplicity is concerned.

F. G. WILLATT.

### HOLIDAYS AND HAND CAMERAS.

ONE of the first things a man buys when the calendar and hot weather and brilliant sunshine remind him of holidays is a hand camera. His ignorance of the photographic art may be colossal, but his equipment for a holiday is not considered complete without the instrument above mentioned. Is Jones going to Egypt? Every one tells him that he must certainly take with him etc., etc., and bring back records of etc., etc., and thus one more is added to the ragged army of photographic recruits. There is no doubt that many a holiday is utterly spoiled by this inconsiderate meddling of friends and outsiders. Jones, for instance, would be, most probably, far happier without the camera, and, if very sharp and spry, will buy a cheap outfit, drop the same into the Nile at the first convenient opportunity, and let some one else take the photographs.

Now, as a general rule, and admitting the fact that nothing we say is likely to alter the existing state of things as briefly outlined, it is extremely unwise and unsafe, from the technical aspect, to start off on a holiday with a new camera; this is often done, I know, by men who may be termed expert camerists, as well as the immature and embryo amateur. A camera with a changing arrangement of any kind, subtle or otherwise, cannot be too frequently tested and practically worked before taking it into use for serious holiday work. I know of no exception to this rule. It is not a bad plan to let some friendly enthusiast do this for you; there are plenty of amateurs who thrive on failures, nothing seems to cool their ardour, and the merest glimpse of a good negative starts them off afresh every time. Such a man will be delighted to take out the new apparatus and rub off the sharp corners of the inside fixtures, and generally dull the glittering newness of the exterior: there is no greater error than to start off holiday-making with a camera not fully proved, not that the mere testing of the apparatus is a sufficient guarantee, for I distinctly remember one camera which worked admirably in the house and in the office of the manufacturer (where you went to make things warm for him), but which invariably went wrong outside. There are two classes of cameras, those which work satisfactorily only when new, and those which require the discipline of one or more seasons to bring them to their best—and, as a rule, the latter is by far the better article—for various reasons I must not further particularise.

A holiday, as such, to be enjoyable should be free from mental worry and physical discomfort, consequently the camera must be small, light, and portable; in cycling the difficulty is where to hide it; if it can be carried in the hand, gently swaying to the movement of the "bike," we have the best safeguard against vibration and its attendant evils, dust spots, and, worse than all, disarrangement of internal fittings, such as the unrolling of a spool of film. The spring carrier projecting over the handle bar is safe, no doubt, but rather prominent and aggressive. Looking at it all round, I think the most convenient place is on the lamp bracket; most of the smaller hand-cameras, Kodaks, and other magazine film cameras are little heavier, if at all, than the average cycle lamp of to-day, and certainly not so heavy as the old bulky monstrosities of ten years ago, they might easily be made to fit in exactly the same way as a lamp, and with plenty of spring to avoid vibration; the apparatus is in full view, not too much in sight as to be objectionable; in short, we avoid carrying our camera as if it were a Chinese lantern, while for the lamp itself there is room for this on the front fork lower down.

For holiday work, with the cycle especially, all the advantages are mainly with films, rollable and flat; celluloid films may be backed with black gummed paper and other halation preventives, and can be had of varying speeds, but the advantage of using for different subjects backed films, isochromatic films, and films of ordinary and extraordinary rapidity means that dark slides must be carried. It is marvellous, however, what may be done with a length of rollable film of necessarily uniform speed on a holiday tour, embracing a variety of subjects and exposures; provided we are using a lens fitted with diaphragms and a shutter capable of adjustment, the results of exposures may often be extremely uniform, and interiors even, by some dodging of the windows, will be very far from failures. The diaphragms and adjustable shutter require plenty of discretion in their use; if the lens is known to give the requisite sharp picture with a full opening, which may be *f*-10 or *f*-12, it will be well to

take advantage of its capacity and cut down the exposure somewhat. In no other branch of photography is more discrimination required than in hand-camera work, the selection of subject, and the lighting of it, what may be done, and what is best left alone; there are few days when we can say that nothing need be attempted, even with a hand camera, for the lens working at a full aperture will, when we have mastered its powers, do practically all we want; nor are dull, cloudy, sunless days to be despised—sometimes, as I know by painful experience, we may get nothing else; but, nevertheless, not a few picturesque bits are to be seen in our albums, showing that our holiday has not been, from the photographic point, entirely a failure.

J. PIKE.

### NON-ACTINIC APPARATUS FOR DEVELOPMENT.

MR. THEODORE BROWN has devised an apparatus by the aid of which photographic plates or films may be developed between two or more pieces of non-actinic or coloured glass, capable of substantially reducing the power of white light.

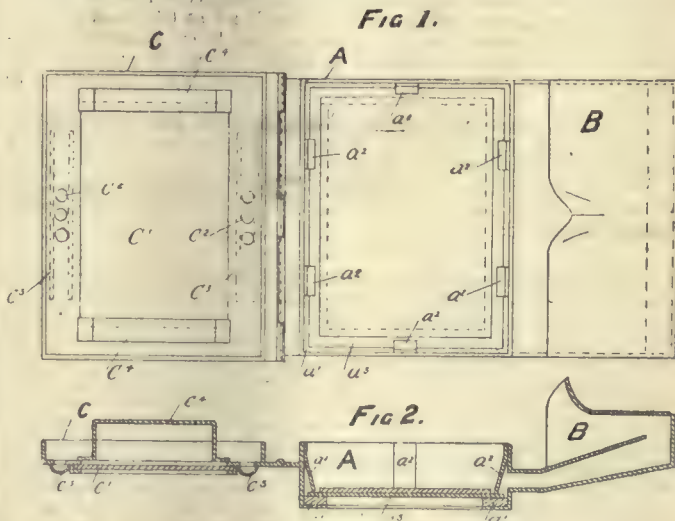
Fig. 1 shows in plan the complete apparatus, and fig. 2 a side section of same. The apparatus comprises a box, A, with a hinged lid, C, having attached to its side a kind of ante-chamber, B. The bottom of the box is fitted with a piece of coloured or non-actinic glass,  $\Lambda^2$ , covering a suitable size opening made in the bottom and resting upon a rubber moulding,  $\Lambda^1$ , fixed to the bottom of the box.

The said coloured or non-actinic glass,  $\Lambda^2$ , is kept in position by being tightly pressed against the said rubber moulding,  $\Lambda^1$ , by a suitable number of metal tongues or springs,  $\Lambda^3$ , attached to the side of the box, A, and thus producing watertight joints.

The glass in the bottom of the box, A, is so fitted, as described in order that it may easily be replaced with a fresh piece, should it get broken or damaged in any way.

The lid of the box, C, is also fitted with a piece of coloured or non-actinic glass,  $C^1$ , but is permanently fixed as shown in fig. 2.

The cover, C, is perforated at two sides, at  $C^2$ , which perforations are



arched over at  $C^2$  in such a manner as to exclude direct rays of white light from the box when it is closed.

Two projecting parts,  $C^4$ , are fixed to the under side of the cover, C, so that when the box is closed the said two parts,  $C^4$ , extend toward the bottom of the box far enough to prevent the photographic plates or films from loosely falling about when the box is closed.

The ante-chamber, B, is so constructed that direct rays of white light may not enter the said box, A, but at the same time will permit of the entrance of liquids.

The photographic plates or films intended for development are placed in the box under cover from daylight, and the lid closed.

The apparatus containing the photographic plates or films is then taken out into broad day or artificial light.

The liquids employed for the development is then poured into the ante-chamber, B, and allowed to run down into the box, A, containing the photographic plates or films, by laying the whole apparatus flat on a table. When the operator desires to examine the progress of the development, the plate or film is examined by allowing the liquid to drain off into the ante-chamber, by holding the apparatus up before a strong light. When the various stages of development have been performed in this manner, the cover is opened and the photographic plate or film is taken out and dried in the usual manner.



## THE AUTUMN EXHIBITIONS.

We append particulars of four important photographic Exhibitions to be held next autumn.

## ROYAL PHOTOGRAPHIC SOCIETY.

The Exhibition will remain open daily (Sundays excepted) from Monday, September 25, until Saturday, November 11, from 10 a.m. till 5 p.m. It will also be open on Monday, Wednesday, and Saturday evenings, from 7 to 10 p.m., when lantern slides will be shown.

Medals will be placed at the disposal of the Judges. Exhibitors may state whether they wish their exhibits to be placed in the Pictorial or the Technical and Scientific Section. Exhibits not marked P. or T. will be dealt with in such section as the Selecting Committee may consider appropriate, but exhibits may be excluded from the Technical and Scientific Division unless the points of special interest are distinctly stated. The Exhibition will be conducted according to the rules adopted at the Conference of Judges.

The Judges are:—Pictorial Section: Mr. Harold Baker, Colonel J. Gale, Mr. A. Horsley Hinton, Mr. B. W. Leader, R.A., Mr. W. L. Wyllie, A.R.A. Technical and Scientific Section: Captain W. de W. Abney, C.B., F.R.S., Mr. T. Bolas, F.I.C., F.C.S., Mr. Chapman Jones, F.I.C., F.C.S.

The following comprises the Selecting and Hanging Committee:—Pictorial Section: Mr. R. Child Bayley, Mr. J. A. Hodges, Mr. H. Vivian Hyde, Mr. A. Mackie, Mr. J. C. S. Mummery, Mr. J. B. B. Wellington. Technical and Scientific Section: Captain W. de W. Abney, C.B., F.R.S., Mr. T. Bolas, F.I.C., F.C.S., Mr. F. A. Bridge, Mr. Chapman Jones, F.I.C., F.C.S., Mr. J. J. Vezey, Mr. E. J. Wall.

Each exhibitor must fill up the entry form supplied by the Society, and send it by post to the Secretary, Royal Photographic Society, 66, Russell-square, London, W.C., on or before Tuesday September 5, or deliver it with the exhibit (not packed) by hand at that address on or before Wednesday, September 6, at 9 p.m.

Exhibits sent by carrier must be *carriage paid*, and addressed to the Secretary, Royal Photographic Society, 66, Russell-square, W.C., and must arrive on or before Tuesday, September 5. No charges whatsoever will be paid by the Society on exhibits sent unpaid or upon which the carriers require payment, and all exhibits so tendered will be refused.

Exhibits not packed may be delivered by hand at 66, Russell-square, W.C., at any time between 10 a.m. and 4 p.m. before Wednesday, September 6. On that day they will be received from 10 a.m. to 9 p.m., after which time and date no exhibit can, under any circumstances, be received.

Very large frames and bulky or fragile apparatus may be delivered at the Gallery, 5a, Pall Mall East, if special arrangement, *beforehand*, is made with the Secretary.

Blank entry forms and any further information respecting the Exhibition can be obtained from the Secretary of the Society, 66, Russell-square, London, W.C.

## THE PHOTOGRAPHIC SALON.

The Seventh Annual Exhibition will be held at the Dudley Gallery, Egyptian Hall, Piccadilly, from September 22 to November 4, 1899. The receiving day is Monday, September 11, from 10 a.m. to 6 p.m., on which day all pictures for exhibition must be delivered at the Gallery, either personally or through an agent.

Careful consideration will be given to all pictures entered for exhibition, and a selection of works of pictorial merit made by the Committee. Pictures which have already been publicly exhibited in London will not be accepted. Pictures sent for exhibition to any other exhibition open in London at the same period are liable also to be disqualified. No awards are offered, and no charge is made to exhibitors. Exhibitors will be entitled to a season ticket. Arrangements will be made for the sale of pictures, if desired, and a commission of fifteen per cent. will be charged on sales effected.

Pictures will be received at the Dudley Gallery *only*, on Monday, September 11, from 10 a.m. to 6 p.m.

Mr. William Whiteley, of Westbourne Grove, will undertake to receive, deliver, and return exhibits.

Terms and all other particulars may be obtained of the Hon. Secretary, Photographic Salon, Dudley Gallery, Piccadilly, W.

## THE PHILADELPHIA PHOTOGRAPHIC SALON.

The Pennsylvania Academy of the Fine Arts announce that, under joint management with the Photographic Society of Philadelphia, the Philadelphia Photographic Salon for 1899 (second year) will be held in the Galleries of the Academy, Broad-street, above Arch, from October 22 to November 19, 1899.

Pictures which have already been shown in Philadelphia at any exhibition open to the general public will be liable to exclusion.

No awards are offered, and no charge will be made to exhibitors. Each exhibitor will be furnished with a catalogue, which will be the official notification of acceptance.

No exhibitor may submit more than ten pictures, each of which *must* be framed separately.

Arrangements will be made for the sale of pictures if desired, subject to a commission of fifteen per cent.

All communications and all pictures submitted for exhibition must be addressed to the Pennsylvania Academy of the Fine Arts, Broad-street, above Arch, Philadelphia, Penna., U.S.A. All pictures must be forwarded at owner's risk, *carriage prepaid*, and delivered at the Academy not later than 5 p.m., Monday, October 2, 1899.

Mr. A. Horsley Hinton, 1 Creed-lane, Ludgate Hill, London, E.C., has consented to act as general foreign representative. Circulars, entry forms, labels, &c., also any special information desired will be furnished by him on application.

The following shipping agents have also been appointed:—Mr. William Whiteley (Mr. Wiggins, manager, Shipping Department), 115, Queen's-road, W., London, England; and Messrs. Guinchard & Fourniret, 76, Rue Blanche, Paris, France.

The following is the jury of selection:—Mr. F. Holland Day, Boston; Mrs. Gertrude Kasebier, New York; Mr. Clarence H. White, Newark, Ohio; Miss Frances B. Johnston, Washington, D.C.; and Mr. Henry Troth, Philadelphia.

## THE CROYDON CAMERA CLUB.

The Croydon Camera Club will hold an Exhibition at the Art Gallery, Park-lane, Croydon, in the week, October 18 to 24 next. There will be open classes for prints and slides, and a special class for amateurs resident in the borough of Croydon. The prospectus will shortly be issued.

## THREE-COLOUR WORK AND THE KURTZ PATENT IN THE UNITED STATES.

Mr. A. C. AUSTIN has the following observations on this subject in an American contemporary:—

Banning and Banning, of Chicago, Ill., specialists in patent law, have sent the following letter to a number of photo-engravers throughout the country during the past few weeks, causing in some cases a little trepidation, and in nearly all cases considerable discussion concerning the matter at interest, the Kurtz patent.

"Messrs. GENTLEMEN,—As attorneys for the New York Colortype Company, we hereby notify you that in its photo-mechanical printing your company is infringing the William Kurtz patent, No. 498,396, dated May 30, 1893, owned by our client; and we hereby request you and your company to immediately desist from further infringement thereof. Unless you are willing to do this, we will have to begin suit for an injunction and damages. Requesting an immediate answer, Yours very respectfully, BANNING & BANNING."

Chicago, April 13, 1899.

In reading the above one's attention is impressed with the singular fact that a New York corporation is represented by Chicago attorneys, and the natural inquiry is, Why? A little quiet investigation develops an assertion that the New York Colortype Company, a recent corporation formed upon the ashes of the old Colortype Company, have secured all the right, title and interest in the Kurtz patents with the avowed purpose of prosecuting all infringers, and with the expectation of making more by the granting of licences than they can by the making of the colour plates, provided, of course, that they can maintain their patent rights.

Rumour has it that there is a strong combination between the New York corporation and the Chicago Colortype Company, which would account for the western attorneys, and, although this has been denied by one of the officials of the New York company, it seems very reasonable. The New York official asserts that the Chicago firm is working under licence, which is the only interest they have.

The one and the other assertion are immaterial to the majority of us. We have only to consider as to whether it is safe for us to defy the threatened injunctions, or whether we should be prudent and endeavour to negotiate for a licence or go out of business. With a view of determining the best course of action, let us study the facts in the case. In the letters patent, Mr. Kurtz recites the reasons for the "moiré effect," or "confusion of lines," that result from the printing of one half-tone over another, and claims that the only way such results can be avoided is by the use of "a screen with parallel lines running in one direction only, the lines of one negative running in a different direction from the lines of the other negative," &c. On the face of it, we who have long since learned to regard the single-line screen as obsolete and to recognise the advantages of a cross-line screen in connection with an elliptical or slit diaphragm, laugh at Mr. Kurtz' claims, and think there can be no possible cause for action from the fact that we do not nor would not use a single-line screen if we could do so without any interference. Possibly, though, we are laughing a little too soon, and for us to maintain a right to use a cross-line screen is but playing into the enemy's hands. Let us ask ourselves, What is a cross-line screen? and what can we say but that it is a screen composed of two single-line screens cemented together with the lines running in opposite directions? Here indeed is a problem for legal solution. Do two single-line screens cemented together as a homogeneous whole still retain their single line characteristics, or does the fact of their being joined together endow them with properties so totally different as to render them a distinctly different thing? Are there any properties within the possibilities of a cross-line screen that cannot be demonstrated with a single-line screen?

If these questions can be answered in the affirmative, it would seem as



though Messrs. Banning & Banning had a difficult task before them. There are a great many things to be taken into consideration. Whether we can or cannot do this or do that is a question for the courts to decide, and meanwhile they who act in defiance of the Messrs. Banning's warning lay themselves liable to damages if in the end the decision should be favourable to the maintenance of the Kurtz patent.

Probably a goodly number who have found three-colour work anything but profitable will grasp the opportunity as an excuse for quitting the field, because in this way they can gracefully desist without having to acknowledge a failure. Many cannot fight because of financial reasons and many will not fight from prudence. Therefore, be it "bluff" or be it belief in vested rights, the Kurtz people seem to have the better end.

What shall we do about it? Do we really need three-colour work to help along a business that all acknowledge is not the best in the world? Is it best to put it aside that it may become a monopoly? I believe we do need it, because there is a margin of profit in the work if properly conducted, and certainly we need all the profit that is possible in the photo-engraving line.

I do not think Mr. Kurtz' successors deserve to monopolise the whole thing, for neither they nor Mr. Kurtz, for that matter, have made the process what it is to-day. Many bright minds have given serious study and many dollars to its perfection, and, if it had not been for these bright minds and many dollars, the process could not have been a commercial success, for Mr. Kurtz and his original company made a sad failure themselves.

Looking at it in this light, it would seem best to fight the issue. Make combined effort. If each and all contribute, the individual tax would be but nominal, and it is only by combination that we can ever expect to for ever set at rest the uncertainty.

#### YORKSHIRE PHOTOGRAPHIC UNION: FIRST ANNUAL EXCURSION.

THE Yorkshire Photographic Union is yet in its infancy, but it must be admitted the infant is an exceedingly healthy and energetic one. Many difficulties attending the final establishment of the Union have had to be overcome, relieved not one whit by the unkind croakings of adverse critics. However, to a greater or less extent, this has been abortive, and the Union is now recognised as one of the institutions of the county. To the energy of the President (Mr. Percy Lund), the Hon. Secretary (Mr. Ezra Clough), and the committee generally, the bulk of this success must be ascribed.

Saturday, the 17th inst., must be designated as a virtual "field day" in connexion with the Union, inasmuch as that was the occasion on which the first annual excursion was held. The destination was Selby, the weather delightfully fine, the party numerous and representative, and the whole affair a complete success.

Leeds was the centre at which the members from various parts assembled, and they were there taken in hand by Mr. J. Groisdale Coultas, the courteous Secretary of the Leeds Photographic Society. This refers to the first contingent, which were "dispatched" at 9.25 a.m. The later detachment followed at 1.22 p.m., and on arriving at Selby were met by those who had preceded them, and together boarded a special train, the destination of which was Cawood.

It was now ascertained that the party was upwards of seventy strong, and included members from Bradford, Leeds, Hull, Halifax, Pudsey, Yeadon, and Brighouse.

The run to Cawood was only a brief one, and the conversation on the way was, of course, one which required but little time for "development" under such favourable conditions. The detrainment was apparently regarded with much interest by the natives, who seemed to view the varied and vast array of photographic armament with commendable awe and wonderment.

There was no waste of time. Operations were commenced at once, and "shots" were flying about in all directions. No set plan of campaign had been arranged, for every operator was a power unto himself, and preferred to be his own general, with the view, no doubt, of out-generalising every other artistic operator. Hand and stand machines were quickly at work, mostly directed at a pretty bit of rural scenery with some cottages in the distance, and a picturesque and sloping bank touching a meandering stream further afield. One enthusiast in the party caught what should prove an interesting plate of a cottager sinking the bucket in the well. From an artistic point of view, Cawood Castle came in for the major share of attention, and the party was shown the ancient banqueting-hall, now used as a shippen, and the court-house, where court leets are still periodically held. It is said that Cardinal Wolsey was imprisoned here for a brief period, and the old place is now turned into a model farmstead.

Afterwards the party drifted on to the river, where several views were secured, with boats and barges in the foreground. Another detachment, however, oscillated in a slightly contrary direction, and expressed hearty approval of the home-brewed provided by mine host.

One of the prettiest pictures obtained during the day was that of the confluence of the Wharfe with the Ouse, and doubtless we shall see this in many a screen during the winter months.

It was delicious dawdling on the river banks, and enjoying the exercise

of our scientific skill, in such glorious atmosphere and sunshine; but everything must have an end, and marching orders were given for the station.

Selby was reached about six o'clock, and an excellent tea was provided at the Londesborough Arms Hotel.

After tea it was suggested that a little oratory would be an agreeable change, and, with his usual readiness, Mr. Percy Lund at once obliged. He remarked that he was not going to inflict a long speech upon them on this the first occasion of their meeting together in connexion with the Yorkshire Photographic Union, but the gathering, being the first of its kind, seemed to call for a few introductory remarks from himself. Proceeding, he said that, when a few months ago each of the Yorkshire societies had decided to venture upon the experiment of union with fellow societies, probably to the majority who were acting as delegates for their societies the union did not for a time appear to have any real or tangible existence, nor did its proposals seem within measurable distance of realisation; but, when the representatives of the newly constituted organization had met together in solemn conclave and got through the preliminary stages of constitution and outlined a plan of working, it was a source of congratulation for them to find that the seeds they had sown in faith had given rise to a vigorous plant, and that plant had put forth a flower in many ways.

In the first place they had had a most successful annual excursion that day, and the glorious sun, who played no secondary part in photographic work, had given them his warmest support. He trusted and they hoped that the flower would in due time bring forth abundant and good fruit, and that the Yorkshire Photographic Union would increase and prosper, and bring about innumerable useful results as a reward for the labour and energy that had been bestowed upon it. The lecture scheme had already become an accomplished fact, and the list of twenty-five gentlemen able and willing to speak on numerous subjects was in the hands of individual secretaries, so that when the lecturing scheme went round the movement would be felt throughout the country. Apart from the proposals already on the programme such as interchange of slides, &c., there were very important matters entitled to consideration.

He thought the Union should possess a first-class collection of pictorial photographs for the purpose of lending to societies and to the Geological Photographic Committee of the British Association, and to assist in bringing about the adoption of the metric system would be most beneficial, whereas at present such a confusion of systems existed. Those were only a few of many points to which attention should be devoted. Good service would have been performed by the Union if it did no more than bind together a number of individual societies scattered throughout the country, and foster an intelligent study and love of photography. For, whether in commerce, science, art, or architecture, the camera as a recorder was becoming almost as indispensable as the pen, and he believed the time would come when our children's children would receive at the same time and with their pencils and drawing boards a portable camera and a roll of sensitive film. If the Union did none of these things but encouraged photography as a hobby, it had established a right to exist, for, plunged as we were in the deep sea of commercialism in working and worrying for precious metals, photography might be likened to the loadstone which held us fast to nature and to that divine spirit which was behind all the truest and best things in the world.

Mr. Godfrey Bingley (Leeds Photographic Society) said they could not separate on that occasion without passing the warmest thanks to the Rev. A. J. Tweedale, who had kindly given them permission to photograph in the Abbey Church, and also to Mr. Wormald, of Cawood, for having generously allowed them to go unrestricted in any part of the grounds, and to Mr. Prosser for permission to roam over the bacon factory, and last, but not least, to Mr. W. N. Cheerman, a local photographer, who knew all about Selby and the Abbey. He proposed that their warmest thanks be given to those gentlemen he had named for the great kindness and help in that day's proceedings.

Dr. Hollingworth (Hull) warmly seconded the vote of thanks, and the members heartily accorded it.

Mr. Clough said he might mention that there were seven societies represented there that day, and in regard to the lecturer's list he would advise the secretaries, although only two lectures had been promised, to get as many as ever they could. He wished to draw the attention of secretaries to the fact that he would like a notification or some rough idea as to the number of lantern slides each society was prepared to send in to the judges, and as to the excursions an intimation of the most suitable day or any other suggestions.

The party were afterwards grouped and photographed in the grounds of the Londesborough Hotel, and then broke up, some leaving by the 7.10 and others remaining until 9.30. It was the universal opinion expressed that a more delightful outing and gathering could not have been experienced.

#### THE IMPERIAL DRY-PLATE WORKS.

It is seven years or more since we visited the works of the Imperial Dry Plate Company at Cricklewood. It was in the early part of 1892, and the first few gross of plates lay really packed for sending out. Indeed, we believe that the very first dozen half-plates which left the building were used by ourselves, and exceedingly fine plates we found them.

Since the year 1892 matters have progressed very rapidly at Crickle-



wood, which from nothing but a mere hamlet has developed into a very large and prosperous suburb indeed. A visit to the Imperial Company's works one afternoon last week enabled us to perceive that great additions have been made to those buildings since we first saw them. The frontage of the ground occupied by the works extends to more than 170 feet, with a depth of about equal dimension. The original dry-plate building has been added to on three sides, and there are separate factories for P.O.P. and bromide papers. Roughly speaking, the area of the Imperial Company's buildings has been multiplied some four or five times since our visit.

The activity of the engines and dynamos and the sight of a vast pile of plates ready packed for sending away were sure indications that the very greatest activity prevails at the Imperial Works. The success of the Company's sensitive preparations can hardly be wondered at, for one is constantly hearing them spoken of as exceedingly good and regular in quality. All the building work, electric lighting, and fitting up of the dry-plate, P.O.P. and bromide factories was carried out under the personal supervision of the managing director, Dr. J. J. Acworth, whose success has been thoroughly well deserved. Indeed it is when we contemplate the growth and expansion of the Imperial and other dry-plate firms in recent years that we become more than ever convinced of the firm and permanent hold which photography has obtained upon all classes of the community. Ever since our association with photography, now twenty years or more, we have been listening to occasional apprehensions lest photography should die out. And yet photographic manufactures were never in so flourishing a state as in the last few years.

#### A PHOTOGRAPHIC GARDEN PARTY.

It was a happy idea of our old friend, Mr. A. L. Henderson, to invite the members of the London and Provincial Photographic Association, a body in which he takes the keenest interest, and of which indeed he was the founder some seventeen years or so ago, to visit him at his house, Brimsdown, Middlesex, on Saturday afternoon last. The weather was beautifully fine, and the trees and fields, in their early summer tints of green, looked at their best and freshest.

Mr. Henderson's house, which is surrounded by some fourteen acres of land, broken up into a pleasant variety of smooth lawn, hayfields, flower and kitchen gardens, and plentifully sprinkled with trees and bushes, is of some slight historical photographic interest, as it was formerly occupied by the once well-known photographer J. E. Mayall, thrice Mayor of Brighton. We need hardly say that it has many objects of photographic value and interest, which were eagerly examined by Mr. Henderson's visitors in the course of the afternoon.

About thirty gentlemen responded to Mr. Henderson's invitation, amongst them being Messrs. A. Cowan, T. E. Freshwater, A. Mackie, Thomas Bedding, P. Everitt, S. H. Fry, — Fry, junior, A. W. W. Bartlett, J. E. Hodd, R. A. Hodd, R. P. Drage, H. E. Davis, J. S. Teape, A. J. Brown, J. A. Sinclair, S. C. Mote, and others. It was quite an old-fashioned "L. and P." gathering, but without the characteristic argumentativeness which usually prevails at formal meetings of the Association. Mrs. Henderson and Mr. and Mrs. Gray kindly assisted the host in receiving the guests, and refreshments were served on the lawn, where tea and supper were partaken of. Most of the party were provided with cameras, and many opportunities were availed of in the pretty grounds for taking groups and snap-shots. Visits were also made to one or two places of interest in the neighbourhood. The afternoon seemed all too short in the pleasant surroundings, amongst which Mr. Henderson diversifies his photographic work with pursuits of an agricultural and pastoral nature. At the end of a charming day Mr. and Mrs. Henderson were cordially thanked for their hospitality, and the members of the "L. and P." returned to town highly delighted with their outing.

## Our Editorial Table.

#### TUBOL.

We have received from the old-established firm of Ed. Liesegang, Düsseldorf, a sample of developer sent out by them under this name. The method of packing is unique, and will commend itself to the tourist and traveller for safety and convenience. The ingredients forming the developer are mixed in a stiff greyish paste, and enclosed in collapsible metal tubes, the same as artists' colours. For use the mixture must be diluted by addition of 50 parts of water for instantaneous exposures, and 70 parts for ordinary landscape work. As the paste retains its filiform shape when squeezed from the tube, it is easy to measure the quantity by length. About 2½ inches will be found sufficient for 2 ounces of developer, and a few minims of a ten per cent. solution of bromide of potassium should be added. The diluted developer will keep a considerable length of time. In use we have found it very efficient and free from stain, bringing up the image steadily with ample detail. We put it to a severe test by using some orthochromatic plates, which we know are several years old, and were gratified to find the negatives full of detail and free from fog.

The Bay State Photo Company, of 124, Hospital-street, Nantwich, send us a sample bottle of their combined toning and fixing bath, together with some prints toned in a similar solution some years ago, and which, though exposed to light, appear to have stood well. From the same source we have also received a sample bottle of a new one-solution developer—Developall. This is claimed not to stain, and to work well with plates and papers. The Company intend sending out 1000 samples to those applying for them.

Mr. C. C. VEVERS, of 54, Grand-arcade, Briggate, Leeds, sends us a sample of his new "Kepvel" preservative parchment envelopes. When repacking plates on tour, the amateur will find them very useful, as he can then carry his plates without fear of scratching or rubbing the film. For storing negatives they also have some advantages over the ordinary negative bags, as they are smooth, tough, and translucent, allowing the negative to be seen and recognised without the trouble of removing it from the envelope.

MESSRS. E. MARLBOROUGH & Co., of 51, Old Bailey, E.C., are issuing a decidedly useful little book on *Italian Self-taught*, by C. A. Thimmes, F.R.G.S. The correct pronunciation of this beautiful language is given, and amongst others there is a photographic vocabulary, whose only fault is its brevity. In paper covers the book sells at 1s., or in cloth, 1s. 6d.

Mr. PERCY LINDLEY, of 30, Fleet-street, E.C., sends us the first number of the London, Brighton, and South Coast Railway Company's *South Coast Quarterly*. It is said to be the first publication of its kind issued in England. Touring and topography supply its *raison-d'être*, and, besides many sketches and phototypes of scenes in the country, French and English, that is served by the Brighton Company, there are many interesting descriptive notes. The *South Coast Quarterly* will, doubtless, appeal to many photographers.

From the Scovill & Adams Company, of New York, we have received a handy little pocket-book on *The Half-tone Process*. The information given on the use of screens and diaphragms is very full and comprehensive.

*TRAITE Pratique de Photographie Stéréoscopique* is the title of a work on binocular photography by that prolific writer Mons. L. Mathet. It is published by Charles Mendel, Paris, and is in French. The theory and practice of the subject are fully dealt with.

PART II. of a *Reference Book of Practical Photography*, by Mr. F. Dundas Todd, Editor of the *Photo Beacon*, Chicago, has reached us. The matter appears to have been well selected and the photographer will find the little book reliable and informative.

#### CATALOGUES RECEIVED.

E. & T. Underwood, 130-132, Granville-street, Birmingham.

In sending us a copy of their latest catalogue, Messrs. Underwood point out that among the new goods now listed are the *Pacts*, a low-priced set, of good workmanship and finish, and having a rapid rectilinear lens, with iris diaphragm.

They rightly observe that there are many people who want to do a little photography without going deeply into it, and with them a rapid rectilinear lens is of greater consideration than many of the usual camera movements.

The *Field*, *Club*, and *Umbra* cameras are also listed, and the *Umbra* is now made for stereoscopic work, the half-plate being also available in the same instrument.

The *Salon* and *Royal* are two new high-class cameras, having a set of supplementary lenses for use with the rapid rectilinear attached to the *Umbra*.

Among the minor improvements in Messrs. Underwood's hand cameras that called the *Sphinx* is now fitted with patent handle sheaths, allowing two or more sorts of plates being carried and either used at will.

The catalogue is beautifully printed and contains reproductions of many fine photographs taken by Mr. Underwood and other gentlemen, and, as there are many practical hints on the uses of photographic apparatus and lenses, it should prove of very great service to amateur photographers and others.

#### PHOTOGRAPHISCHE OBJECTIVE UND OPTISCH-PHOTOGRAPHISCHE HILFSAPPARATE. 1899.

Carl Zeiss Optische Werksstätte, Jena.

We have just received the latest edition of the catalogue of photographic lenses and optical accessories manufactured by Messrs. Zeiss, and the excellence of its arrangement and the completeness of its detail leave nothing to be desired. Compared with the previous edition we notice three new features of special interest. These are Dr. Rudolph's Planar Lens



(Series Ia), which is sent out in foci ranging from 2 to 61 cm.; a new set of diaphragms with multipartite apertures for process work; and an improved form of iris shutter with adjustable speed-regulator. The present catalogue should be of great value to the users of Messrs. Zeiss' justly celebrated lenses.

J. Roeder, Frankfurt am-Main, Bockenheim.

This catalogue is printed in two languages, French and German, and gives illustrated particulars and prices of photographic apparatus of Continental manufacture.

## News and Notes.

PHOTOGRAPHIC CLUB.—June 28 1899, at eight o'clock. "Notes on Some Novel Photo-mechanical Printing Machinery," by Mr. H. Snowden Ward.

MESSRS. MATTHEWS & CO., gold and silver sweep dealers, inform us that they now have premises in working order for bullion and assay offices, at 42, Great Queen-street, Lincoln's Inn, London, W.C.

THE AUSTIN-EDWARDS MONTHLY FILM NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Miss Ivy Weston, 23, Sandgate-road, Folkestone, for her negative, *Portrait of Child*.

MESSRS. ROTHWELL & ROTHWELL, commercial photographers, trade photographic printers, and enlargers, publishers of lantern and stereoscopic slides, &c., have removed to 18, Norfolk-street (opposite G.P.O.), Manchester.

THE Photochromoscope Syndicate, Limited, inform us that, in consequence of the expiration of their lease of 121 and 123, Shaftesbury-avenue, W.C., from June 10, 1899, their business will be carried on temporarily at the works, 28, The Pavement, Clapham Common, S.W.

MESSRS. RAINES & CO., photographic enlargers, &c., of St. Mary's-road, Ealing, W., inform us that, notwithstanding the recent destruction by fire of a portion of their premises, they are able to continue their work as usual, and that all orders are being executed without delay.

KODAK, LIMITED.—The Directors of Kodak, Limited, have declared an interim dividend on the Company's preference issue for the quarter ending June 30, 1899, at the rate of six per cent. per annum, and on the ordinary shares at the rate of ten per cent. per annum for the same period, which dividends will be payable on or after the 1st prox.

THE cycling section of the South London Photographic Society will hold their second annual midnight ride to Brighton on the 24th-25th inst., starting from Streatham Corner at 12.30 a.m. The headquarters are at 53, London-road, Brighton. Members and their friends are desired to communicate with the cycling captain, Mr. Howard Ealer, 4, Queen's-road, Peckham.

THE Electrolytic Salts Company have received a report on the "process" of extracting gold from sea water. The professor whom the directors employed reports that the process was fraudulent. The directors are said to have recovered a considerable sum from the originator of the swindle, which, together with the sale of the machinery, &c., has realised enough to pay 20 per cent. dividend to the stockholders.

MR. GEORGE P. GIBSON, chemist and photographic dealer, of West Church-street, Buckie, N.B., writes: "I noticed in your issue of July 1, 1898, a list of persons having dark rooms for use of the public, tourists, &c., and who are also dealers. You might insert my name. Buckie is a good place for the amateur photographer visitor. It is situated on the Moray Firth, with good bathing, golf, &c. A good many visitors come here from all parts."

MR. RICHARD KEARTON is in Scotland gathering material for another natural history volume. His method, of course, is to study nature on the spot alike with camera and pen. He has been able, in this way, to collect into his books a singularly interesting series of pictures. To the general reader, who can always understand a picture, these have, no doubt, been a great attraction. Mr. Kearton's new volume will, in some degree, be a sequel to a previous one dealing with British birds' nests. It will be ready in the autumn.

THE Paget Prize Plate Company had their annual outing on Saturday last, a most enjoyable day being spent at Bournemouth, which was reached by special train from Watford at 9.15 in the morning. As this necessitated a somewhat early start, breakfast was served to the whole of the staff on their arrival, and, thus fortified, they betook themselves to enjoy the many and varied opportunities for diversion which Bournemouth affords. The return journey was commenced at 7 p.m. from Bournemouth, and, after a pleasant run, Watford was reached at 11.30 p.m.

THE Monroe Camera Company, of 2, Old-street, Goswell-road, E.C., write: "We regret to say that, in our catalogue, as well as in our advertisements, Lloyd's Rotary Trimmer has been listed wrongly, and we should be obliged if you would change it as below, and give due publicity in your columns to it, as we do not want to run the risk of being credited with the intention of defrauding the public:—No. 0 Lloyd's Trimmer at 8s. 6d., cuts nothing larger than 5½ inches square; No. 1, at 12s., 7½ inches square; No. 2, at 15s., 8½ inches square; No. 3, at 18s. 6d., 10½ inches square.

THE names of the prize-winners in the Warwick Monthly Competition for June are: 1st prize, 10L, Mr. R. S. Webster, 60, Princes-street, Edinburgh, *A Canny Scot*; 2nd prize, 5L, Miss Ivy Weston, 23, Sandgate-road, Folkestone, *Three Child Studies*; twenty prizes of 1L each, Misses Janet Reid and Winnie Halett, Messrs. T. F. Brogden, T. U. Simonson, C. J. Allin, E. A. Price, C. Metcalfe, R. A. B. Bennett, T. H. Baker, W. Baldwin, Cecil Gethen, H. E. Watkin, Alfred Bainbridge, G. Adams, J. Williams, J. Terras, A. B. Carr, J. W. Wharton, Q. O. Grogan, and H. M. Hallsworth.

ALLEGED FRAUDS.—At the Gainsborough Police Court on Friday, Robert Audens and Fredrick Hart, of Grimsby, described as photographers, were charged with larceny by trickery. From the evidence of Robert Morris, a farmer, of Scotton, it appeared that, on April 25 last, the prisoners persuaded him to have a photograph taken of his house, and a family group. He paid them 14s., and they promised to send on the photographs in nine or ten days, but he heard nothing further from them, and, not having their address, he could not communicate with them. When prisoners were arrested, they had in their possession negatives and a number of rough prints of the photographs, and they said that, owing to the weather, they had been unable to complete the photographs. Superintendent Eagley stated that there were likely to be further charges preferred against the prisoners, and they were remanded in custody.

X RAYS ON THE BRAIN.—A paper was recently read by Mr. W. B. Delamatre before the Illinois Homoeopathic Association of Chicago on the use of X rays in the diagnosis of injury to the skull and in brain disorders. He found it necessary to take photographs, as they enable the location and extent of the fracture or other injury to be discovered with much greater exactness than a mere observation with the vacuum tube. In some cases of insanity a diagnosis by means of the X rays had been found of assistance either in showing abnormal conditions, rendering operation useless, or indications that might render it hopeful. Circumscribing thickness of the skull was readily indicated by means of the rays, and tumours and abscesses had also been detected by the same agency. In the case of blood clots, as they do not differ greatly from the surrounding tissue, they could not be identified, but degeneration of the brain tissue, which generally alters the density of the brain, can, according to Mr. Delamatre, be diagnosed, although we should have thought that such diagnosis would only be possible in cases in which the disorder had reached an advanced stage.

## Patent News.

THE following applications for Patents were made between June 5 and June 10, 1899:—

SHUTTERS.—No. 11,600. "Improvements in Photographic Shutters." J. E. THORNTON.

ANIMATED PHOTOGRAPHY.—No. 11,997. "Improvements in Animated Photography." R. W. PAUL.

FOLDING CAMERA AND SHEATHS.—No. 12,058. "Improved Folding Photographic Camera and Photographic Sheaths or Carriers." A. L. ADAMS.

FILMS.—No. 12,152. "Improvements in Photographic Films." G. MACAIRE.

CAMERAS.—No. 12,180. "Improvements in and relating to Photographic Cameras." Communicated by J. G. Siegrist. Complete specification. J. C. FELL.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
24.....	Ashton-under-Lyne.....	Excursion: Llangollen. Leader, Chas. Lord.
27.....	Hackney.....	Open Night
27.....	Royal Photographic Society ..	Slide at 66, Russell-square, W.
28.....	Kingston-on-Thames.....	Excursion: Kew Gardens. Leader, A. Hill.
28.....	Photographic Club.....	Notes on some Novel Photo-mechanical Printing Machinery H. Snowden Ward.
29.....	London and Provincial.....	Annual General Meeting.
29.....	Oldham.....	Demonstration. T. Widdop.
July.		
1.....	Borough Polytechnic.....	Excursion: Sewardstone. Leader, A. Bedding.
1.....	Darwen.....	Excursion: Jumbles, Turton.

### ROYAL PHOTOGRAPHIC SOCIETY.

JUNE 20.—Technical Meeting.—The Right Hon. the Earl of Crawford, K.T., F.R.S. (President) in the chair.

#### RETOUCHING.

MR. REDMOND BARRETT read a paper on "Retouching," in which, after a brief review of the origin and progress of that art, he described the different methods used prior to the general adoption of the lead pencil, and discussed the systems laid down as the best means for carrying out the work by the various writers on the subject, examining them from the artistic and common-sense standpoints. He then proceeded to deal with the application of retouching to the various classes of negatives, including portraiture and architectural and landscape work, &c., and the means of legitimately forming or emphasising artistic effects. There were many, he said, who could not, or would not, recognise the legitimacy of retouching, but he regarded it as an essential in the production of successful portraiture, the object of the retoucher being to work in close sympathy with the operator, and to help him to carry out the artistic notion to which he first gives existence in the shape of a negative. Retouching was first introduced in the old wet plate days, when it was the custom to stipple out the blemishes in the negative with blue or neutral tint water colour; but the adoption of the lead pencil imparted a greater variety of possibilities



to be limited ultimately by the artistic feeling of the worker. This limitation was very ill-defined, and was shifted about in the most reckless manner to suit the temperament of the artist, or of the photographer employing him, or the whim of the customer. Various writers had laid down many and contradictory methods as being the only correct ones to be used in working; but he could not see that the results were artistic or natural or calculated to produce sound portraiture. There should be no such thing as a regulation touch; the shape and quality of a touch should be entirely governed by the shape and appearance of the blemish, and the touch should not be too positive and defined or the quality of the skin would be lost. Regulation touches would give what is called texture, but they would not give skin, and skin is a very important factor in every portrait. In the prevailing methods of working no attention was paid to this point, no thought was given to it—strong men, weak men, old ladies and young ladies, and even children, were all treated alike—there was only one skin on tap and all must have it. Delicate detail, fine modelling, artistic light and shade, were swept away by the retoucher for the sake of obtaining the polished surface so dear to him, resulting in cold, hard, and expressionless faces. Men were as susceptible as the gentler sex to the retoucher's flattery, and he hid himself on many occasions been called upon to completely alter a gentleman's nose, and even to reduce the beard in the back of a male sitter in whom increasing weight had marred the symmetry of former days. He thought that if retouchers exercised more judgment in their flattery, and brought more skill and thought to bear upon it, a better standard of work and opinion would be established, and one would not so often hear it said, with justice, that the best likeness of Mr. or Mrs. Snowden was taken by an amateur friend in his back garden, the reason being that, although it was a very bad photograph, it had not been retouched. In landscape and architectural work it was often possible to add an effect of light and shade not in the negative, or to emphasise an effect not already sufficiently powerful to assert itself, by washes of colour, papering the back of the negative, stumping in lights, &c. He recommended the adoption of the study of engravings, and said that by making a hobby of restoring engravings and mezzotints he had acquired a feeling for artistic beauty which was invaluable in his work as a retoucher, to say nothing of the attendant pleasure of the occupation. He had often wondered why amateurs, especially ladies of artistic tastes, had not gone in more seriously for retouching. He knew ladies who had "beautiful" likenesses, and who yet declared that they had not a likeness of themselves which they could leave to their family, and he expressed the opinion that there was a lot of money waiting for the professional or amateur who would supply that which should be at once a good photograph and a good likeness. A negative, he went on, held in itself an impression of the texture of the real skin, and the work of the retoucher would be made much easier, and would be infinitely better, if his touches were not so vivit and aggressive as to obliterate it. The slightest touch of the pencil would often soften a line so as to do away with the unfortunate expression which the majority of sitters assumed when they looked at a camera, and that, too, without taking away the natural characteristics of the face. If learners of retouching were taught to think, and not merely to make certain marks on the negative as a means of removing blemishes, their time would be saved and their work would be immensely improved.

The PRESIDENT regarded want of thought as the great fault of modern retouchers. He had himself made experiments in lighting, using a wax head, obtained from a hairdresser, and the result was a close approximation to the highly retouched photographs exhibited in the shop windows, i.e., the photographs showed nothing like skin and was devoid of expression. The retoucher, too, seldom had an opportunity of studying the original, and consequently worked more according to his idea of what the sitter ought to be than what he was really like.

Mr. REDMOND BARRETT said the loss of likeness was caused by a too lavish use of the pencil, and that the best result was always arrived at by the least amount of work; at the same time, he had never seen a negative which could not be improved by retouching, even though only a few touches were necessary.

Mrs. SNOWDEN WARD asked what description of pencils were recommended?

Mr. BARRETT said the best degree of hardness or softness depended, to a great extent, upon the peculiar touch of the user. Personally, he preferred a No. 3, a very safe pencil, with which almost anything could be done. With hard leads there was a tendency to increase the amount of work, and therefore there was a danger of overdoing it. The major blemishes should first be removed, and then, if the next lot in order of badness were taken out, little cure would be required. Freckles were quite easy to manage, but to absolutely fill them up would ruin the photograph, as it would make white spots. For landscape work the pencil was not suitable, and the best method was to use washes of colour, or to work on *papier minéral* fixed to the back of the negative.

Mrs. Gibbs, Dando and Snowden Ward took part in the conversation which ensued, and the proceedings closed with a hearty vote of thanks to the lecturer.

#### COMING EVENTS.

This was the last meeting of the session. The Society is now removing to its new home at No. 66, Russell-square, W.C., and its entry into occupation of a house of its own will be signalled by a *soirée* to be held on Tuesday next, June 27, at eight p.m., when the President and Council will receive the Fellows and members and their friends, together with any members of the affiliated societies who may be able to be present.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 15.—Mr. A. Haddon in the chair.

Mr. A. L. HENDERSON brought forward an interesting failure bearing upon the efficiency of the back-d plate. The negative was taken at Monte Carlo on a plate backed with a plain caramel preparation, which in turn had been covered with a piece of yellow paper, over about a third of the area of the plate, where the dark-slide springs would otherwise come into contact with the glass, the object, of course, being to prevent the stuff from sticking to the slide. He had used the same sample of caramel for twelve months at least,

and this was the first time that anything peculiar had occurred. Where the yellow paper had been the image was perfect, but where there was only the backing of caramel the negative appeared to be light-fogged. Could there have been some fluorescent action in the caramel, he asked as the plates had been backed for some length of time? The paper which supplemented the backing was that in which the plates were wrapped, and was of a dark orange colour.

The CHAIRMAN thought that, if fluorescence entered into the question, the effect would be a general action wherever the backing was present. Here, however, there was a distinct demarcation between the parts backed by the yellow paper and caramel together and the caramel alone.

Mr. H. VIVIAN HYDE said he had backed half a dozen plates in a similar manner, putting a piece of red paper of a smaller size in the middle. The parts of the negative backed only by the caramel were denser than those having the additional paper backing, a distinct outline showing. His idea was that the backing of caramel without the paper was not completely effective, hence the difference.

Mr. WALTER D. WELFORD read a paper upon

#### THE PAST AND THE COMING YEAR.

His remarks were based upon the minute-book records, and formed an epitome of the discussions which took place throughout the year on a few of the more prominent topics, such as printing methods and matters, negatives and films, developers and developing, toning baths and solutions (with the attendant questions of permanence and sulphur toning) and light and exposure. Mr. Welford awarded the palm for thoroughness of discussion and investigation to the subject of "Exposure in Shadow versus Diffused Light—Which is Longer?" but, on the whole, would describe the feature of the year to be "Toning," a subject which received a great deal of attention. As regards the future year, could not some idea be gleaned, he inquired, from the epitome here presented? Why was it that opinions were found to differ so widely, that we want to know this, that we do that, or cannot accept such-and-such a theory? The answer to this supplied an aim for the coming season, viz., a little painstaking investigation. There were many problems awaiting solution, and he asked that our motto for the coming year should be "Advance photography." In so doing we should further the interests of the Association and of ourselves, and so advance all along the line.

#### PHOTOGRAPHIC CLUB.

JUNE 14.—Mr. Hans Müller in the chair.

The ruling of the taking and viewing screens for the Joly process of photography in natural colours, upon which Mr. J. W. Mason addressed the last meeting, was again raised, special consideration being given to the difficulties which prevent the ruling of more than some 240 lines to the inch. It appeared that the running tendency of one of the liquid colours with which the ruling was done stood in the way of greater perfection being attained in this particular, but Mr. SNOWDEN WARD suggested that films of gelatine, suitably stained with the three chosen primaries, and piled up in a consecutive manner—red, green, blue, and so on—might be compressed into blocks, and thin cross sections cut away in the microtome. These sections, supported on glass plates, would present a series of rulings of a fine character, which might be used for the purpose under discussion.

Mr. G. W. TOTTEM raised the question of a safe light for the handling and development of isochromatic plates.

Mr. F. A. BRIDGE was averse to the use of direct light at all in his dark room, and arranged so that the light reaching the plate should be reflected light only, the rays passing the coloured glass to a white or yellow screen, and thence to the dish. His objection to isochromatic plates was on account of the poor light which they allowed one to use, but it was surprising how much more light could be employed of this reflected nature. He alluded to artificial light, which was, in his opinion, the best light to use on account of its constancy. He preferred not to use red glass at all if he could help it, and named Heile's photographic orange as capital stuff for dark room illumination, and one which he always used. By a little trial it should be easy to pick out a very serviceable glass, for glass was apt to vary in quality from a photographer's point of view, though in appearance it might be all that was required.

Mr. W. R. STRETTON mentioned that he knew of a case where Cadett's Spectrum plates were developed by the light of an ordinary ruby lamp burning low. He had developed isochromatic plates and rapid spectrum plates himself by the light of a ruby lamp, covered with canary medium (fabric), the plate being about a yard away, with no direct light falling upon it. There was no fog which could be detected.

Mr. FRANK HAYS always used the orange light of his Perfection lamp, made by Benham. The lamp was turned away, and the plate covered.

**Hackney Photographic Society.**—June 13, the President (Mr. W. Fenton-Jones) in the chair. The excursion reports and announcements showed that in this respect the Society was as flourishing as in others. In the monthly excursion competition marks were gained by Messrs. Selfe, Westcott, Stean, Gosling, and Hunt. A representative of the Vibe Camera Company showed one of the firm's new hand cameras, priced at 11. 18s. The chief features of the instrument were the method of changing, and the fact that a large number of plates or films could be carried. The size of the picture was four-and-a-quarter inches square, and plates of any size below this could be used if required. The chief item of the evening was a most interesting lecture by Mr. W. RAWLINGS on

J. W. TURNER, R.A.,

in which he observed that there was a natural desire to know something of the life history of men of mark; but, apart from the fact that about some famous men very little was known—as, for instance, Shakespeare—a search in that direction was often very disappointing, because it was often found that their lives differed very little from those of ordinary persons; and, again, genius



was often allied with eccentricity, and a study of the lives of some men of genius would reveal faults of character very disappointing to those expectant of special excellence in all things. To a certain extent this was true of Turner. The lecturer then sketched in detail Turner's life from his boyhood upward, and showed that Turner's aptitude for art revealed itself at an early age. He was the son of a barber in Maiden-lane, Covent Garden, and, in spite of his surroundings—or, as Hamerton considered, by reason of them, he rose to be one of the greatest of landscape painters. In the course of his artistic career he painted an enormous number of pictures covering a very wide range of subject and treatment. Mr. Rawlings recommended, as specially worthy of study by photographers, Turner's *Liber Studiorum*, a series of etchings, of which seventy-one were published.

**West Surrey Photographic Society.**—At the last weekly meeting of this Society, the Judges' awards at the late Exhibition, and in the Lantern-slide Competition, were given by the President of the Society. One went to Mr. Meadowcroft, for a seascape; one went to Mr. Hoad, for a landscape; while the Hon. Secretary (Mr. W. H. Wilshire) took, as well as an award for landscape, the winning award in the Lantern-slide Competition with four slides of especial merit, and on which the President especially congratulated him.

## Correspondence.

\* \* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### THE COPYRIGHT ACT.

To the EDITORS.

GENTLEMEN,—I thank you for your articles on the proposed Copyright Amendment (?) Act now before the House of Lords. I quite agree with you that, if carried in its present form, it will inflict great hardship upon professional photographers and publishers, and no time should be lost in getting up agitation against it. Permit me to suggest that your firm are the most likely people to send out a form of petition against the Bill to all the professional photographers in the United Kingdom, asking for signatures.

Of course, this will involve some trouble and expense; but as it is one of the features of modern journalism to embark upon any enterprise that is calculated to lay their subscribers and patrons under additional obligations and appreciation of the services rendered to the profession by your JOURNAL, it would pay you indirectly. But, even if you are not inclined to incur the expense, I am sure thousands of photographers would gladly subscribe the small amount necessary to recoup you.—I am, yours, &c.,

J. R. BECKETT.

Photo Studio, Fern Bank, Yeovil, June 19, 1899.

[We are obliged to our correspondent for his suggestion. Such a matter, however, is more properly to be dealt with by representative institutions. It will be seen by the following circular that the Copyright Union and the Royal Photographic Society have the matter in hand.—Eds.]

"ROYAL PHOTOGRAPHIC SOCIETY.

"66, Russell-square, W.C.,

"London, June 19, 1899.

"The Photographic Copyright Union have represented to the Royal Photographic Society the urgent necessity for an expression of opinion of the Society and others interested in maintaining the present status of photography as a fine art, with reference to the new Copyright Bill.

"You are earnestly requested therefore to attend a meeting at 66, Russell-square on Wednesday, 21st inst., at 8 p.m., the Earl of Crawford in the chair, when a resolution will be proposed as to the position of photography in the Artist's Copyright Bill now before Lord Monkswell's Committee in the House of Lords.

"J. WATERHOUSE, Colonel I.S.C.,

"Hon. Sec P.R.S."

### A PARTNER WANTED.

To the EDITORS.

GENTLEMEN,—I trust you will forgive the liberty I have taken in writing to you; but, as this is a matter of business, no doubt you will kindly excuse me. You will see by this letter that I am a photographer and am wanting a partner, so I thought you may be able to help me, or, if not, you may know of some one who could; if so, you would do me a great favour by handing this letter to any one you may know of.

I am an Englishman and have been in this country for ten years, and have been in business for myself for five years, having bought out a man who had been here some years. During the time I have been here I have done well. There is only one other photographer in this town, but, as his work is inferior, I find him an advantage, as he keeps a good man away. I commenced learning my profession with one of the leading firms at Plymouth, Devon, and I was there for three years before coming out West. Now that Calgary is fast going ahead, I want some one in with me so that I shall be able to extend business. I would

prefer taking a young man with a fair knowledge of the work, although I would not mind taking a good amateur, providing that he is willing to work and improve.

The net profits last year were \$3500, and this was when the country was suffering from a general depression. There has now been quite a change, owing partly to the extension of the Canadian Pacific Railway Company's works, and also the gold rush North made no small difference. The capital required to purchase a half share would be 4000. If you know of a young gentleman who is willing to work and keep steady, I am sure that in a few years he would not regret coming out West.

Trusting that I shall have the pleasure of hearing from you,—I am, yours, &c.,

J. M. LOWNDES.

Calgary, Alberta, N.W.T., Canada, May 20, 1899.

[We often have applications from young photographers desirous of engaging in business abroad. The foregoing letter seems so straightforward that we have no hesitation in giving it publicity, with the view of bringing it to the notice of likely candidates for the partnership.—Eds.]

### THE MUTOSCOPE.

To the EDITORS.

GENTLEMEN,—In one of your editorial paragraphs in your issue of the 16th inst., where you refer to the dividend paid by the British Mutoscope and Biograph Company, you very appropriately put the question, "Why do not some of our home manufacturers have a 'cut in' at the latter branch (The Mutoscope), we wonder?"

If you can see your way to insert the following by way of a supplement to your question, I have no doubt but many more will wonder as well as yourselves.

Before the above Company took the field, I invented and protected a mutoscope far superior to anything in that line yet brought out, and yet, for want of men of capital and enterprise to place it in the field, it is held in abeyance. I have built a crude model, which has been seen by one of the leading photographers of London, and by gentlemen in Glasgow (including opticians), who have pronounced it the best among mutoscopes, notwithstanding its home-made construction.

The pictures are not paralysed, as in other mutoscopes, but are absolutely steady, while the illusion of a living picture is perfect.

With the above to supplement your question, one may well wonder at no "cut in" being made for a share of the good things now going in dividends.

Thanking you in anticipation for space accorded,—I am, yours, &c.,

THOMAS ANSBORO.

277, Swanston-street, Bridgeton, Glasgow, June 17, 1899.

[Perhaps the publicity given to our correspondent's letter will be the means of inducing some enterprising manufacturer to inspect the model with a view to taking it up. Photographers and opticians are possibly not the best judges of the chances of commercial success which a mutoscope may possess. We heard some time ago that an English Company with a capital of 30,000*l.* was about to put mutoscopes on the market.—Eds.]

### IN REPLY TO "FREE LANCE."

To the EDITORS.

GENTLEMEN,—Evidently "Free Lance" is still in the archaic stage of photographic art, and like the child, left to draw for its own amusement, represents in profile only, the objects he wishes to delineate. Our critic cannot conceive of a point in motion impressing a plate in the camera with anything but a line, consequently foreshortening is excluded from his conception of photographic representation, and horses in gallop must be photographed broadside on. In reply to my second query "Free Lance" says he "should not attempt to show that every part of a horse in gallop moves at uniform velocity, for they do not." "Free Lance" may find part of the solution of his conundrum in this admission. With wit on a par with the strength of his criticism, he says "the fetlock might be looked upon as the portion whose progressive motion at times was slowest," and suggests "the fetlock of a cart horse rather than a race horse for manifestation of hair." Well, "Free Lance" chose the speed of the animal. If he backs horses, which only move half an inch in  $\frac{1}{100}$  second, I am not surprised at his want of success.—I am, yours, &c.,

P. EVERITT.

### THE NATIONAL PHOTOGRAPHIC AND ALLIED TRADES' EXHIBITION, 1900.

To the EDITORS.

GENTLEMEN,—Will you kindly permit me to announce, through the columns of your valuable JOURNAL that the second trade exhibition of photographic and scientific apparatus and sundries will be held early next year. The Portman Rooms, Baker-street, London, W., have again been secured, and the Exhibition will open on Friday, April 27, and close Saturday, May 5.



Arrangements have been made for increased space, and some thirty or more stalls, in addition to the spaces occupied last year, will be available for exhibits. The entertainments, lectures, and musical arrangements, which proved so attractive on the last occasion, will be repeated, and special attention is being given to this department in order to make the Exhibition, if possible, even more attractive to the outside public. The magnificent suite of rooms are specially adapted to a display of technical apparatus, and the Portman Rooms are easily accessible from all points of the metropolis. Any suggestions from your readers will be much appreciated, and, if practicable, will probably be adopted.

Most of the firms who exhibited last year have already intimated their intention to again take space, and several other firms have also expressed a desire to be represented. The prospectuses and application forms for space will be issued very shortly, and spaces will be allotted strictly in rotation as applications are received, the only exception being that former exhibitors will have first refusal of the spaces previously occupied by them.

I trust that an early announcement of these dates will prevent clashing with any other exhibition, and that exhibitors will thus be free from the inconvenience of having two displays to attend to at the same time. It is of the utmost importance that intending exhibitors should reply to the prospectus immediately upon receipt of same, in order to avoid disappointment.—I am, yours, &c.,  
pro ARTHUR C. BROOKES, Secretary.

B. C. P.

15, Harp-alley, Farringdon street, London, E.C., June 20, 1899.

## INTERNATIONAL EXHIBITION, PARIS, 1900.

To the Editors.

GENTLEMEN,—In reply to my application for space to exhibit at Paris, 1900, I received the following reply, dated August 15, 1898:—

"I beg to acknowledge the receipt of your application for space in the British Section of the Paris Exhibition, 1900, and to inform you that it will receive due consideration," &c.

After due consideration the following was forwarded to me:—

"In reply to your letter of the 12th inst., I beg to inform you that, in consequence of the limited space available for a display of photographs in the British Section of the Paris Exhibition, 1900, it has been decided to form a collective exhibit of photographs. This collective exhibit will be made up, to a large extent, of selections from the Autumn Exhibitions of the Royal Photographic Society and the Camera Club. Those who have made application for space and do not send specimens of their work to these Autumn Exhibitions will, if the Committee consider it necessary, be asked to submit a few specimens of their work, in order that a selection may be made from them for the Paris Exhibition.—I am, yours," &c.

Now, I worked for the following International Exhibitions: Vienna, Brussels, Lyons, and two Paris; but in neither case did I hear of the exhibits having to be submitted to a special committee; on the contrary, each applicant had free permission to exhibit his own choice; only, if the application for space was more than the allotment from the Exhibition Committee, the space applied for was cut down.

But here one has to depend on the Royal Photographic Society and the Camera Club. Who are they? Amateurs mingled with some scientific men, good men, too, but who ignore all professional photographers.

I, as a professional, was under the impression that, in this case, I should not be interfered with—*Impressionism*—and I wonder if the Paris Exhibition is promoted to further the amateur or the professional? Another question: If the space is limited, why is a selection made from photographs whose originators have not applied for space at specified time? Or must I conclude that this collective exhibit will only compete for one award, and that the single individual is not allowed to take his own chance?

And why should I show my intended exhibit beforehand, to give others the idea to copy me?

What is your opinion? I should be most pleased to hear your interpretations of the above, as you are more *au courant* with photographic life, whereas I am not personally acquainted with many professionals.

An enlightenment through your valuable paper may be of great benefit, not only to me but also to other intending exhibitors.—I am, yours, &c.,

SILVER MEDAL, PARIS INTERNATIONAL, 1889.

[We believe that the joint Committee of the Royal Photographic Society and the Camera Club is charged with the duty of selecting a thoroughly representative collection of non-competitive work for exhibition at Paris. The matter will not be taken in hand until the autumn. What course the Committee will pursue in making the collection we cannot tell. It is perhaps regrettable that individual exhibits are not invited for the Paris Exposition, but it is to be hoped that every facility will be given to those whose work is good enough to form part of a representative display to be included among the exhibitors.—EDS]

### PHOTOGRAPHS REGISTERED:—

- E. B. F. Fagge, 1, Friar School-lane, Roth-ster.—*Photograph of Ancient Grace Cup.*  
H. A. Marlee, 16, Waterloo place, Sunderland, Durham.—*Two Photographs of the Right Rev. Brook-Foss Westcott, Lord Bishop of Durham.*  
A. J. Ashbolt, 10, Exmoor-road, Southampton.—*Two Photographs of Miss Greta Williams, and Photograph of Miss Greta Williams and Miss Teresa Williams.*

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

H. M. MACHHEAR.—It is against our rules to give recommendations of the kind you ask for. We suggest that you procure our ALMANAC for 1899, in which almost every make of hand camera is figured and described. This should enable you to select an instrument fulfilling your requirements.

DISCOLOURED PAPER.—A. BRIGGS says: "I have a quantity of —'s P.O.P. which, with age, has become discoloured, and this discolouration shows in the prints after they are toned and fixed. Can you tell me of any means of preventing this, as I have a large lot of the paper which I bought as a 'job lot'?"—If the paper is discoloured as stated, there is no remedy.

LUBRICANT.—REX says: "I am using a lubricant recommended in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC (alcohol and Castile soap) for albumen paper. Can you please tell me of any other which would produce a better gloss on that paper?"—We know of no better lubricant than that given. The object of the lubricant, however, is not to give gloss, but to enable the print to pass easily over the burnisher. The gloss depends upon the burnisher, not the lubricant.

YELLOW STAIN ON NEGATIVE.—J. HUGHES says: "A negative has been brought to me from which a bromide enlargement is required. About one-third of its surface is covered with a deep yellow stain, presumably from imperfect fixation. Will you kindly inform me how the stain can be removed; also if imperfect fixation is the cause? The negative was taken about three years ago."—Under the circumstances we do not think the stain can be removed. An immersion in a fresh solution of hyposulphite of soda for a few minutes might be tried, however. Probably imperfect fixation is the cause of the stain, but we could not say for certain without seeing the negative.

FACTORY ACTS.—P. R. O. writes: "At my printing place I have six female assistants, a man, and two lads at work printing and mounting. I have been told that the place comes under the Factory Act and the young people must have a half-holiday a week, and I must be subjected to the other inconveniences of this abominable Act, but I don't believe that photography comes under it. Can you tell me if it does?"—Certainly it does. Why should there be any exemption in photography more than there is in any other business? The Act was framed to protect young persons from being overworked, and to secure for them some little time for leisure or recreation, also proper places to work in.

PORTRAIT.—G. F. writes: "1. Can a ten-inch objective, such as is supplied with Hume's Cantilever, be any use for studio work? 2. Is P.O.P. suitable for opaline work, and, if so, what strength and temperature of gelatine solution is necessary? 3. What is the best preventive of blisters (which appear after fixing) which occur on collodio-chloride paper?"—In reply: 1. Yes, but it will probably require to be stopped down. 2. Yes; rather weaker than is used for albumen paper. The temperature should be such as will just keep the solution quite fluid. It is not desirable to use it much hotter than will suffice to do that. 3. There ought to be no blisters with the paper if it is all right. Some have recommended putting the prints in a weak solution of alum, and then well washing prior to toning, when the paper is prone to blisters.

MOUNTING ENLARGEMENTS.—DEXTROSE says: "I have a considerable number of 12 x 10 enlargements to mount on India-tint plate-mark mounts, and have been bothered very much when mounting by the edges curling up especially after they are dry. I use a simple starch paste, damp the enlargement first by rubbing the back with a wet sponge, then allow it to lie for a minute and apply the starch and mount. I don't know if this is the usual method of procedure, but I believe most professionals use Glenfield starch simply. Can you give me any hint how to prevent the edges curling?"—There may be several causes for the trouble. The prints may be made too wet, to begin with, the starch paste too thin, or it is not applied thickly enough at the edges of the prints, or they are not pressed in sufficiently close contact with the mounts. Glenfield starch is a good one, but any other good starch will answer. See that there is a good coating of the starch on the extreme edges of the prints and that they are well rubbed down when mounting.

AIR BUBBLES ON PRINTS. F. RALPH says: "I enclose a print on P.O.P., which you will see is much discoloured and marked with air bubbles. This seems to occur in the washing water between toning and fixing. I have been troubled about this for a very long time, but cannot locate the cause. I have a suspicion the water used, which is from a spring well, is unsuitable for washing gelatino-chloride paper. Perhaps I ought to mention, the makers of the paper advise us, the toning bath or washing water is where to find the cause of the trouble, but I have satisfied myself the toning bath is all right; but how can I test the water?"—The markings are clearly due to air bubbles adhering to the paper, either in the first washing, by preventing the water having free action in removing the free silver, or while in the toning bath, and thus causing uneven toning. The remedy is to see that no air adheres at any stage of the work. We do not think the water itself has anything to do with the trouble. This may, however, be tested by treating one batch of prints with the spring water and a corresponding one with river or rain water.



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## EX CATHEDRA.

It was not to be expected that the meeting called, at one day's notice, for last Wednesday week by the Royal Photographic Society to protest against the attempt now being made in the Copyright Bill at present before the House of Lords to exclude photography from the legal enjoyment of the status of a fine art which was conferred upon it in the year 1862—it was not to be expected that such a meeting, fixed, too, for a midsummer evening, would be a very large one; nevertheless, when Lord Crawford, President of the Society, took the chair for the first time in the meeting-room of the beautiful and stately new house of the Royal Photographic Society, he was well supported by some of the foremost photographers of the day. We noticed amongst those present Mr. Alfred Ellis, Mr. Lyddell Sawyer, Mr. Warwick Brookes, Mr. William Grove, Mr. W. E. Downey, Mr. J. J. Elliott, Mr. J. Hubert, Mr. H. N. King, and Mr. S. H. Fry. Mr. Frank Bishop and Mr. Howell, Chairman and Solicitor of the Copyright Union, were also present, and the attendance included many other gentlemen directly or indirectly interested in copyright.

LORD CRAWFORD expressed great pleasure at the fact that the first meeting in the new home of the Royal Photographic Society should be called for the purpose of defending photographic copyright. In the course of a few introductory observations the President said he could see no reason why the copyright protection photographers had enjoyed for thirty-seven years should now be taken away from them. His Lordship was followed by Mr. Howell, the Solicitor of the Union, who after pointing out that on the whole the present law of photographic copyright was satisfactory, gave the meeting a lucid statement of the points of principle attacked by the new Bill. These have already been dealt with in our pages. Mr. Howell also repeated the substance of his evidence as given before the Select Committee of the House of Lords now sitting on the Bill; this, too, we summarised last week. But Mr. Howell made one or two very interesting observations upon some other aspects of the Bill which merit notice.

\* \* \*

THE proposed Copyright Bill, which seeks to rob photographers of the rights they have enjoyed, is, it appears, the work of an artistic "cave" which met recently in St. John's Wood. It is composed of Academicians; and, seeking to de-grade photography below the level of photo-mechanical work the promoters of the Bill are said to be animated by jealousy of photography. Lord Herschell's Bill, which was introduced and dropped last session, practically left photographic copyright undisturbed. Besides the attempt of the new Bill to separate photography from the fine arts, Mr. Howell was emphatic in his objections to compulsory registration, which it seeks to enact. He was hopeful that the evidence which was given, and the protest which he suggested should be passed by vote that night, would have the effect of influencing the Select Committee in favour of photographic copyright.

\* \* \*

FOLLOWING Mr. Howell's statement there was a lengthy discussion on points of detail. Two facts were clear. The meeting was resolutely opposed to the separation of photography from the fine arts, and to compulsory registration. Indeed, the prevailing aspiration was that photographic copyright should be left as it stands. In the end, on the suggestion of Lord Crawford, the following resolution was unanimously agreed to: "That in the opinion of this meeting it would be



an injustice to those practising and utilising photography to interfere with the rights and privileges enjoyed by them under the Fine Art (Copyright) Act, 1862." It was intimated at the close of the meeting that the Bill has not the slightest chance of passing through Parliament this session. The resolution we have quoted is to be brought before the Select Committee at the earliest opportunity.

\* \* \*

THE Select Committee held another sitting on Monday last. Mr. Frank Dicksee, R.A., one of the witnesses, said he represented the Royal Academy. A long discussion then took place on Clause 4 of the Bill, by which it is proposed to confer the copyright of the work on any person who "employs another for valuable consideration to make any photograph, or to make or assist in making from the original design of the employer any work of fine art or cast from nature." A painted portrait, the witness explained, would not be included in this category, but the copyright would belong to the author, and, although the "employer" could do what he liked with the original which he had purchased, he could not have it reproduced without the artist's consent. The principle of the Bill, the witness explained, was to give copyright in every case to the author; Clause 4 also gave certain rights to the employer which were rather exceptional.

\* \* \*

THERE WAS a meeting of the Council of the Photographic Convention of the United Kingdom on Thursday, June 22, at which the final arrangements for the Gloucester meeting were discussed. The civic authorities are preparing to give the members a hearty welcome. Not only will the Mayor and Corporation officially receive the Convention, but, in other respects, civic recognition and hospitality will also be extended to members. Mr. Crooke (the President) will probably have on view a collection of his own portrait work. We understand that a very large and beautiful display of platinotype prints by the Platinotype Company will form a feature of the Trade Exhibition in the Guildhall. A great many of the examples, chiefly reproductions of celebrated pictures, have already been shown to us; they will form quite a pictorial exhibition in themselves.

\* \* \*

THE Council drew up a list of nominations for Council for the ensuing year, and wisely removed the names of a number of gentlemen who have figured on the executive for years, but have not considered it their duty to attend a single meeting of the governing body. One or two frivolous complaints about details of administration also came before the Council Meeting. The Convention has recently been the butt of criticism at the hands of a few gentlemen who do absolutely nothing to promote the success of the institution of which they are members, but who seek to atone for this deficiency by the noisiness of their grumbles. However, this sort of thing is best dismissed with a smile. The trade space in the Guildhall has been fully let. Mr. Child Bayley is taking considerable trouble to ensure the success of the Monday evening colour-photography display by means of the projection lanterns to be worked by the able hands of Mr. R. R. Beard, so that local visitors to the inaugural ceremony will have given them a reliable and accurate demonstration of all that has so far been practically achieved by the recognised processes for photographically reproducing colour. As for the more festive items in the

Convention programme, these are bound to be successful, and only fine weather is needed to impart a world of enjoyment to the excursions. Personally, we are looking forward to shaking the hand of many an old friend of the JOURNAL during Convention week.

\* \* \*

MR. C. T. JAGO, of 182, New Kent-road, S.E., to whose process of colour photography, by means of rubbing pigments into a half-tone block, we referred nearly a year ago, writes us as follows: "In *Ex Cathedra* of your issue dated July 29 of last year you noticed my 'idea in colour photography,' for which I had obtained a patent. I am hoping to make some practical use of the idea for a novelty in coloured miniatures. I have a portrait reproduced with a 200-line Levy screen, and, when coloured, the grain is hardly discernible and the pastels are almost a fixture. I think, with a still finer grain, the colours would be quite fixed. Of course, I shall not want the public to know how the picture is produced, except that it is a portrait enamelled on copper, with the colours inlaid by hand; so I think the dot screen would help to hide the fact of its being a process plate. One advantage I find in this kind of picture is that it is impossible to lose the likeness in colouring, the detail being all on the surface and the colours below."

\* \* \*

IT WILL be seen by our Patent News this week that the abnormal number of seventeen applications for photographic patents was made between the dates of June 12 and June 17. Of these two relate to colour photography, and stand in the name of Dr. Gustave Selle, whose processes have formed the subject of considerable comment and curiosity for some time past. We understood that the Company formed to work his patents and processes was to have been introduced to the public before last Easter. To go back to our subject: It would be interesting to know why the middle of the month of June should witness the outbreak of so much activity amongst photographic patentees. Two of the applications relate to cameras. He is a clever man indeed who, in these times, can really "improve" a photographic camera, perhaps the most patented article, after the cycle, of modern times.

\* \* \*

LAST week we printed a little article by Mr. F. G. Willatt, entitled "Photography in Dots." The author advocates the use of an irregularly grained screen in contact printing, arguing that by such means we obtain a general effect of roughness of texture without actually destroying the sharpness of the picture. Some of the photographs printed through such a screen, which Mr. Willatt showed us, are decidedly interesting and attractive, in virtue of the distribution in the lights and half-tones of this effect of non-mechanically obtained "screeniness." The results produced in this way are most artistic. Mr. Willatt, whose address is 101A, Fulham Palace-road, Hammersmith, W., prepares the irregularly grained screens to which we have referred, and they may be had of him at a few shillings each.

\* \* \* Two short editorial articles this week touch on the subjects of "Ferrous-sulphate Solutions" and "The Permanence of Silver Prints," the latter being a matter of the highest importance to photographers.—Mr. Alfred Watkins contributes a further article on "The Speed-marking of Plates," in the course



of which he makes out a case, and pleads, for uniformity in the speed-marking of plates.—There is a note by Dr. Eder, upholding the subhaloid theory of the latent photographic image.—Amongst other articles are two which pressure on our space has obliged us to hold over for some weeks. One is by a well-known American photographer, Mr. W. H. Rau, who briefly describes how to reproduce and enlarge negatives, using gelatine plates for the purpose.—The "New Metric Weights and Measures," as promulgated by a Governmental Order in Council, are reprinted from the Royal Photographic Society's *Journal*. They should be useful for reference, and be kept permanently at hand on that account.

### THE PERMANENCE OF SILVER PRINTS.

THE extract from the *Photographische Chronik*—which we gave last week—on the comparative permanence of silver prints by different processes must not, we think, be taken as conclusive evidence that emulsion papers, with a baryta coating, yield less stable results than papers without it. One thing noteworthy in connexion with the writer's experiments is that all the prints were fixed, for the same time, in a one in twelve solution of hyposulphite of soda. Now, one in twelve is an exceedingly weak solution. In this country the strength of the fixing solution in general use is just about double that strength, namely, three ounces to the pint. It is quite conceivable that, if the free silver in the emulsion forms a compound with the vehicle that secures the baryta to the paper, the weak solution of hypo does not, in the time given, thoroughly get it into the soluble condition to be removed by the washing waters. In the case of the plain papers, of course the fixing bath, weak as it was, had not the baryta coating, and its vehicle, to deal with, therefore a longer immersion of the baryta papers was necessary to make the tests reliable.

The sulphate of baryta, *per se*, may be considered an inert material; but, as we have said before, the sizing material with which it is mixed may have a deleterious action on the silver image. In the experiments quoted in the *Chronik* collodion-chloride is mentioned as one of the papers that changed quickly. Now, it is an established fact that there are many collodion-chloride prints as good now as when they were first produced, more than thirty years ago, and until recently this process was looked upon as the most permanent of all the silver processes, by reason of the fact that the collodion is an inert material, and does not form a compound with silver as does albumen or gelatine. It must be mentioned, however, that in the early days of this process the emulsion was always applied to plain paper, or rather one coated with arrow-root, and not with a thick baryta coating.

At the present time, unfortunately, the manufacture of photographic papers is practically in the hands of two firms, who have recently combined, and the surfacing of them is also in the hands of three or four concerns, who have also combined, hence the emulsion-paper makers, whether gelatine or collodion, are at their mercy, and must take what they choose to send them, whatever the baryta coating may contain. It may be possible that the most desirable vehicle for the baryta, so far as photography is concerned, is not the best for securing an even coating, and therefore is not employed, and so much the worse for emulsion processes.

It is to be regretted, as we have said on previous occasions, that English paper-enamellers have not taken up the surfacing

of paper for photographic purposes, for at the present time this seems to be a monopoly in the hands of two or three. German firms, who have now formed "a ring," thus avoiding competition amongst themselves.

### FERROUS SULPHATE.

In last week's *Chemical News* will be found an extract from a paper by Mr. W. S. Meyer in the *Journal of the American Chemical Society*, entitled "A Convenient Method of Maintaining Reduction of Ferrous Solutions," the writer stating he calls attention to it from its being "economical, convenient, and effective, and (so far as I have been able to ascertain) new in this particular application." From the point of view which we always take of the desirability of uniformity in all stock solutions, and, indeed, in all chemicals, it would be a desirable thing to keep solution of ordinary sulphate of iron without its absorbing oxygen, and so losing its uniformity, an absorption being soon shown by the loss of the beautiful apple-green tint of fresh-made solution. The remedy, however, is scarcely a practical one for photographic purposes, for it consists in strongly acidifying the solution, to the extent, indeed, of adding ten per cent. of strong sulphuric acid to a ten per cent. solution of the sulphate of iron, and also the addition of free iron in the shape of small tacks; in other words, as much sulphuric acid as sulphate of iron with a packet of tacks thrown in. Photographers using the old iron developer are accustomed to add an acid, but they, as a rule, prefer acetic acid, and they further consider that the absorption of oxygen to the extent of making the solution almost red is a distinct advantage. In the strict sense of Mr. Meyer's process, it is not new. Many years ago, when gelatino-bromide plates were unthought of, the pure sulphate of iron usually obtainable quickly used to lose its beautiful green colour, and become oxidised to the rusty stage; but there was also on the market—not commonly sold, it is true—a form of sulphate known as "permanent," small, prettily shaped crystals, of a yellower green than usual, that never changed colour. It was generally understood by experts in chemical manufacture that these crystals were formed in an extremely acid solution of the salt, enough acid being present in the mother liquor to keep the crystals pure for an indefinite time, Mr. Meyer's process being thus rather belated.

**The Metric System.**—Sooner or later, there is little doubt, the metric system of weights and measures will be universally adopted here. Last week, in the House of Commons, in reply to a question as to whether our trade with South America is not suffering materially because the metric system is not compulsorily adopted, Mr. Ritchie replied that there is no reason why any trader or manufacturer in this country may not carry on his foreign trade by metrical weights and measures. In reply to another part of the query as to whether he would facilitate the adoption of the metric system in this country by using metrical weights and measures in the Government departments, the President of the Board of Trade said he was in communication with some of the Government departments on the subject. We are pleased to see that the adoption of this system is increasing amongst photographers by reason of plate-makers and others quoting their formulæ under both the metric and the ordinary systems. It would be still more facilitated, as we have said on more than one previous occasion, if dealers would put upon the market measures graduated on both systems—metric on the one side, and the English on the other—so that they would serve equally



as well for the one as for the other. The same with the weights. If the gramme weights were stamped also with the equivalents in English grains, they would then serve the dual purpose like the measures. That would greatly facilitate the general adoption of the metric system amongst photographers, particularly as most of the formulæ we get from abroad are given according to that system.

**The Turner Exhibition at the Guildhall.**—A few weeks back we advised photographers not to miss the opportunity of visiting the exhibition of some of Turner's finest works—paintings, drawings, and etchings—now open at the Guildhall, as the opportunity may never occur again of seeing such a collection, drawn from so many private collections. On a second visit, paid last week, we learn that, during the short time the Exhibition has been open, it has been visited by close upon 200,000 persons. The Exhibition is open daily, and on Sunday afternoons, and the admission is free. A very explanatory catalogue of the pictures is sold at the doors for 6d. In addition to Turner's work, there are some fine pictures by contemporary artists—Gainsborough, Eddy, and others.

**Hampton Court Pictures.**—Kingston-on-Thames does not like the idea of a number of the pictures in Hampton Court Palace, including several of Raphael's cartoons, being removed from there to Kensington Palace, and the Town Clerk has written to Her Majesty's Office of Works on the subject. The reply received was to the effect that the Corporation of Kingston are apparently not aware that the pictures at Hampton Court Palace are the property of the Sovereign, and are exhibited to the public at the pleasure of Her Majesty, who has exercised her right to add to or withdraw from the collection from time to time, and no question ever had been, or ever could be, raised as to the free exercise of this right. Of course the removal of the works is a loss to Hampton Court Palace, but a gain to Kensington Palace and London people, as the latter Palace is now to be open to the public, and those wishing to see the pictures will not have to make a journey to Hampton to do so. Raphael's cartoons have not been much photographed; but some years ago—thirty or more—they were admirably reproduced on a large size—24×18, if we remember rightly—by Mr. Thurston Thompson.

**An International Beauty Contest.**—There has been an International Beauty Contest in Paris, and the principal prize has gone to a theatrical lady, and her photograph has, no doubt, been in large demand since the award. We are told by the Central News that some American society women were in the competition; also a few Italian, Spanish, and Belgian women. It would seem that no English competed, and one cannot be sorry for it, for it would be degrading. There was once a beauty show in this country, but then it was confined entirely to barmaids, and we are pleased to say the show was but a limited one, and that it was not repeated. So far as we are concerned, we should like female beauty shows to be confined to the other side of the Channel, whether they be international or otherwise. In all exhibitions and shows at which prizes are given they do not always give universal satisfaction; we know that from photographic as well as other exhibitions. It would be exceedingly interesting to know if the Judges' awards at the Paris contest gave universal satisfaction to all the fair competitors. If they *did*, it makes good an old adage, "They manage things better in France."

#### SPEED-MARKING OF PLATES.

At the very mention of the word "speed" the controversialist pricks up his ears in anticipation of the fray, the plate-maker—most placid of good fellows at ordinary times—changes his visage and puts on his invisible armour, and the average reader turns over to the next page with an impatient shrug. Let me therefore hasten to explain that I am not about to enter into the vexed question of the definition of speed, or the means by which it may most accurately be expressed. The time for this is not yet ripe, although we may be a little advanced beyond the knowledge of

1894, when the Plate Speed Committee, appointed by the Royal Photographic Society to investigate and report on the matter, were obliged to separate without definite conclusion, because no two members were agreed in their ideas of the primary definition of speed.

It is rather of the commercial difficulties of speed-marking that I wish to speak, and of the impediments in the way of plate-users getting uniform and reliable information on the point when they buy a box of plates. Who can say that the discussion of these difficulties may not tend towards their ultimate removal?

What the average photographer understands as speed is the outcome of his experience and wants. He is probably using a certain plate, and has a pretty good idea of the exposure necessary to get the results he requires. He wishes to buy another batch of the same brand of plate, and wants to know definitely whether he will have to reduce or increase his exposures, knowing by sad experience that the advertising announcement of "always uniform" is a weak crutch to lean upon. For these reasons it is of the greatest value to have marked on the box a speed number which he knows is the result of an actual test of that batch of emulsion. Or the want is still more urgent if he wishes to try a new brand of plates, and does not feel inclined to spend time and plates in finding the speed by "trial and error." In this latter case it is of the greatest importance that the speed number should not only be the result of an actual test of that batch, but that it should be comparable with the speed numbers of other makers. If both these conditions are not met, speed numbers become a trap to create error, instead of a means of preventing them.

The need for definite speed numbers is more strongly felt as photography tends to become an exact science. Time was when all were content with vague standards of value, such as a "medium-size stop" or a "fair light;" but now, with the increasing use of definite methods of calculating exposures and the adoption of the actinometer as an every-day instrument, it becomes important to apportion an exact value to all the factors which influence an exposure.

It is greatly to the credit of those clever pioneers, Messrs. Hurter & Driffield, that from the first they have done their best to keep speed numbers uniform, and have also tried to prevent their being used as a trade designation of the approximate speed of a maker's brand, instead of an expression of an actual test of that particular batch.

I have purchased two boxes of the same brand of plates from different sources about the same time. Both boxes bore the same H. & D. speed number, printed on the label in such a way as to suggest that it was a stock label, which always bore that speed number for that brand; and, when I tested these two boxes side by side with the Hurter & Driffield method, one was much higher in speed than the other. It is this kind of procedure which brings discredit on speed numbers.

It was the same kind of procedure which brought discredit on the Warnerke speed numbers. Makers printed on their lists and on their labels the statement that their plates were, say, 25 Warnerke, and users found that, although different batches of the same plate varied (as, in the ordinary course of things, they would) in speed, the same numbers continued on the boxes. The Warnerke plan, as most readers will know, is based on ascertaining the smallest light impression which will give a developable image. I am inclined to think that it has been condemned by some on insufficient evidence. It was found that different numbers could be read from the same plate by variations in development; but we now know that the same fact applies to any plan of speed-testing, and there is room for further trial of the plan, not of necessity with the same apparatus, in the light of recent knowledge of the effect of development of speed and of the relation between the time of appearance of image and completion of development.

There are two great obstacles in the way of reform in speed-marking. The first is the insane demand by the public for the highest speed, and the absurd idea that of two plates the highest speed is the best. All practical men know that too often the increase of speed is at the expense of quality in the plate, and that in nine cases out of ten the subject does not demand an extremely rapid plate. But the result has been that makers have all thought it necessary to advertise "the fastest plate made," and the adoption of an accurate and uniform speed system would somewhat clash with this.

The other obstacle is the fiction that a certain brand of plate is always the same speed. When a maker has adopted this fiction in his advertisements, it is a little difficult for him to adopt an accurate system of speed-testing and show the public that his plates do vary in speed.

But those who have had the courage to mark each batch with the speed given by actual test save themselves ultimately from very serious difficulties. For instance, a firm has announced its different brands to



be relative speeds of, say, 1, 2, and 4, and after the manner of the craft intimate that those who say otherwise are beneath contempt. But in the course of time it is desirable to improve one of these brands, or the head plate-maker goes to another place or in some other way a change comes about. What are the poor people to do with all their circulars tying them down to this ratio, and their exposure tables and slide-calculators (called meters by a strange stretch of fancy), all based on the 1, 2, and 4 ratio? They dare not announce a change, or they would bring on their devoted heads shoals of letters of the "how is this" type. How they wish they had earlier adopted the more satisfactory course of acknowledging that, in the natural course of plate-making, speeds will vary, and, if the user is only posted up by the speed number on the box, the variation will be no inconvenience to him.

A third difficulty lies in the fact that what the practical man knows as speed is not a simple but a compound value, built up of at least two qualities, the detail giving quality and the density giving quality. Let me illustrate this by supposing that two photographers are given two brands of plates of different character to test. The one man, who judges only by the detail-giving quality, pronounces A to be a much faster plate than B; the other man, finding that with equal exposures B develops into a vigorous printing negative with much greater facility than A, pronounces B to be the most rapid. Both men are right according to their own standpoint.

It should never be forgotten that the Hurter & Driffield speed numbers relate solely to the detail-giving quality. Two different makes of plates may show the same speed number, and with equal exposures one may develop with ease to printing density and gradation, while the other seems scarcely capable of doing so. The system is quite capable of expressing the density-giving quality as a separate value, but the information is seldom given.

These two investigators (whose names, like King Charles's head in Mr. Dick's memorial, continually crop up in all that is written on this subject) have rendered a great service, by showing clearly that the two qualities I have mentioned must be treated as distinct matters in accurate speed-testing.

I am aware that, in advocating the speed-marking of each batch of plates, I am somewhat open to a charge of inconsistency. "Since 1890," I can hear a critic say, "you have been issuing a speed list of plates, in which you claim to give the relative speed of all plates sold; how can this be accurate if plates vary from time to time?"

My answer is that, although such a list must of necessity be imperfect, it is a need arising out of still more imperfect circumstances. When I introduced an exact plan for calculating exposures, there was no available means of comparing the speeds of different plates sold. A speed list was a necessity for my method, and the only way for me to get the information was to actually test all the plates. I soon found that makers had an inconvenient way of altering their speeds, and to cope with this the list has for some years been kept always in type, and corrections in speed made as soon as they are discovered. Had I been aware of the infinite labour involved in this work, I doubt if anything could have induced me to put my hand to the plough. The worst of it is that, when the result of a test makes it necessary to change the number put opposite a plate, I am sure to get a letter within a few days, asking how it is that I put Messrs. Mède & Persian's "Thunderbolt" at 100, whereas they used to be put at 120. Frankly, I can only regard such a list as a makeshift, to be superseded in time by a uniform plan of speed-marking each box. One rule I have always made, I have never yet quoted a speed number to a plate which was not the result of an actual test by myself; and, as fast as the makers adopt the H & D. plan of speed-marking each box, I am only too glad to cease quoting approximate values to their plates, and to give instead the ratio which their numbers bear to the numbers used in my exposure meter.

I am often asked the question, "What relation do the Warnerke numbers bear to the speed numbers for your meter?" I am obliged to refuse to quote any ratio, because these numbers do not appear to be the result of a test of each batch of plates but mere trade designations printed year after year in the circulars and on the boxes.

Practically the Hurter & Driffield system of speed-marking is the only one in the field at the present time in England. One firm, Messrs. Marion, commenced its use about 1890. Others have followed, at first cautiously and partially, but not one who has commenced to speed-mark each box has, so far, turned back.

Unfortunately it is necessary to point out that different makers' H. & D. numbers have not all the same value. If all used the same standard light, the same developer, at the same temperature, the expression H. & D. 100 would be an absolute one. But under present circumstances it

varies with different makers. There are four makers who speed-mark each box with H. & D. numbers; my own trials (testing altogether by the same method) show that to bring all to a uniform value one has to be multiplied by 2½, one by 1, and two by 1½. The term "H. & D. 100," printed in a circular or on the label of a box in such a way as to indicate that it is a stock number always on that box, is of no more definite value than the term "extra rapid."

It is of the greatest importance that the values indicated by speed numbers should bear the simple ratio indicated by the figures, so that a plate marked 100 will require half the exposure of one marked 50. In the Warnerke numbers each one is supposed to indicate a plate one-third more rapid than the number below, and it is always a puzzle to find out what relation Warnerke 25 bears to Warnerke 30. A still more perplexing plan is to designate the speed of plate by the ratio of diaphragm which will give a standard exposure with it, *f*-45, for instance, being double the speed of *f*-32. It is not difficult to recognise these ratios when the stops are familiar ones, but, when less-known ones, such as *f*-90 and *f*-110, are quoted, and, worse still, when these numbers are printed on a box with the *f* omitted, it would be difficult to add to the muddle.

An ideal plan of uniform speed-testing, but one, I am afraid, not likely to be adopted under present circumstances, would be for some authority, such as the Royal Photographic Society, to establish a central bureau for speed-testing. Makers joining would send samples of each batch made, and the bureau would issue labels bearing the speed, length of gradation, and density-giving value of the plate.

I cannot help wondering whether, when uniform speed numbers come into use, the speed anomalies which are now occasionally met with will cease. For instance, a firm (not an English one) issues three or four brands supposed to be from slow to extra rapid, and, on trial, the supposed highest speed was found to be identical with the lowest. It is more frequent than might be supposed for a maker's top brand to prove on testing to be practically the same as the next on the list, with perhaps a little fog thrown in for the extra price; and on two occasions, in testing the slow and rapid bromide papers of well-known makers, I have found them to be identical. It might be a mistake in packing, but the result to the user remains the same. These are exceptional cases, and, although the approximate ratio of speed given by makers to their different brands is seldom to be depended on, the order of speed is, as a rule, correct.

ALFRED WATKINS.

#### BLACKLEAD PENCILS.

A VERY interesting article appears in the *Chemical News* from the advance sheets of the *Journal of the Franklin Society*, treating upon the origin and manufacture of plumbago—blacklead. Without the so-called blacklead the business of a great many skilled workers would, for a while, be at a standstill, though it should be remembered that the earliest retouchers in this country did not make use of this material upon their negatives. Mr. Edge of Llandudno, of Preston also, in those days, we believe, depended entirely upon Indian ink blacklead pencils, not having any place in his *atelier*, and his work was of the smallest and most delicate. We are sorry to find that up to the present time "blackleads" "made in Germany" have had the preference in this country almost to the exclusion of home-made, though we believe that there are English-made pencils now on the market equal to any foreign. Time was when the market depended for its highest quality of leads entirely upon the output of the mines in Borrowdale, in Cumberland, their product being a beautifully even "lead" entirely free from grit. The pieces of blacklead were simply sawn up and placed in cedar. Nowadays the quarries are exhausted of all large pieces, and we do not believe it is possible to obtain a pure Cumberland lead pencil, whose length of lead is not made up of a number of pieces with a maximum length of an inch or an inch and a half. Some idea of the beautiful character of this material may be formed when we say that we have seen the retouching of a face done direct on to the collodion film without varnish or protection of any kind. At the present time the raw material is made into a fine powder to remove grit, and, with other ingredients added to it, formed into a compact mass by the application of great pressure.

In the article we refer to the writer describes a new process for actually making this graphite by electrical means, and, so far assured of success is the process, that a number of capitalists have combined to erect work: the Niagara Falls' Power Company's Land. The basis of the process is the breaking up of a carbide by the aid of electricity, and already there has been a large output of graphite articles, though of almost non-photographic interest; 200,000 carbon electrodes fifteen inches long and one inch cross section, for example, have already been made.



## SILVER SUB-BROMIDE, THE LATENT IMAGE, AND NASCENT SILVER.

(Translated from the *Photographische Correspondenz*.)

In the last number of the *Photographische Correspondenz* (1899, p. 276) \* I refuted the opinion that nitric acid had the power to destroy the latent image formed by the action of light, and I showed that the principal support of the nascent silver theory (*Silberkeimtheorie*) was thus removed. It is impossible that metallic silver can be formed primarily in the latent image as required by the nascent silver theory, which in my opinion is an erroneous one. It yet remains to be considered to what extent the immediate contact of silver bromide with metallic silver, formed by reduction in the process of development, assists as a concomitant, secondary process in strengthening the image during prolonged development. I referred to this in my last article.

I have made fresh experiments in order to ascertain the behaviour of unexposed silver bromide in contact with silver wire in presence of an oxalate of iron developer. In the series of experiments, which I made many years ago, I observed that reduction by contact took place at those points where contact existed, but a recent repetition of this experiment gave negative results, that is to say, no reduction took place when strong mechanical pressure was avoided. As I have repeated this fresh series of experiments without distinctly being able to detect any reduction of silver set up by the silver wire during the action of the developer upon unexposed silver bromide, I find the opinion, which I recently expressed, considerably strengthened, that the primary image impressed by light is attributable to the formation of sub-bromide by separation of bromine from the exposed silver bromide. The contact of metallic silver with silver bromide merely brings about a subsidiary, secondary effect which is often imperceptible. I attached undue importance to this in the past, but the adherents of the nascent silver theory have over-estimated it in much greater degree.

In accordance with the fundamental facts shown by these experiments, I maintain that the nascent silver theory is inadequate and inapplicable. The opinion that the latent photographic image is due to a change in molecular structure of the silver bromide has more in its favour. This, for instance, is held by Hurter & Driffeld, who try to prove that a complex molecule of silver bromide ( $\text{Ag}_m\text{Br}_n$ ) is changed by the action of light to a simple molecule.

According to the sub-haloid theory it is assumed that  $\text{Ag}_m\text{Br}_n$  is changed to  $\text{Ag}_m\text{Br}_2$  by loss of bromine,  $m$  being greater than  $n$ . By the latter theory the addition of bromine in the elementary state should destroy the latent photographic image and convert it to normal silver bromide, the bromine which was lost being restored to the molecule and forming silver bromide as it existed prior to exposure. I repeated the experiment, which has frequently been described, in the following manner: A collodio-bromide wet plate was prepared (see *Photographische Correspondenz*, 1899, p. 277)† and exposed in the camera. The silver nitrate was removed by washing, the plate then immersed for seven minutes in a one per cent. solution of potassium bromide and afterwards developed with an alkaline glycin developer. A plucky negative was obtained, as the alkaline bromides do not destroy the latent photographic image. In the next experiment bromine water was added to the solution of potassium bromide until it assumed a pronounced yellow colour. After bathing an exposed plate in this solution the developer did not produce any trace of a photographic image.

It is easy to show that this experiment harmonises with the silver sub-bromide theory, but it is difficult to make it agree with the opinion that the molecular structure of the latent image is changed.

It seems to me, for these reasons, that the sub-haloid theory of the latent photographic image agrees most readily with the facts ascertained by experiment, and at the same time it suffices to explain the photographic phenomena in an adequate and unstrained manner.

DR. J. M. EDER.

## FOREIGN NEWS AND NOTES.

**Cyanotype.**—Gustav Griot informs the editor of the *Photographische Correspondenz* that he has found a noticeable difference in the character and sensitiveness of cyanotype paper according to the length of time the sensitising solutions have been kept. The formula used was taken from Dr. Eder's *Ausführliches Handbuch* (second edition, 1899, vol. xiii.). Freshly prepared solutions of ammonium ferric citrate and ferricyanide of potassium, used half an hour after preparation, gave a paper showing perceptible grain and a tinge of

\* THE BRITISH JOURNAL OF PHOTOGRAPHY, 1899, p. 307.  
† Ibid, p. 308.

grey. The prints were hard and not suitable for half-tone subjects. After keeping the separate solutions for a day, the paper showed no grain and was of a pure yellow colour. This was also the case even when the solutions had been kept for weeks. The paper was likewise three times more sensitive and gave pure whites and good half-tones. The appearance of the prints made with solutions which had been kept was far superior and more delicate than of those made with fresh solutions. The same salts and paper were used in each case, and the prints were made immediately the paper was dry.

**A New Fixing Agent.**—In the current number of the *Bulletin de la Société Française*, Messrs. Lumière give particulars of a new fixing salt (acid anhydrous hyposulphite of soda), which they recommend. It dissolves immediately. Taken weight for weight, it does twice the work. Being acid, it does not become discoloured rapidly, even if the plates have been insufficiently washed before fixing. It also tends to harden the film of a gelatine negative. The salt should be used in an eight per cent. solution.

**Pope Leo XIII. and Photography.**—We read in *Ombres et Lumières* that the following Latin verse is from the pen of the venerable head of the Roman Catholic Church:—

"Ars photographica,  
Expressa Solis spiculis  
Nitens imago, quam bene  
Frontis decus, vim luminum  
Refers, et ovis gratiam!  
O mira virtus ingeni!  
Novumque monstrum! Imaginem  
Natura Apelles amulus  
Non pulchriorem pingeret."

**Copper versus Zinc for Process Work.**—The French paper, *Typo-Litho*, draws attention to the superiority of American process work, and points to the use of copper instead of zinc plates as the cause. One of the difficulties experienced in process work is that, after a number of impressions have been taken from a zinc plate, it blocks up. This was the difficulty experienced in America until the enamel process upon copper was used. If we examine with a strong magnifying glass the ground of a zinc plate etched with nitric acid, and compare it with that of a copper plate etched with perchloride of iron, the former will have a rough appearance, resembling a file, whilst the latter is clean and the points stand out from it in good relief. The condition of the zinc is such that the roller gradually fills up the interstices. Two hundred and fifty thousand impressions can be taken from a copper plate etched with perchloride of iron.

**Printing Unfixed Negatives.**—M. Ch. Gravier obtains a quick proof by washing the negative for a short time after development, pressing upon it a piece of bromide paper previously soaked in water and exposing it to a lamp for a few seconds. The exposure is, of course, much longer than would be required for a fixed negative, but the print is scarcely distinguishable from one obtained in the ordinary. The negative may afterwards be fixed in the usual manner. M. Gravier obtained a print in this way about two minutes after exposure, under specially arranged conditions. The following is the record of the operations: Development of the negative, 30 seconds; washing, 5 seconds; pressing on the soaked bromide paper and drying the back of the negative, 6 seconds; exposure of the print to gas, 5 seconds; development of the print, 30 seconds; fixing the print in a twenty-five per cent. acid fixing bath, 30 seconds; washing, 5 seconds.

## REPRODUCING AND ENLARGING NEGATIVES.

[Paper read before the Photographic Society of Philadelphia and reprinted from its *Journal*.]

THE process of reproducing negatives is one whose value has been underestimated or the difficulties exaggerated. It is needless to enumerate the various instances when it becomes desirable for the photographer, be he amateur or professional, to duplicate a negative. There are many of the former class who do not care to be encumbered with a large camera, but who, in the course of their travels, succeed in obtaining many artistic pictures, which, but for their size, would be well worthy of framing. It is always a satisfaction to the amateur photographer to point to sundry pictures adorning his wall, and exclaim with pardonable pride, "I made those!" By the process of reproduction it becomes possible for him to



obtain an enlarged copy of his original negative, from which most satisfactory contact prints may be made.

It frequently, too, happens that a photograph is made with a small camera, not from choice, but from necessity, as, for example, in photographing from a boat in motion. The negative thus made can be enlarged to the required size, with precisely the same result as if a larger camera had been used in the first place.

Sometimes a rare or valuable negative is made upon thin glass, and, although it is necessary to make a number of prints from it, the owner does not care to risk its possible injury. A duplicate of the original easily solves the difficulty.

Again, an order comes in for a great number of prints, and it is found impossible to make them in the allotted time from one negative, but by reproducing this negative the work is accomplished with facility.

A broken negative which cannot readily be replaced may be successfully reproduced.

I have, in fact, been called upon frequently to enlarge negatives where it was impossible or too expensive to make them over direct. A reversed negative is sometimes wanted of a choice subject for a photo-mechanical process.

Appreciating the value of the process, the first step is the making of the positive. No doubt, carbon is the most satisfactory, as there is no grain or deposit, but few can handle the process, and it is seldom used, excepting by some of the large firms, who have every facility at hand. Albumen is also most satisfactory, but the formula is complicated and tedious, and the once well-known "Edwards process" is now obsolete, or seldom used. Thoroughly satisfactory results can be obtained with commercial gelatine dry plates. Various writers have contended either for contact or enlarged positives. My experience has been in favour of a contact positive, unless the resulting negative was to be greatly enlarged and the positive needed considerable spotting or artistic hand work.

Having carefully studied the character of the negative—its unevenness, its colour—carefully clean the back, and place in a deep printing frame a size larger than the negative, having in it a thin plate glass free from bubbles and scratches. Arrange the negative in the centre, brushing away all grit or dust with a soft blender, and place the plate face down in contact with the negative, using a dark, soft pad between it and the back, which must be gently pressed into position.

A light of standard intensity should be adopted in order to ensure success in exposing, and it should be enclosed in a lantern with an exposing door.

A Welsbach jet is uncertain unless the mantles are frequently renewed. An ordinary gas jet or incandescent lamp of either sixteen or thirty-two candle power will answer, although a good oil lamp is probably as sure as any other light, and quite satisfactory.

The length of exposure will depend on the speed of the plate, the distance from the light, and the density of the negative. A negative of average density, with a rapid plate, requires from three to six seconds, when the exposure is made within eighteen inches from the light, and increases with the distance. During the exposure, dodging may be resorted to—such as shading thin places or prolonging the exposure in dense portions by moving in front of the subject a card with a hole, moving this so that no sharp outline may result.

I prefer using a plate a size larger than the negative in order to get a more even positive. Having properly exposed the plate, development is next in order. Any good developer will do, but I prefer one giving a grey image, similar to wet collodion. I have used, for several years, a formula worked out by Mr. William Bell, which is most satisfactory, and is as follows:—

## No. 1.

Water ..... 64 ounces.  
Sulphite of soda crystals ..... 4 "

Dissolve, and make slightly acid with sulphuric C.P., then add—

Eikonogen ..... 320 grains.  
Hydroquinone ..... 320 "

## No. 2.

Water ..... 64 ounces.  
Sulphite of soda crystals ..... 2 "  
Carbonate of potash ..... 8 "

To dissolve the sulphite of soda crystals in No. 1 solution, heat about one-third of the water, and the soda will dissolve more readily. To develop, use equal parts of No. 1 and No. 2.

In warm weather, reduce with one-third water. Bromide is a very active restrainer, and should be used cautiously. Should a positive be desired requiring brilliancy, use less of No. 2 and more of No. 1, and *vice versa*.

Develop slowly and carefully, and try for a positive that will have the highest lights fully covered, and the shadows soft and full of detail. Should it be the intention to enlarge the negative, then make the positive somewhat weaker than for contact. I believe most failures are due to poor positives, and I will show two that I used to enlarge from that are just right. A positive cannot safely be judged by artificial light, as colour will show only in daylight.

Should the negative to be reproduced be broken, carefully lay the

pieces together, bringing them in close contact, and, if possible, hold the printing frame during exposure in such position that the cracks will cast no shadow; if this is not possible, move the frame slowly during exposure, to lessen the shadow of the break. The positive should then be placed in the hands of a skilled etcher and retoucher, who can scrape away and fill in with ink, until the mark is lost. In fact, a great amount of careful retouching can often be done on the positive.

The making of the negative is done in precisely the same manner as making the positive, when a negative of the same size is desired.

Should the reproduction be wanted for phototyping or any process requiring a reversed negative, the negative must be made in the camera, placing the positive in position with the film turned away from the lens. In enlarging negatives, either a lens of short focus or a camera having a long bellows should be used. Any good lens will do, although I prefer one that is rapid and rectilinear. The time of exposure depends on conditions of light, colour of the positive, and speed of the plate used. In this part of the process I generally use rapid plates, and develop precisely as though the exposure was a portrait or landscape, watching for the same effect, and in every way judging the result of the same.

Cleanliness, good judgment and care, with skill in development, are necessary to obtain the best results.

W. H. RAU.

## NEW METRIC WEIGHTS AND MEASURES.

(From the *Journal* of the Royal Photographic Society.)

In accordance with a resolution passed by the Council of this Society, directing the publication, in the *Journal*, of the Order in Council dated May 19, 1898, substituting a new table of imperial and metric equivalents for that set forth in Part I of the Third Schedule of the Weights and Measures Act, 1878, we give below an abstract from the new Schedule of such measures of weight, length, capacity, &c., which are in common use amongst photographers in this country:—

## Equivalents of Metric Weights and Measures in Terms of Imperial Weights and Measures.

## LINEAR MEASURE.

1 millimetre (mm.) ( $\frac{1}{1000}$ m.)	...	=	0.03937 inch.
1 centimetre ( $\frac{1}{100}$ m.)	...	=	0.3937 "
1 decimetre ( $\frac{1}{10}$ m.)	...	=	3.937 inches.
1 metre (m.)	...	=	39.370113 inches.
			3.280843 feet.
			1.0936143 yard.
1 decametre (10 m.)	...	=	10.936 yards.
1 hectometre (100 m.)	...	=	109.36 "
1 kilometre (1000 m.)	...	=	0.62137 mile.

## SQUARE MEASURE.

1 square centimetre	...	=	0.15500 sq. inch
1 square decimetre (100 square centimetres)	...	=	15.500 inches
1 square metre (100 square decimetres)	...	=	10.7639 square feet.
		=	1.1960 " yard.

## CUBIC MEASURE.

1 cubic centimetre	...	=	0.0610 cubic inches.
1 cubic decimetre (c. d.) (1000 cubic centimetres)	...	=	61.024 "
1 cubic metre (1000 cubic decimetres)	...	=	35.3148 cubic feet.
		=	1.307954 " yard.

## MEASURE OF CAPACITY.

1 centilitre ( $\frac{1}{100}$ litre)	...	=	0.070 gill.
1 decilitre ( $\frac{1}{10}$ litre)	...	=	0.176 pint.
1 litre	...	=	1.75980 pint.
1 dekalitre (10 litres)	...	=	2.200 gallons.

## WEIGHT.

			<i>Avoirdupois.</i>
1 milligramme ( $\frac{1}{1000}$ gm.)	...	=	0.015 grain.
1 centigramme ( $\frac{1}{100}$ gm.)	...	=	0.154 "
1 decigramme ( $\frac{1}{10}$ gm.)	...	=	1.543 "
1 gramme (1 gm.)	...	=	15.432 grains.
1 dekagramme (10 gm.)	...	=	5.644 drachms.
1 hectogramme (100 gm.)	...	=	3.527 ounces.
1 kilogramme (1000 gm.)	...	=	2.2046223 lbs. or 15432.3564 grains.
1 quintal (100 kilog.)	...	=	1.968 cwt.

*Apothecaries'.*

1 gramme (1 gm.)	...	=	0.2572 drachm.
		=	0.7716 scruple.
		=	15.432 grains.

*Troy.*

1 gramme (1 gm.)	...	=	0.03215 ounce.
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*Equivalents of Imperial Weights and Measures in Terms of Metric Weights and Measures.*

LINEAR MEASURE.

1 inch	...	...	=	25.400 millimetres.
1 foot	...	...	=	0.30480 metre.
1 yard	...	...	=	0.914399 "
1 mile	...	...	=	1.6093 kilometre.

SQUARE MEASURE.

1 square inch	...	...	=	6.4516 square centimetres.
1 " foot	...	...	=	9.2903 " decimetres.
1 " yard	...	...	=	0.836126 " metre.
1 " mile	...	...	=	259.00 hectares.

CUBIC MEASURE.

1 cubic inch	...	...	=	16.387 cubic centimetres.
1 " foot	...	...	=	0.28317 cubic metre.
1 " yard	...	...	=	0.764553 "

MEASURES OF CAPACITY.

1 pint	...	...	=	0.568 litre.
1 quart	...	...	=	1.136 "
1 gallon	...	...	=	4.5459681 litres.

APOTHECARIES' MEASURE.

1 minim	...	...	=	0.059 millilitre.
1 fluid scruple	...	...	=	1.184 "
1 " drachm (60 minims)	...	...	=	3.552 millilitres.
1 " ounce (8 drachms)	...	...	=	2.84128 centilitres.
1 pint	...	...	=	0.568 litre.

AVOIRDUPOIS WEIGHT.

1 grain	...	...	=	0.0648 gramme.
1 ounce	...	...	=	28.350 grammes.
1 pound	...	...	=	0.45359243 kilogramme.
1 hundredweight	...	...	=	50.80 kilogrammes.

APOTHECARIES' WEIGHT.

1 grain	...	...	=	0.0648 gramme.
1 scruple (20 grains)	...	...	=	1.296 "
1 drachm (3 scruples)	...	...	=	3.888 grammes.
1 ounce (8 drachms)	...	...	=	31.1035 "

*Note.*—The metre is represented by the distance marked by two fine lines on the iridio-platinum standard bar numbered 16, when at the temperature of 0° Centigrade. This bar is deposited with the Board of Trade. The metre is the only unit of metric measure of extension from which all other metric measures of extension, whether linear, superficial, or solid, shall be ascertained.

The kilogramme is represented by the cylindrical iridio-platinum standard kilogramme weight numbered 18, which is deposited with the Board of Trade. The kilogramme is the only unit of metric weight from which all other metric weights, and all measures having reference to metric weight, shall be ascertained.

The litre is represented by the capacity at 0° Centigrade of the cylindrical brass measure marked "litre, 1897" (which is deposited with the Board of Trade), and having a diameter equal to one-half its height. This litre at 0° Centigrade when full contains one kilogramme of distilled water at the temperature of 4° centigrade, under an atmospheric pressure equal to that represented by a column of mercury 760 millimetres high at 0° Centigrade at sea level, and at latitude 45°, the weighing being made in air, but reduced by calculation to a vacuum. It is the only unit of metric measure of capacity from which all other metric measures of capacity, as well for liquids as for dry goods, shall be ascertained.

RELIEF PHOTOGRAPHY: NEUHAUS'S PROCESS.

HERE NEUHAUS'S method, as described by himself in his Patent specification, is as follows:—

The photographic print which is desired to be put in relief should be mounted on some sized drawing paper (Dutch hand-made paper is to be preferred) by the aid of some strong glue. When the glue is dry, the outline of the image or parts of the image to be put in relief is traced upon the rear side of the mounted photograph by aid of holding the front side of said photograph towards the light, so as to allow the manipulator to look through the photograph. A retouching desk is the best thing to use for the operation.

The photograph is then damped with water on its front side within and along the outline of the portrait or parts of the portrait to be put in relief.

The photograph is then placed face downwards upon a piece of plastic material, as, for instance, pastaline (a kind of clay used by sculptors for modelling purposes).

The pastaline has first been furnished with a smooth surface of a suitable size by working it with a smooth roller.

In order to protect the photograph from direct contact with the generally somewhat sticky material upon which it is placed, the latter is covered with a piece of strong soft paper, for instance, paper treated with paraffin.

Those parts of the photograph which it is desired should be put in relief are now, from the back, with a suitable tool pressed or moulded downwards into the pastaline to such an extent as the face, figure, and costume to be put in relief may require and in accordance with the artistic taste of the manipulator.

The parts of the photograph once put in relief remain so by reason of the presence of the glue in the sized drawing-paper and between the print and the Dutch paper.

The picture may during the time it is worked be taken up and turned over in order to allow the manipulator to ascertain the effect; but, if further pressing or moulding has to be made, it must be kept constantly moist, as it would otherwise crack.

When the image has been made to stand out in the desired manner, it is dried, and the recesses at the back of it are filled with a little cotton-wool, whereupon it is placed, face upwards, upon a piece of the above-mentioned pastaline, which has been furnished with a smooth surface.

The photograph is then covered with a piece of strong, soft, transparent paper, as, for instance, paper treated with paraffin.

The outline is now pressed or moulded with a suitable tool downwards upon the pastaline in places where parts of the figure to be placed in relief are desired to be brought sharply out, the paraffin paper preventing any damage to the print.

Finally, the photograph is taken into the hand and the finishing moulding of the image is made with a suitable tool direct on the print without use of any paper between the tool and the print, the finger being used for backing support.

The photograph worked out in relief is now mounted on the same sort of sized paper as used for mounting the print.

A piece of said paper of same size as the photograph is covered with a coat of glue, and the photograph, in dry condition, is then placed upon it without filling in of anything between the paper and the recess in the photograph. The photograph is then pressed by the aid of the hand downwards against the paper, but only at those parts of the photograph that have not been brought to stand out in relief.

The object of placing the dry photograph on the paper, that has been made wet by the glue, is to allow the paper to help to keep the relief photograph in the form it has received by the aid of shrinking as it gets dry.

The mounted photograph is now ready for framing.

TRICHROMATIC PHOTOGRAPHY AT THE ROYAL SOCIETY'S SOIREE.

ONE of the most interesting exhibits, from a photographic point of view, at the recent Ladies' Night of the Royal Society was that of Mr. W. Saville-Kent, F.L.S., which included some excellent examples of lantern and stereoscopic slides as natural-colour photographs. These transparencies were reproduced by the Ives system, the negatives being taken through screens of red, green, and blue-violet, and positives produced as three-film or glass transparencies from same, each of which is tinted with the colour complementary to that of its respective negative, and then the three are superimposed in correct register.

The excellence of the later examples produced is such as to justify reference to the subjects themselves, and certainly, for a naturalist or biologist, the system was shown to be of special value, as permanent records of colour are by its means obtained even of marine and other forms of life that have brilliant tints of an evanescent character.

On the table and in a show frame were transparencies of a larger size that were exhibited at the previous (black) *Soirée* of the Royal Society, and one particularly, of half-plate size, gave a faithful representation of the Queensland regent bird and laughing kingfisher. Here the colours were very pure, and among some of them noted were lilac, blue (deep and light), yellow, and brown and grey in the bird's tail. A stuffed specimen of one of the birds represented in the photograph was on the table for comparison, and certainly the purpose was well served, for the transparencies were very like the original. A blue morpho-butterfly was also well reproduced, while Brazilian foliage looked very natural, and pale pink cacti showed most delicate of tints. It is to be hoped that Mr. Saville-Kent will give a demonstration of his method of working, or read a paper shortly on the subject, so that other workers who have time to do so may take up this interesting branch. The results are, no doubt, largely due to manipulative skill and care, for the superposition in the subject we have referred to was excellent, and even stood the test of a critical examination with a magnifier.

It was understood the exposure when making the negatives was about ten minutes altogether, the red requiring five; green, three and a half; and blue, one and a half minutes. Of course, with these long exposures, only still life can be reproduced, but Mr. Saville-Kent is personally so-



impressed with the value of the process that he proposes visiting Australia again, and using this method of obtaining records for the illustrations in his new books on zoological and botanical subjects. Asked as to the cost of production of such transparencies, he said that, from his experience and the time taken by himself, he should say they could, as a commercial matter, be sold as lantern slides at five shillings each, and as half-plate transparencies at one guinea each.

### "COUNTRY LIFE" PHOTOGRAPHIC COMPETITION.

Our contemporary, *Country Life*, is organizing a photographic competition, of which, in its last issue, it gave the following particulars:—

From time to time readers of *Country Life* who are interested in photography send specimens of their work. Many of the photographs they forward are of excellent merit. With a view to their encouragement it has been determined to begin another photographic competition. A first prize of twenty pounds, second prize of ten pounds, and third prize of five pounds will be given for the three best sets of not less than twelve photographs illustrative of country life in any of its phases. The following list will suggest the subjects that will receive favourable consideration:—

Gardens such as those appearing with the articles "Gardens Old and New," cottage gardens, tree and floral studies, moated houses, old wrought-iron gates and other ironwork, picturesque villages and cottages, village industries and life, village halls, agriculture in any of its forms, picturesque farm buildings, leadwork—vases, figures, cisterns, &c., animal or bird life, doves, various outdoor sports, such as fishing, shooting, hawking, yachting, &c.

In addition to the three prizes named, a special one of five pounds will be given for the best set of not less than six photographs illustrating the most artistic effects that can be obtained in gardening.

The photographs should be silver prints—preferably on printing-out paper—not smaller than half-plate size, and should be carefully packed, and addressed to the editor in a parcel bearing the words "Photographic Competition" on the outside. For the purpose of identification each individual photograph must be clearly marked with the name and address of the competitor, but no responsibility for the safe keeping of the competing photographs can be accepted, although every care will be taken to return safely any unsuccessful photographs if stamps for this purpose are enclosed.

It is understood that all reproduction rights of the successful photographs will pass to the proprietors of *Country Life*, and, if required, the negatives of these pictures will be given up to them. The proprietors also reserve to themselves the right to make use of any of the unsuccessful photographs upon payment of from 5s. to 10s. 6d. for each picture published, according to their idea of merit.

The competition will close on October 14, and the decision of the editor, which will be final and without appeal, will be announced as early as possible after this date.

### A NEW PRINTING PROCESS.

It is a somewhat bold statement to make, but it looks, says the *Scotsman*, as if the printing trade were on the eve of a far-reaching change. For some time inventors have been at work trying with but scant success to utilise electricity so as to do away with the necessity of using ink and rollers, and both in America and in France reliance has been placed on the Röntgen rays, a process which, so far as it has gone, would be of little practical value, owing to its cost and the development necessary to give prominence to the text or illustrations fixed on sensitised paper, a process occupying so much time as to render it useless where quick work is essential, as in connexion with the issue of newspapers.

While many inventors have been trying to abolish types, machines, ink, and the printer, Mr. W. Friese-Greene turned his attention in another direction. Without abolishing the use of type he has succeeded, by means of electricity and paper chemically prepared in the course of manufacture, in getting a clear and readable impression in dense black or in any lighter colour through electrical resistance applied to the printing surface, whether type or stereotype, without the use of ink or rollers. Everybody familiar with the printing trade knows what a boon it would be to be able to do away with ink, which is not only a necessary but a costly item in the production of printed work.

It is asserted by those into whose hands Mr. Greene's patent has passed that the chemical process of sensitising the paper at the time of manufacture is so easy and so cheap that it will not make the slightest difference in the selling price of paper. The new chemical will take the place of one now used in paper-manufacture, and licences at a merely nominal charge will be granted to any paper-maker, so that, if the new process of printing becomes common, supplies of paper will be obtained through existing channels.

One exceedingly important feature in the new invention is that there will be no necessity for those already possessed of printing plant to dispense with the old and replace it with new machinery. All that is necessary is to leave off the rollers and discard all the movable parts of the working arrangements that do not interfere with the running of the machine, and to cover the cylinder with a thin sheet of zinc. It is then

ready to be put in circuit with the electric current in the usual way by means of negative and positive wires, which come in contact with every revolution of the cylinder, and produce the printed sheets in the case of fast rotary news machines at a rate that is claimed to be equal to three to two as compared with the speed of existing machines using ink and rollers.

It is claimed for the invention that it will largely reduce the cost of printing, that it is much clearer, and that the impression produced is superior to that obtained by any existing ink process. Practical demonstrations of the work can be seen at the syndicate's headquarters in London on ordinary printing machines, with all the unnecessary portions removed, and arrangements are rapidly being completed to offer the invention to the trade. It may be interesting to mention that the syndicate which has possession of the patent is composed exclusively of Scotsmen, and a good deal of money for experimental purposes has been found in Edinburgh. So far the printing trade has been very sceptical as to the value of the invention.

### TRICOLOUR TRANSPARENCIES FOR PROJECTION AND THE STEREOSCOPE.

I.

The following notes in the current number of the *Photographische Rundschau* on the above subject, by A. Freiherr von Hübl, the well-known writer and author of the book, *Die Dreifarben-Photographie*, may be of interest at the present moment, when so much attention is directed to this subject.

When two or more colours are mixed together, there is formed, besides the new colour, always a certain quantity of black, which gives the compound colour an impure appearance. Precisely the same phenomenon occurs when coloured light is added to coloured light, only in this case the impurity is the admixture of white. For instance, if a yellow and blue pigment be mixed together, the result is not a pure, but only a dirty green, and, if yellow and blue light be mixed together, a greenish white is formed.

The impurity by black or white is the more noticeable the more impure the colours used for making the mixture are, since the intensity of the sensation increases in logarithmic progression with the quantity of the black or white that is present. The quantity of the black or white formed is greater the further the components are separated in the chromatic circle; that is to say, the more different they appear to our eyes. Peacock blue and yellow give a relatively pure green; with Paris blue and chrome yellow there is formed a muddy green; ultramarine and chrome yellow give only a greenish grey; and with suitable colours there disappears, as is well known, any sensation of colour, and only pure grey or black is formed.

These facts are of great importance for the indirect production of colours. If with this process correct and sufficiently bright mixed colours are required, there must be used not only the correct, but, as far as possible, the purest fundamental colours.

For three-colour printing this requirement of the purity of the colours cannot be absolutely fulfilled, and, even if the photographic separation of the colours is perfect, one has always to contend with the degradation of the mixed tones. This is principally the case with the green, which, without retouching the red plate, almost always appears impure, since, for the formation of this compound colour, almost all the printing inks usually chosen are unsuitable. In polychrome projection, and in Joly's line process, yellow, bluish-green, and carmine appear insufficiently saturated and almost white.

These colours behave most favourably in transparent pictures prepared according to the three-colour printing process. The separate monochrome pictures required for this work can be prepared so pure in colour by means of aniline colours that the compound colours formed by superposition show absolute brilliancy. This process gives therefore undoubtedly the most perfect results, and surpasses, as regards the correctness of the colour reproduction, any other method of indirect photochromy. Without any retouching of the negative all colours are obtained, and not one appears to be printed at the cost of another, and therefore this process forms a striking proof for the possibility of three-colour printing, and for the correctness of its theoretical basis.

Such transparent images are especially suitable for projection work, and recently Lumière has placed such stereoscopic pictures on the market under the name of "Photographie des Couleurs." With the latter there is formed, not only the colour brilliancy of the object true to nature and the reproduction of the bloom, but stereoscopic relief, so that an astonishing effect is obtained.

The author has already, in 1897,\* described the method of preparation of such three-colour pictures; but, as since that time improvements have been effected, a connected description of this process is given in the following lines, especially with regard to the preparation of lantern and stereoscopic pictures:—

First of all, the fundamental colours for the monochrome pictures have to be chosen, then the three negatives have to be prepared to correspond to this choice; from these transparent prints in these colours have to be produced, and, finally, these have to be combined, by superposition, to form the finished picture.

\* *Die Dreifarben-Photographie*, 1897



As fundamental colours, crimson, greenish-blue, and yellow are chosen, a colour system the theoretical correctness of which the author has repeatedly proved.

#### I.—THE PHOTOGRAPHIC NEGATIVES.

(a) *On the Colour-sensitive Plates.*—On the ground of reasons to be explained hereafter, the use of the gelatine plates will be found to be the most convenient, and they must be sensitised for the above fundamental colours.

For the negative which is used for the preparation of the yellow print an ordinary plate, without a light filter, may be used. Theoretically, the use of a violet filter is correct, in order to reduce the action of the blue-green rays. Its action is, however, scarcely recognisable, and there in practice this complication may be avoided.

The gelatine plate which must give the negative for the red print must be sensitive to yellow and green. On account of simplicity it is advisable to use a commercial orthochromatic plate, although its band of sensitiveness only incompletely satisfies the theoretical requirements. By means of a tolerably deep green filter, the natural blue sensitiveness of the plate is eliminated, and the sensitive band corrected by displacement towards the blue-green.

The third negative (for the blue print) requires the use of a red and yellow sensitive plate and an orange filter. A Lumière orthochromatic plate, Series B, or a cyanine-bathed plate may be used, for the preparation of the latter has suggested a process which has proved to be excellent. The sensitising bath is composed of—

Dextrine solution (ten per cent. in water) .....	400 parts.
Alcohol .....	150 "
Cold saturated solution of borax .....	20 "
Cyanine solution (1:500) .....	3 "

Ordinary, clear, and vigorous working plates are immersed in this solution for about five minutes and then dried in absolute darkness away from dust. The solution will keep for a long time, but must be filtered each time before use, and enough cyanine added so that it appears a bright blue.

The plates will keep for about eight days. They are extraordinarily red sensitive, and require a shorter exposure than the above-mentioned Lumière plates. On account of this high sensitiveness they must be in all manipulations, especially in developing, most carefully protected from red light.

If to the above sensitiser about 8 parts of a 1:50 solution of acridine be added, and, instead of the ordinary, a commercial orthochromatic plate be bathed, the result will be a plate which may also be used for the red printing. They are then panchromatic, and may be used for all three exposures, and only the filters have to be changed. The difficulty in handling cyanine bath plates makes this recommendation, however, less worthy of recommendation.

(b) *The Colour Filters.*—For the colour filters the best thing to use is thin glass plates of the exact size of the dry plate, coated with coloured gelatine, which should be placed with the coloured film in contact with the film of the plate in the dark slide. If these filter plates are chosen of equal thickness, the sensitive plate will always be at the same distance behind the optical image, and therefore the negative would be out of focus, and consequently it is advisable to focus with the ground glass reversed in the frame or to focus as usual, and then to displace the lens or the dark-slide frame the thickness of the filter plate.

The exposure for the yellow plate is effected, as already mentioned, without a colour filter, and therefore a piece of plain glass should be used instead of this. The placing of the filter in the dark slide is in such small sizes as would be used for lantern and stereoscopic work to be preferred to any other system, for in this way absolute sharpness of the negatives is obtained, and there is no necessity to change the filters, and, if three dark slides are used, the exposures may be made one after the other without loss of time.

The plates for the coloured filters are obtained by bathing a sheet of glass-coated with gelatine in the proper dyes, and the simplest way is to employ unused gelatino-bromide plates, to treat them with hypo, in order to dissolve the silver bromide, and then to thoroughly wash. Plates should be chosen of equal thickness, without flaws in the glass, and of which the silver-bromide film is equally thick, and not damaged, and which show neither streaks nor other coating failures. After washing, the plates, whilst still wet, are placed in a dish and flowed over with the dye solution, and left till the gelatine film appears sufficiently saturated with colour, for which some hours are required. In order to prevent unequal absorption of the dye, the dish should be occasionally shaken. The following is the composition of the dye baths recommended:—

#### For the Orange Screen.

Water .....	100 parts.
Alcohol .....	20 "
Biebrich scarlet (1:200) .....	20 "
Methyl orange (1:200) .....	5 "
Naphthol yellow S.L.* (1:200) .....	5 "
Glacial acetic acid .....	3 "

\* To be obtained from the Aktiengesellschaft für Chemische, Basle.

#### For the Green Screen.

Water .....	100 parts.
Alcohol .....	40 "
Echtgrün blaulich* (1:200) .....	12 "
Naphthol yellow S.L. (1:200) .....	40 "
Glacial acetic acid .....	3 "

When the plates have become a deep colour, they should be washed in distilled water mixed with a little acetic acid, and then deposited in a place free from dust to dry. Whether the intensity of the colour is sufficient can only be determined by experiments with a colour chart, and the author specially recommends that issued with his previously mentioned work.

(c) *The Process of Making the Negatives.*—In three-colour photography, all failures in the three positives will be seen as failures in the reproduction of the colours, and these will be principally seen in the compound colours which are formed by the admixture of the fundamental colours. This applies, in the first place, to grey, for the purity of which our eye is extremely sensitive; then, however, for all broken tones, such as brown, chamois, &c.

The reproduction of objects with vivid colours is, therefore, the easiest, whilst objects poor in colour can only be rendered true to nature by faultless harmony of the three positives.

For these reasons it is easy to make colour pictures of flowers and fruit, whilst landscapes and portraits present considerable difficulties. The neutral shading of silver objects appears with the least error untrue, whilst gold, brass, and copper always reproduce well.

Extensive surfaces of uniform colour lose, by almost invisible faults in the positive, their even colouration, and appear then unequal in colour, which detracts in a high degree from the impression of the whole picture.

These difficulties should be kept in mind when choosing and arranging the objects to be reproduced. A smooth grey or bright brown background, for instance, should always be avoided, a black or white one is always satisfactory; velvet or plush drapery in lively red, blue or green colours, are specially to be recommended for stereoscopic work, as the brilliant gloss and the texture of such materials are readily reproduced. For lantern slides, on the other hand, a coloured cloth or tapestry background is to be preferred.

The camera must be so fixed that any shift of the same when changing the plates is avoided. A very slight shift of the camera during the taking of the three negatives would alter the dimensions of the negative, and would exclude the correct superposition of the separate images. In stereo work special attention should be directed to the equality of the lenses and the diaphragms.

Outside the frame of the picture to be taken there should be placed a colour chart—the above-mentioned chart for instance—which not only serves for the control of the colour analysis but also prevents a later change of the negatives. These are generally so similar to one another that they can only be differentiated by very careful examination, whilst the colour chart appears very different and characteristic in each negative.

With solid objects the three negatives must be made as quickly as possible one after the other, not only because many objects, such as living flowers, are in continuous movement, but also because the ratio of light will alter, and then the gradations of the negatives will not be the same, and this may produce a marked alteration in the reproduction of the colours. This disadvantage, as well as the arrangement of filters above mentioned, induces one to use dry plates.

The plates for the exposures should be laid on the three dark slides, and each covered with its proper filter plate, film to film. As has already been mentioned, there should be used:—

1. An ordinary gelatine plate, covered with a colourless glass plate
2. An orthochromatic plate covered with a green filter; and
3. A cyanine bath plate covered with the orange filter.

As regards times of exposure the following data may be useful as a guide: For stereoscopic work in a studio the first plate should have three seconds, the second eight seconds, and the third fifteen seconds' exposure. The requisite ratio of exposure is, therefore, as 1:3:5.

There is, therefore, no difficulty of making the exposures all within one minute, and this time may, even in favourable circumstances, be reduced to half a minute. The potash-glycin developer with the addition of acid sulphite lye is the best to use.

Of special importance is the equal character of the negatives. In order to satisfy this requirement, it is advisable to place side by side with the colour chart three pieces of grey paper of different intensities, and to so expose and develop that this scale appears of equal density.

In no case ought fully exposed negatives to be tried, for then, if, for instance, the object contains much yellow, the negative for the yellow print will with correct exposure give the impression of an under-exposed plate, and it would be quite false to expose excessively long in order to obtain a well-worked-through negative. The absolute correctness of the negatives can only be estimated from the reproduction of the colour chart and the grey scale. If these are correctly represented, the principal object will also be right, and without these aids an estimation of the negatives as regards colour analysis and time of exposure is quite impossible.



## METALLIC PHOTOGRAPHS.

It is about two years since we referred to the charming method of photographic printing which the Metallic Photo printing Syndicate, of New Southgate, was formed to work and exploit. The results could not fail to excite admiration. The image, in brilliant pulverulent silver or gold, is transferred to a surface of polished mahogany, previously made black, and is subsequently treated and varnished in such a manner that the destructive agency of the most powerful acids has no effect on the picture, which may therefore be looked upon as possessing the elements of permanency in the highest degree.

The process since its first introduction has been considerably improved in its working details by Mr. F. Ahrlé, the managing director of the Company, and the latest specimens shown us possess a depth and richness of image which could scarcely be improved upon. Besides portraits, the process is well adapted for the reproduction of pictures, advertising plaques (sheets of ferrotype here constituting the support), and other purposes. Mr. Ahrlé tells us that, given suitable negatives, the best possible results are easily and inexpensively produced at his works.

Nothing could have a richer decorative effect in the house than a large portrait or reproduction of a picture with the image in bright silver or gold on a massive, highly polished ebony black support. Besides the element of permanence, these pictures have every good photographic quality, detail and gradation, light and shadow being perfectly rendered. We understand that these metallic photographs (in which the only fault we can find is their awkward name) are shortly to be brought very prominently to the notice of the public. We wish the process the very great commercial success it deserves.

## THE ENERGY OF RÖNTGEN RAYS.

SINCE the marvellous properties of the Röntgen rays were discovered very many experiments have been made to bear upon their application to physiology and surgery, says Dr. J. G. McPherson, F.R.S.E., in *Knowledge* for July. Dr. Poland's atlas of the development of the formation of the bones of the wrist from birth till seventeen years of age is one of the most startling of the recent successes of the process; and this has overturned to some extent the old theory of the formation of these bones.

There has been, however, as yet but little done to determine the energy of these rays. The Rev. Alexander Moffat, B.Sc., has been studying the subject in Erlangen, and has submitted to the Royal Society of Edinburgh the result of his investigations.

A. Rottl was the first to attempt to determine the duration of the Röntgen rays. He used a Ruhmkorff coil with a rotating interrupter to make and break the current in the primary circuit. On the interrupter he mounted a photographic plate, and in front of it had a screen of lead with a slit in it. The Röntgen rays were made to pass through the slit and make a photograph of it on the plate. From the amount of broadening of the photograph he found that the duration of a discharge was about  $\frac{1}{1000}$  second.

Dr. Trouton, of Liverpool, adopted the method of rotating a zinc-toothed wheel between the Röntgen lamp and photographic plate. A photo of the moving teeth was secured by making one interruption of the primary current in the induction coil, thereby letting one discharge pass. The duration of the radiation was determined by the departure from sharpness of outline of the photo; and he concluded that the duration of a discharge was from  $\frac{1}{500}$  to  $\frac{1}{1000}$  second. M. Colandeanu, adopting the same method, found the result to be about  $\frac{1}{1000}$  second.

M. Morize adopted Rottl's principle. He fixed the plate to one end of the axle of an electrometer, and at the other end he placed a toothed wheel which interrupts an electric current, and makes a contact which registers itself on a chronograph band. From the broadening of the image of the slit he found the duration of the discharge to be a little over  $\frac{1}{1000}$  second.

Mr. Moffat has now determined that this figure is far too low; in fact, he proves that the real duration is about a tenth part of that determined by Colandeanu and Morize. He used an optical bank, with a screen of barium platino-cyanide and the Röntgen lamp at one end, an amylacetate lamp, as a source of light, being at the other end to note the standard of comparison; between these was a movable photometer. In order to obtain as strong Röntgen rays as possible, he introduced an air spark into the circuit, thereby driving away the particles of dust in the air and making the discharge more sudden. The Röntgen lamp and the spark-interrupter were enclosed in a box, the lamp being fixed near one side. At the place where the rays from the anti-cathode were to be transmitted a small hole was bored and covered with thin black paper. On the other side of this paper the screen was fastened. In front of the screen was fixed a piece of cardboard with a small hole in it, and through this the light-emitting surface of the screen appeared.

The light from the test lamp had to be weakened, because the light proceeding from the screen was very faint. This was done by putting the lamp inside a wooden box. A hole was made in front of the box, and covered with translucent paper. In front of this was placed a piece of green glass. For a photometer he used simply two mirrors set at right angles to one another; in this way very little of the light was lost. To determine the quantity of light emitted by the translucent paper,

from the amyl-acetate lamp, he put at one end of the optical bank a lamp, and at the other end the box with the translucent paper thus illuminated. He found that the light emitted by the paper was one-twentieth of that of the lamp.

He then removed the translucent paper, and determined the extinction coefficient of the green glass by measuring the intensity of the light transmitted by them in comparison with that of the lamp alone. He found that the intensity of the light coming from the translucent paper, when weakened by transmission through the green glass, was about  $\frac{1}{10000}$  lamp.

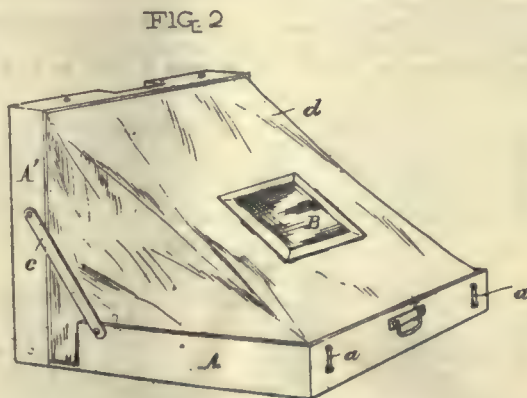
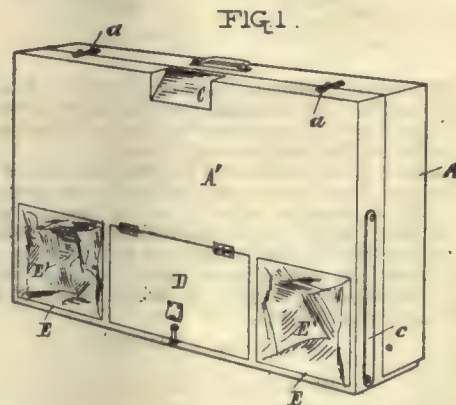
Now, the light of the lamp is emitted during the whole time it is burning, but the Röntgen rays only during very short intervals of time. To determine the upper limit to the duration of these intervals, Mr. Moffat put in front of the screen an opaque screen with a small vertical slit, and examined the image of the slit in a rotating mirror. The slit was three millimetres broad, and the mirror was exactly opposite it at a distance of 27.5 cm., revolving at the rate of about ten revolutions per second. Now, he saw that the image was broadened one-tenth part; accordingly, the duration of a discharge must have been about  $\frac{1}{2} \times \frac{1}{10} \times \frac{1}{10} \times \frac{1}{10} \times \frac{1}{10} = \frac{1}{10000}$  second.

By a series of successful experiments Mr. Moffat has averaged the duration of a discharge of the Röntgen rays at  $\frac{1}{10000}$  second. This, at least, is the upper limit.

## A NEW DEVELOPING AND CHANGING TENT.

M. DONNY, of Paris, has devised an apparatus of this kind in two parts, the one a base part, A, and the other a vertical part, A', which, when the apparatus is not in use, may be caused to be secured one to the other for convenient carriage by latches, a. The vertical part, A', is hinged to the base part, A, so as to be capable of being uplifted into a vertical position perpendicular thereto, the vertical part, A, being secured in that position by means of struts, c, laterally placed.

The parts of the apparatus are connected together by means of a light-proof covering, d, such as American cloth, velvet, or the like, which,

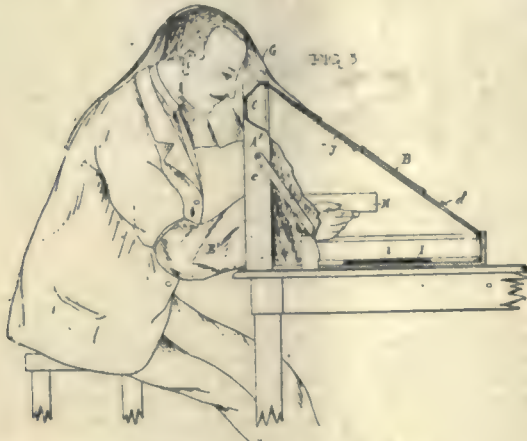


when the vertical part of the apparatus is uplifted into its vertical position, is stretched out so as to form triangular flexible sides and an inclined upper surface. Upon this upper surface a piece of glass, n, coloured, so as to be proof to actinic rays, is fixed, while upon the under side of this inclined surface a screen, z, is provided to slide or to be adjusted into any position so as to entirely cover the under face of the glass or partially cover it by manipulation from within the apparatus. Upon the upper



edge of the vertical part an ocular glass or plate, *c*, is provided, through which the interior of the apparatus may be viewed, while immediately beneath, a door, *d*, is provided to permit of the introduction of the frames, baths, and plates to be used. Upon each side of this door, apertures, *e*, are formed for the introduction of the fore arms, these apertures having connected thereto sleeves, *e'*, which are caused to encircle the arms of the operator, so as to preclude the passage of light while permitting of the fore arms being moved within the apparatus for the manipulation of the frames and plates therein.

A cover or cloth, *o*, is placed over the upper part of the apparatus, and over the head and shoulders of the operator, so as to exclude light from



penetrating through the ocular glass into the chamber. The plates to be operated upon, and the bath and frames are introduced through the door, *d*, and the screen or curtain, *j*, is drawn in front of the coloured glass, *b*, provided upon the inclined flexible cover, *d*.

For the purpose of convenience in manipulation of the plates, the developing basin, *h* (fig. 4), may be provided with a transparent bottom, *h*, and a cover, *i* (fig. 5), having a mirror, *i*, provided therein, so that, on the cover with its mirror being placed upon the bottom of the chamber, the light that is permitted to pass through the coloured glass, *b*, in the inclined flexible cover, *d*, is reflected by the mirror, *i*, through the transparent bottom, *h*, of the developing basin, *h*, so that the phases of development can be thus conveniently observed.

#### BECK'S VIEW-FINDER.

THE following description of Messrs. Beck's new view-finder is given by them in the patent specification:—

*A* is the body of the view finder, *B* is the mask or diaphragm having an aperture, *C*, of the same shape as the photographic plate or film, *D* is a positive object-lens or doublet lens of such a focus as to produce an

to the axis of the lens of the camera, the optical apparatus or eye lens, *E*, is placed behind and parallel with the mask, *B*, and directs the rays on to the reflector, *F*, which is placed behind the lens, *E*, and reflects the image, through the aperture, *C*, placed above it, to the eye of the observer.

In the view-finder, shown at fig. 2, the arrangement of object-lens, *D*, mask, *B*, and eye lens, *E*, is the same as in fig. 1; the reflector, *F*, is, however, dispensed with, and the viewing aperture, *C*, is placed immediately behind the eye lens, *E*. With this view-finder the image is viewed in a plane parallel with the axis of the camera lens.

In the view-finders shown at figs. 3 and 6, the object-lens, *D* (see fig. 3), is represented as a positive doublet lens, the mask, *B*, is placed at a suitable distance behind the object-lens, the mirror, *F*, is placed immediately behind the mask, and the eye lens, *E*, is placed above the mirror in the position of the viewing aperture, *C*, of fig. 1. This, the aerial image, formed by the object-lens, *D*, in the plane of the mask, *B*, is, by the mirror, *F*, reflected to the eye lens, *E*.

In the view-finder shown at fig. 4 the mirror, *F*, is placed directly behind the object-lens, *D*, and acts to reflect the image from the latter towards the mask, *B*, which is placed immediately above said mirror, the eye lens, *E*, being placed at the required distance above the mask, *B*, and quite close to the viewing aperture, *C*.

With the view-finders shown at figs. 3, 4, and 6, the image is viewed, like that shown at fig. 1, at right angles to the axis of the lens of the camera.

Referring to the view-finder shown at figs. 5 and 6, the mask, *B*, is shown fitted with a movable circular diaphragm, *K*, mounted with capability of rotating in the mask, *B*, and provided with a stud, *L*, engaging within a slot in a lever, *M*, to which the operating stud or button, *J*, is attached. The movable circular diaphragm, *K*, has an aperture, *C*, therein of oblong form, which, by means of the lever, *M*, can be placed with its long side either vertical or horizontal as may be required.

#### CINEMATOGRAPHY AT THE LAUNCH OF THE SHAMROCK.

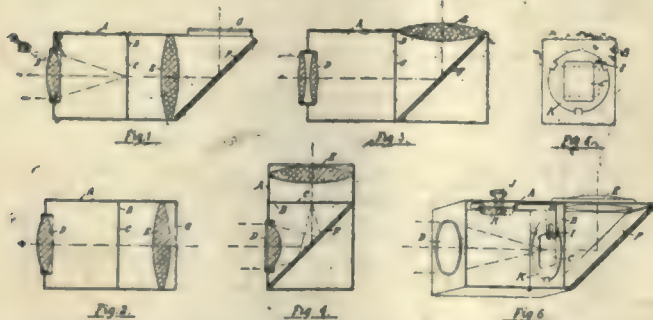
ONE of our morning contemporaries tells us that immediately before the launch of Sir Thomas Lipton's yacht nothing whatever of the *Shamrock* could be seen by the non-privileged, but every vantage point was seized upon, and row-boats went to a premium. Some of them were chartered by artists or photographers, and cinematograph machines were placed in position betimes, a short pier jutting out offering facilities that were not to be despised, whilst piles of timber baulks, with which the yard had apparently been barricaded, was crowned by another machine camera.

When the time came for the launch, the yacht travelled quickly down the ways, her orricle still holding her, and she entered the Thames, gliding gracefully and with perfect steadiness, greeted by the shrill whistles of the tugs and the cheers of every one who beheld her. It was not for a moment or two that the *Shamrock* settled down to her light draught, for the bow was still inclined at a sharp angle, until the cradle, heavily weighted with iron as it was, sank and broke up, and the yacht gained a level deck. Her crew—forty hands—were aboard, with Captain Hogarth and Captain Ring. Two busy tugs took her in tow, and she went towards Plough Wharf, out of sight, whilst a cinematograph operator, whose instrument had at the critical moment failed, cried, ruefully, "Will she not come back again?" To his satisfaction she did, and, as the *Shamrock* repassed, the panorama, with the moving shipping, the boats in the foreground, and the people on shore, was a pretty one, and not the least effective picture of the day.

#### WEATHER "FORECAST" FOR JULY AND AUGUST.

MR. HUGH CLEMENTS favours the readers of the *Morning Herald* with the following weather forecast for July and August. Perhaps some of our readers may like to amuse themselves by seeing how far Mr. Clements' forecasts prove correct: July, on the whole, will be a very fine month, excepting the 2nd, 7th, 8th, 16th, 21st, and 24th, which will be generally or variably cloudy, the other days of the month will mostly be fine, varying from partially cloudy to cloudiness. The temperature for July will be above the average, and it will be specially hot on the 11th, 12th, and 15th, and on the 26th I anticipate that the temperature will just fall short of 100 deg. in the shade. On the 6th it will also be pretty warm. The great heat on the 26th, 10th, 6th, and 2nd will probably be productive of electrical discharges or thunder showers.

August will not, on the whole, be so fine as July, due to the fact that the oscillatory movements of the atmosphere will be greater at London, and the barometer will fall lower on the 11th and 28th especially, and on the 5th, 7th, 19th, and 24th, causing unsettled weather round those dates and a lowering of the temperature. There will be unsettled weather and occasional showers from the 4th to the 14th, on the 19th and 23rd, and from the 25th to the 28th. August will be about sixty per cent. fine, and forty per cent. unsettled and showery. It will be fine from 1st to 3rd, August, 5th, 7th to 9th, 15th and 16th, 18th, 22nd, 24th, 29th, and 31st, and on the mornings of the 20th, 26th, and 27th, and on the night and morning of the 30th.



aerial image situated exactly on the plane of the mask corresponding to the image of the camera, *E* is an optical apparatus consisting of a positive or eye lens, which enables the observer to view the whole of the image at the same time, *F* is a reflector which is fixed at the required angle, those in the drawings being represented at 45°, to reflect the image to the eye of the observer, *C* is an aperture through which the image is viewed.

In the view-finder shown at fig. 1, for viewing the image at right angles



## DOES IT PAY TO BUILD LARGE TELESCOPES?

PROFESSOR GEORGE E. HALE, a noted American astronomer, answers this question by summarising the principal advantages of a large telescopic object-glass—forty inches aperture in the special case, as compared with a smaller one of ten inches.

These advantages consist:—

1. In the fact that the larger glass is capable of giving much brighter star images, and thus of rendering visible faint stars that cannot be seen with the smaller glass.

2. In the fact that it gives at its focus an image of the object enlarged in proportion to its greater diameter.

3. In its capacity to render visible, as separate objects, the components of very close double stars or minute markings on the surface of a planet or satellite.

The principal disadvantage of the large glass is that it demands better atmospheric conditions to bring out its best qualities.

He adduces several important astronomical discoveries, which have been made possible only with the aid of large glasses, viz., the discoveries of the fifth satellite of Jupiter and of the two satellites of Mars. Furthermore, the author declares that much fine detail, which he has never been able to see with the smaller glass, is "clearly and beautifully visible" with the forty-inch glass. Also, he states, micrometrical measurements are effected with much more ease and certainty with the large instrument.

"It is practically in astro-physical research that a great telescope is advantageous. It is necessary in spectroscopic observation to have as much light as can be gathered into a single point, and for this a large glass is essential. It follows from this that great telescopes have a mission to perform. While, on the one hand, they do not possess the almost miraculous gifts which imaginative persons would place to their credit, they do possess properties which render them much superior to smaller instruments, and well worth all the expenditure which their construction has involved."

## THE ROYAL PHOTOGRAPHIC SOCIETY'S SOIREE.

THE *Soirée*, by which the Royal Photographic Society signalled its entrance into possession of its new house, No. 66, Russell-square, was given on Tuesday evening last, when the President and Council received the members of the parent and affiliated societies and their friends, a very large number of ladies and gentlemen having accepted the invitations which had been sent out. The function was in every way most successful and enjoyable, and as one went from room to room of the spacious premises one heard quite a chorus of admiration and of good wishes for the future well-being and expansion of the Society, now that it has at last secured a habitation worthy of itself and of photography.

The reception took place in the Council Room, a fine apartment, in which, and in the adjoining Meeting Room, there was displayed a selection of photographs from the Society's permanent collection, in addition to which we noticed three or four very fine pictures by Mr. A. L. Witcomb, of Buenos Ayres, which had been kindly lent by the Argentine Legation. In these two rooms there were met together almost everybody whose names are known in photographic circles, not only in London and the provinces, but also in the Colonies, the United States, and on the Continent, including many ladies. In addition to the Right Hon. the Earl of Crawford, K.T. (President), Messrs. T. R. Dallmeyer, and Chapman Jones (Vice-Presidents), G. Scamell (Hon. Treasurer), Colonel Waterhouse (Hon. Secretary), and R. Child Bayley, T. Bedding, T. Bolas, C. H. Bothamley, F. A. Bridge, W. E. Debenham, A. Haddon, Rev. F. C. Lambert, A. Mackie, J. W. Marchant, J. A. Sinclair, J. J. Vezey, and H. Snowden Ward (Members of the Council), we were able to note the names of the following, who were to be seen among the crowd who thronged the rooms and staircases: F. E. Emerson of Sydney, N.S.W., Paul Ponge (of the firm of C. P. Goetz), W. F. Carlton and E. Bausch (of Rochester, N.Y.), A. Horsley Hinton, Mrs. Snowden Ward, Mrs. Isabella Bishop, Dr. and Mrs. Charters White, Sir Benjamin Stone, M.D., H. Wilmer, F. Seyton Scott, J. McIntosh, A. W. Isenthal, Leslie Clift, E. Clifton, W. Gamble, Rev. C. J. Moncrieff-Smythe, Mr. and Mrs. Hutton Smith, J. C. S. Mummery, T. Manly, B. Speaight, W. Thomas, A. W. Penrose, Redmond Barrett, W. Wray, H. T. Malby, J. D. Mason, R. W. Craigie, E. Calland, Craig Annan, F. H. Williams, F. Ince, Edgar Scamell, E. W. Foxlee, J. J. Elliott, Sanger Shepherd, Sebastian Davis, Mrs. J. Spiller, Messrs. A. L. Spiller, Birt Acres, H. Vivian Hyde, P. B. Salmon, F. Seary, T. E. H. Bullen, W. D. Booker, J. S. Teape, Vandendriesche, R. P. Drage, Mr. and Mrs. Walter Maunder, Messrs. John Leighton, Drinkwater Butt, Amstutz, W. P. Dando, S. H. Fry, Farmer Hall, T. E. Freshwater, Mr. and Mrs. F. H. Mercer, Messrs. P. Everitt, I. Herbst, F. A. Bolton, J. H. Agar Bangh, C. Vandyk, C. S. Glass, O. Sichel, A. E. Dean, and A. S. Handford.

In the Meeting Room a selection of music was admirably rendered by the quartette band, and something of interest was provided in almost every other part of the premises. Mr. J. R. Gotz demonstrated the use of fluorescent screens in X-ray work, which proved a very attractive item, the ladies especially evincing a great deal of interest in the subject; and, in another room, an exhibition of microscopes, by Messrs. B. & J. Beck, drew many visitors, a number of wild-flower blossoms—buttercups, white

nettle, fool's parsley, dandelion, &c.—forming very beautiful objects for examination. Dr. Mackenzie Davidson's devices for stereoscopic radiography received considerable attention; and Mr. Friese-Greene, who demonstrated a method of printing without pigment or ink, introduced by the Electrical Inkless Printing Syndicate, Limited, was constantly surrounded by a throng of interested spectators. Mr. T. R. Dallmeyer's focometer was displayed, together with some old apparatus, and examples from the Society's museum, all of which were subjected to much scrutiny. The convenient dark-room and laboratory accommodation on the third floor was inspected by many of the visitors, and the library on the ground floor, where refreshments were served, was not empty.

The affair was altogether of a most pleasurable and satisfactory nature, and will, we hope, prove to be the inauguration of a period of increased success and usefulness for the Society.

## Our Editorial Table.

## LATEST VELOX INTRODUCTIONS.

MESSRS. GRIFFIN have added to their list of Velox specialities a special rough double-weight Velox, which is designed to further expedite the ready production of finished photographs. Special Velox emulsion is coated on pure white boards of sufficient thickness to obviate all necessity for mounting, and the prints made thereon present a finished appearance as soon as they are dry. It is pointed out that with double-weight Velox no curling takes place while in the solutions, and the card is handled with greater comfort than is the case with paper prints. The card prints may be carried loosely in the pocket, or for insertion in the slip-in albums. It is also pointed out that the picture is shown more effectively than with prints mounted in the usual manner, the detail being well thrown up by the perfect contact between image and card.

Velox post cards, consisting of post cards (accepted for transmission in the Postal Union), coated with special Velox emulsion, are another speciality. Messrs. Griffin observe that pictorial post cards are now becoming so popular that many who prefer the delicate tones associated with Velox will welcome this new means of embellishing their correspondence. The manipulations of the new papers are the same as with ordinary Velox.

With the title of the "Champion," Messrs. W. Boughton & Sons, Limited, of Thetford, Norfolk, are issuing a postal wrapper which may be used for sending photographs securely and safely through the post. The "Champion" wrapper is a capital one for the purpose.

PHOTOGRAPHERS who are fond of the Thames above Putney will find *The Royal Thames Guide* an invaluable book to have at hand on their excursions. It contains thirty-five diagrams from lock to lock, over one hundred illustrations of scenery, and a vast amount of local and historical information. It is published by Simpkin, Marshall, & Co., price 1s.

MR. PERCY LINDLEY, of 30, Fleet-street, E.C., sends us an early copy of the Great Eastern Railway Company's booklet, entitled *A Channel Fleet*, descriptive of the steamers now running upon the Royal Mail (Harwich) route, and also of some of the more popular Dutch, German, Swiss, and Norwegian tours arranged for this season, *via* Harwich and the Hook of Holland. From the same source we have also to acknowledge receipt of the Company's new booklet, entitled *Holidays in the Old Flemish Cities*, by Percy Lindley, describing new inexpensive holidays, *via* Harwich and Antwerp, in Flanders and the Ardennes. Both little books are fully illustrated, and the descriptive reading matter is terse and to the point. The enterprise of the G. E. R. in issuing such capital guides to short Continental holidays should, and doubtless will, find its reward in inducing large numbers of tourists to avail themselves of the excellent facilities which the Company have devised for the convenience of tourists and travellers.

## News and Notes.

MR. WILFRED EMERY, the well-known photographic dealer, trade enlarger, &c., of Soho-street and Dyne-road, Brondesbury, recently met with a very severe bicycle accident, the result of a flaw in the machine. Although badly shaken and knocked about at the time, he has now recovered, and is attending to business as usual.

UTILISATION OF SOLAR HEAT FOR POWER—Professor L. G. Carpenter, Fort Collins, Col., presented, at the late meeting of the American Association in Boston, the results of some interesting observations, continued during ten years, of the amount of solar energy received on the Western plains. These observations show an intensity of from seven to seventeen calories per square metre, from eight a.m. on sunny days. This is equivalent to from one-half to one-quarter horse power per square yard. It appears also to be as reliable as the wind, which is exclusively used as a source of power for small plants.



"THAT," cried the great painter ecstatically, as he surveyed his daughter's first attempt with a camera, where the cow was blurred into the rail fence, and the rail fence was blurred into the apple orchard, and the apple orchard blurred into the landscape generally, "that, my dear child, is not photography—that is art!"—*Puck*.

**HACKNEY PHOTOGRAPHIC SOCIETY.**—Meeting on the 20th inst., Mr. F. W. Gosling presiding.—Mr. E. H. Dunmore showed the Tellia hand camera, which was much admired by all who saw it. It is a very fine little instrument and possesses all necessary movements besides being very light and compact. The method of changing the films is very ingenious. Excursion reports and announcements were then made, and the rest of the evening was given to the examination of the excursion competition prints and the Judges' criticism thereon.

SOME Scotland-yard officials, says the Exchange Telegraph Company, have made an important discovery at the residence of a suspected forger in Camberwell. An Austrian, who has been living at Champion Hill, was recently arrested at Marseilles on a charge of uttering a quantity of forged 100-ruble Russian notes, and is now awaiting trial. At his house in Camberwell alleged incriminating documents have been found, together with extensive photographic apparatus. He is suspected of being concerned in the forgery of bank notes of the Bank of England.—*Daily Chronicle*.

THE Fourth Annual Exhibition of the Hove Camera Club will be held at the Town Hall, Hove, on December 7, 8, and 9, 1899. The open classes are: A, for pictures (any subject) which have previously gained an award; B, for pictures (any subject) which have not gained an award; C, lantern slides (any subject) in sets of four; D, for a set (or sets) of four prints by exhibitors who have never gained an award. There will also be seven Club classes. Prospectuses will be ready in October, and copies will be sent in due course upon application to Mr. C. Berrington-Stoner (Hon. Secretary), 24, Holland-road, Hove.

AN extra summer number of the *Studio* will shortly be ready, containing not only the text of the masque entitled "Beauty's Awakening," recently given before the Lord Mayor at the Guildhall, but also illustrations of a large number of the designs for the beautiful costumes, stage accessories, &c., which have been specially made for this unique undertaking by the most prominent members of the Art Workers' Guild. A feature of the number will be the numerous supplementary illustrations, consisting of coloured plates, original etchings, and lithographs, by Walter Crane, William Strang, Henry Wilson, C. R. Ashbee, T. R. Way, and others.

**DRAWINGS ON GLASS.**—Drawings cannot be made on tin or the smooth surface of glass, therefore some substance has to be applied to the surface that will render it sufficiently rough to allow the pencil marks to appear. The best material to use is a varnish prepared either from sugar or from the ingredients mentioned in the second formula given below. Sugar varnish for giving a matt surface to glass is prepared by dissolving equal parts of white and brown sugar in water to form a thin syrup, and then adding a little alcohol, and apply to the glass plates after having heated them. The film dries very quickly, and easily allows pen or pencil to be used on it. The best ink to use is Indian ink rubbed up in sugar and alcohol. To render the drawing permanent; lay over it also or mastic varnish.

**SOCIETY OF ARTS MEDALS.**—The Council of the Society of Arts have awarded the Society's silver medal to the following readers of papers during the session 1898-99: Professor George Forbes, F.R.S., for his paper on "Long-distance Transmission of Electric Power;" C. H. Bothamley, F.C.S., "Photographic Developers and Development;" Dixon H. Davies, "The Cost of Municipal Enterprise;" James Swinburne, "Nernst's Electric Lamp;" J. H. Collins, "Cornish Mines and Miners;" Philip Dawson, "Electric Traction;" Walter Hunter, M.Inst.C.E., "London's Water Supply;" Sir W. H. Preece, F.R.S., "Etheric Telegraphy;" Colonel R. Carnac Temple, C.I.E., "The Penal System at the Andamans;" Sir John Scott, "Judicial Reforms in Egypt;" Archibald Little, F.R.G.S., "The Yang-tse Basin and the British Sphere;" Stephen Webb, "Intarsia, or Inlaying;" J. Starkie Gardner, F.G.S., "The Revival of Tradesmen's Signs."

**COMPRESSED OXYGEN FOR COMBUSTIONS.**—The use of compressed oxygen in elementary organic analysis is recommended by F. G. Benedict and O. F. Tower (*Journ. Am. Chem. Soc.*, 21, 390), who find that this modification materially shortens the process in making carbon and hydrogen determinations. The compressed oxygen supplied in steel cylinders is comparatively dry and free from carbon dioxide, so that its purification is easy to accomplish. The carbon dioxide is absorbed by soda lime in a small U-tube, one such tube sufficing to remove the impurity completely for more than twenty-five combustions. The gas is next passed through a drying apparatus consisting of a cylinder about 12 cm. high, half filled with concentrated sulphuric acid, through which the oxygen bubbles, thereby indicating the rate of flow. A small U-tube containing pumice stone drenched with sulphuric acid is used to retain any remaining trace of moisture. As the gas enters the combustion tube its flow must be regulated. A rubber tube, leading from the cylinder, connects with a T-tube, one end of which dips one inch under mercury in a small bottle fitted with a rubber stopper having two holes, the second of which is left open. The other end of the T-tube is connected by a rubber tube to the purifying apparatus, which is, in turn, connected to the combustion tube by rubber tubing furnished with a pinch cock. On opening the cylinder valve slightly the oxygen flows out and, passing through the driers, produces a bubbling in the sulphuric acid cylinder. The pinch cock is now closed until the desired rate of flow is obtained, any excess of gas escaping through the mercury trap, and the cylinder valve is finally adjusted so as to prevent any appreciable loss of oxygen.

## Patent News.

THE following applications for Patents were made between June 12 and June 17, 1899:—

- APPARATUS.**—No. 12,276. "Improvements in Photographic Apparatus." E. J. CLIFFORD.
- PACKING CHEMICALS.**—No. 12,337. "Improvements relating to the Packing and Dispensing of Minute Quantities of Photographic Chemicals." J. J. GRIFFIN & SONS (Limited) and F. H. IBBETSON.
- DEVELOPING WITHOUT THE USE OF A DARK ROOM.**—No. 12,371. "Improvements in and relating to Means for the Development and Sensitising of Photographic Plates, Papers, or the like without the Necessity of the Dark Room." S. QUINCEY.
- DIAPHRAGMS.**—No. 12,416. "Improvements in Diaphragms or Stops with Variable Apertures for Objectives applicable for Photography and the Projection of Pictures." Communicated by M. Radais and M. Stiasnie. W. P. THOMPSON.
- STORING PLATES AND FILMS.**—No. 12,441. "Improvements in the Mounting, Storing, and Manipulation of Sensitised Plates and Films, and in Apparatus connected therewith." J. E. THORNTON.
- ANIMATED PHOTOGRAPHY.**—No. 12,497. "New or Improved Method and Means of Changing (either rapidly or otherwise) the Sensitive Surfaces in Taking Photographs or for Displaying the Views in Rapid Succession in Animated Photography or the like." R. H. EDWARDS.
- ANIMATED PHOTOGRAPHY.**—No. 12,511. "Improvements in the Means and Apparatus for Reproducing Animated Scenes by Projection on to Screens or Surfaces." Communicated by the Société Internationale d'Etudes Industrielles, France. C. D. ABEL.
- LIGHT-FILTERS.**—No. 12,515. "Improvements in the Manufacture of Selective-colour Light-filters for Photographic Optical Purposes." G. SELLE.
- COLOUR PHOTOGRAPHY.**—No. 12,516. "Improvements relating to the Sensitising and relative Sensitive Adjustment of Photographic Plates or the like for use in Colour Photography, and to the Measurement of Time Exposure of said Plates." G. SELLE.
- COLOUR PHOTOGRAPHY.**—No. 12,517. "Improvements in the Formation of Films for Use in Colour Photography." G. SELLE.
- CAMERAS.**—No. 12,580. "Improvements in Photographic Cameras." G. HURKA.
- PRINTING PAPER.**—No. 12,585. "Improvements in Photographic Paper adapted for Printing Out and other purposes." Communicated by A. Schwarz. THE ROTARY PHOTOGRAPHIC COMPANY (Limited).
- CAMERAS.**—No. 12,623. "Improvements in or relating to Photographic Cameras." A. D. WILLIS and L. W. MENCH.
- CAMERAS.**—No. 12,644. "Improvements in Cameras." J. E. THORNTON.
- TINTING PHOTOGRAPHS.**—No. 12,678. "An Improved Method of Tinting Photographs." Complete specification. T. T. BAKER and M. S. BERGER.
- X-RAY METROSCOPE.**—No. 12,685. "An X-Ray Metroscope." E. W. H. SHENTON and A. E. DEAN.
- POCKET CASE.**—No. 12,698. "Photographic Utensil Pocket Case." Communicated by A. V. C. Mayall. Complete specification. H. H. LEIGH.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
3.....	South London .....	{ Some Methods of Control in Photographic Printing G. J. T. Walford.
4.....	Gospel Oak .....	{ Cloud Photography C. Stone.
5.....	Oldham .....	{ Excursion: Lichfield. Leader, W. A. Nash.
5.....	Photographic Club .....	{ Binocular Vision and the Stereoscope Thomas Bedding.
8.....	Ashton-under-Lyne.....	{ Excursion: Ripon and Fountains Abbey Leader, The President.
8.....	Hackney .....	{ Excursion: Ladies' Day. Leaders, The President and W. F. Fenton-Jones.
8.....	Kingston-on-Thames .....	{ Excursion: Leatherhead to Box Hill Leader, O. Holford.
8.....	Liverpool Amateur.....	{ Excursion: Nant-y-Frith or Farndon.
8.....	South London .....	{ Excursion: Wanstead Park. Leader, G. Brown.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 22.—Mr. R. P. Drage in the chair.

The first business of the meeting was the nomination of officers and Committee for the ensuing session. The names proposed will come up for ballot at the next meeting, with certain notices of alteration of rules for consideration.

Messrs. F. Kellow and H. C. Rapson were appointed Auditors of the accounts. Mr. T. E. Freshwater was elected to fill the post of Delegate to the Affiliation vacated by Mr. E. Bayston, Mr. S. H. Fry being the other delegate.

A hearty vote of thanks was conveyed to Mr. A. L. Henderson for his hospitality of the previous week on the occasion of the garden party at his house at Brimsdown.



Mr. A. L. HENDERSON related that in a prescription which he had recently had prepared there occurred the name of a substance called lysidine, a preparation by Professor Ladenburg, of Germany. He found that the liquid was very much like caustic soda or potash, and it occurred to him that it might serve as the alkali in pyro development. A solution of—

Pyro.....	4 grains,
Water .....	2 ounces,
Lysidine .....	3 drops,

was made up, and found to answer admirably, no sulphite being used to keep the solution clear. After use, the mixture was left in an open measure for some time, but it only turned to a pale sherry colour, without, he believed, losing in developing power.

Mr. PHILIP EVERITT spoke of the new platinum paper Platona, which he thought would be welcomed. He had tried the new paper against the old, and passed round two prints, between which, however, it was difficult to find any difference, although the platinotype print had been made some nine years. Not having any potassium phosphate at hand for the development of the platona prints, he used a cold ten per cent. solution of oxalate of potash.

Mr. S. HERBERT FRY said that some tests which he had made with the new paper against the English and Jacoby's German paper were quite satisfactory.

Mr. J. S. TRAFFE drew attention to some notes by Professor Namias, published in a recent letter to this JOURNAL, in which the use of permanganate of potash and sulphuric acid in dilute solution as a reducer was mentioned. It was found that the action was analogous to that of persulphate of ammonium, but there was no ground to suppose that the silver was deposited on the image. Mr. Teape made up a solution which, while acting as expected, produced a stain. It was then modified to the following proportions:—

Permanganate of potash .....	3 grains.
Sulphuric acid.....	20 minims.
Water .....	24 ounces.

This bath effected a considerable reduction in the dense parts of the image before touching the weaker portions, and only slightly tinged the plate.

A discussion took place regarding the developer kachin and its power of working satisfactorily in combination with the hyposulphite fixing solution. In response to a suggestion that it was not, or likely to be, a practicable method of developing and fixing together, Mr. CHILD BAYLEY said that he had exposed as for ordinary development, with separate fixing, a number of plates, which he developed and fixed together in this way, and the results were in every way as good as he should have expected in the more orthodox manner.

Mr. HENDERSON, in the course of some comments upon the innovation, said that some plates contained more iodide than others, and in the ordinary way took a long time to fix. A mixture of hypo and cyanide of potassium greatly accelerated the fixing, the latter ingredient more easily dissolving the iodide salt.

#### PHOTOGRAPHIC CLUB.

June 21.—Mr. F. A. Bridge in the chair.

An interesting book with some well-executed collotypes of scenery on the route of the St. Gothard Railway, by MM. A. Berger et Cie., of Nancy, was passed round for examination.

Mr. John Nesbit showed a stereoscopic pair of negatives taken on rollable film, and afterwards separated and mounted in the correct position for printing, without any subsequent cutting being required. He wished to know how best the films could be stuck upon the final glass support, about which there was some difficulty.

The claims of gelatine were investigated, but thought wanting, and it was thought that some alcoholic varnish or cement that would bond with the celluloid of the film as well as with the glass would answer best, dilute shellac varnish being named as probably likely to serve.

North Middlesex Photographic Society.—June 19, Mr. H. W. Bennett in the chair. Mr. J. McIntosh gave a demonstration on

#### REVERSED NEGATIVES BY MEANS OF PERSULPHATE OF AMMONIA.

The method of procedure was briefly thus: A dry plate is placed in contact with the negative of which a reverse is required, and exposed about twice as much as if a good transparency was desired. The development is carried on until the image is right through the back, rinsed, and placed in a five per cent. solution of persulphate of ammonia until the metallic silver is completely removed. It is then placed in a solution of sulphite of soda for a few seconds to free it from the persulphate, and the bromide of silver remaining on the plate is reduced by development as in the first operation. It is then safer to immerse in hypo to remove any traces of bromide unreduced, as it would change in the light. All the operations after the first development may be conducted in daylight. This method would appear, if properly carried out, to give a better and truer rendering of the gradations of the reproduced negative than either the method of stripping the film and transferring, or by excessive exposure of a dry plate, to secure reversal, i.e., a negative from a negative. Mr. Macintosh carried through the demonstration very successfully. For the developer he used the newest reagent for that purpose, kachin, which gave a pleasing image of a brown-black colour, and did not stain like metol, &c. The negative used was one developed and fixed in one operation, metol being the developer.

Bath Photographic Society.—The second excursion of the season took place on Saturday, June 17, to the picturesque town of Malmesbury. The party travelled by the Great Western Railway, arriving at the splendid pile of Abbey ruins shortly before three o'clock. Without delay the streets, usually of a quiet character, became a scene of bustle and interest, for the Bath Photographic Society had captured the town and were busy securing views from

every advantageous point. Cameras and paraphernalia were everywhere in evidence. The Abbey contains very good examples of Norman work, especially the great arch (north-east) and the south door. Examples of Transitional and Gothic are likewise plentiful. History relates of the Abbey, dating from the seventh century, that founded in 680 by Alhelm, after a long period of much usefulness, it fell, at the dissolution, into its present state of decay. A fine Market Cross—a useful lounge for the lazy—was built in the reign of Henry VII. Henry VIII. sold the Abbey property to a clothier named Stump, who is reported to have used it as weaving workshops, and afterwards presented a portion to the town for the purposes of a parish church. Several interesting photographic subjects are situated close to the Abbey, including an Elizabethan house and other ancient buildings. The streets, too, are of a type conducive to picture-making. A successful afternoon's work was followed by tea at the King's Arms.

Bolton Mutual Photographic Society.—June 23, Mr. J. Phetheau presided.—The object of the meeting was to have a social chat and compare notes over the summer rambles, with a view to make them as attractive as possible. The Society's trip to Chester was definitely fixed for Wednesday, July 19. A letter was read from the Hon. Secretary (Mr. T. H. Heyes), tendering his resignation on account of ill health. It was accepted with regret, and a resolution passed thanking him for his past services, and hoping he would be speedily restored to health. Mr. A. W. Roscoe was appointed Secretary until the annual meeting in October.

#### FORTHCOMING EXHIBITIONS.

1899.

Sept. 22–Nov. 4 ..... Photographic Salon. Hon. Secretary, R. W. Craigie, Dudley Gallery, Piccadilly.

„ 25–Nov. 11..... Royal Photographic Society. Hon. Secretary, Colonel J. Waterhouse, 12, Hanover-square, W.

October 18–24 ..... Croydon Camera Club.

„ 22–Nov. 19... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.

#### Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### THE CONVENTION—A DARK ROOM AT DISPOSAL.

To the Editors.

GENTLEMEN,—As the Annual Convention of Photographers will shortly take place at Gloucester, will you allow me space to say that I shall be pleased to place at the disposal of any friends who may visit Stroud on that occasion a dark room at one of my studios for changing plates, &c. Stroud is twelve miles from Gloucester, and is noted for its magnificent scenery, and is approached from Gloucester by Midland and Great Western Railways. I shall also be pleased to point out places of interest in and around Stroud worth photographing.—I am, yours, &c.,  
Lansdown and Rembrandt Studios, Stroud. JOSEPH SMITH.

#### “FREE LANCE” AND MR. EVERITT.

To the Editors.

GENTLEMEN,—I am really disappointed in Mr. Everitt. His defence of his dictum that it was possible to get a picture of the hair of a galloping horse in one five-hundredth of a second resolves itself into a suggestion that the animal should be taken “end on.” And this, too, after I had classed him and Mr. Ruskin together as dialecticians! Mr. Everitt is by way of being a judge of wit, but we have here cunning, not wit, and one wonders why he intervened at all in the original debate if his dictum had no more value than he now shows it to have. I suppose his remarks about a galloping pace are intended to be humorous. I gave him every opportunity, by not over-pacing his horse, of qualifying his statement without making the present ignominious surrender; but I am quite prepared to show that a horse—let us say a hunter—that could for long follow the hounds at such a speed would be a “clinker.”—I am, yours, &c., FREE LANCE.

#### PHOTOGRAPHS REGISTERED:—

F. C. MacMahon, 23, Academy-street, Inverness.—Photograph of Scottish terrier dog

H. Vert, 67, High-street, Dudley.—Three photographs of the Gues' Hospital, Dudley.

A. G. Bolwell, 28, New King-street, Bath.—Cabinet photograph of E. Thorold, Esq., M.A. (deceased).

J. W. Wale, Wellington House Studio, West Hartlepool.—Two cabinet photographs of John T. Taylor.

G. W. West, The Studio, Rottingdean, near Brighton.—Photograph of the home of the late Sir Edward Burne-Jones. Photograph of the residence of Mr. Rudyard Kipling, Rottingdean. Photograph of St. Margaret's Church, Rottingdean.



## Answers to Correspondents.

- \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.
- \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.
- \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

RECEIVED.—F. DANKS; AMATEUR; P. RAYNER; J. WHEELER; INTAGLIO; R. A. BREMAN; and others. In our next.

A. UNDERHILL.—The address is Great Windmill-street, W.

T. T.—1. Dissolve 1 grain of gold in every 100 minims of water, and the bath will contain 12 grains. 2. Twenty-four hours. 3. Yes.

T. G. G.—We do not think your friend need have any fear of the firm's threats. Unless there is a stamped agreement, there is no ground for an action.

DAGUERRETYPE.—EXPERIMENTALIST. We cannot say where you will be able to obtain Daguerreotype plates at the present time. No one has stocked them since that process died out.

DIFFUSION OF FOCUS.—S. MARCHMONT. The portrait stigmatic lens of Dallmeyer is provided with the means of introducing spherical aberration, "diffusion of focus," at will, the same as with the other portrait combinations.

OLD PLATES.—W. NIEL. The two plates sent show that they are very old, and are practically worthless. This is a risk that must always be run in buying "job lots." Of course, under the circumstances, the makers of the plates are not held responsible.

LENS FOR HAND CAMERA.—T. WATSON. The only way to obtain pictures with a wider angle is to use a lens of shorter focus. A lens of six-and-a-half-inches focus is long for a quarter-plate hand camera. Get one of five-and-a-half-inches or shorter focus.

STAINED PRINTS.—B. & Co. The stains are most undoubtedly caused by carelessness in the work, whatever your printers may say to the contrary. Why not, to some certain extent at least, supervise the work yourselves? You would then see where the fault lies. That, of course, we cannot indicate by merely seeing two or three prints with stains upon them.

MOTTLED ALBUMEN PAPER.—H. A. The reason the paper prints mottled is that the bath upon which it was sensitised was too weak in silver for the amount of chloride in the paper; or it was not floated long enough upon the solution. If you sensitised the paper yourself, increase the strength of the bath by at least ten grains of nitrate of silver to the ounce.

TONING DIFFICULTY.—T. WADE writes: "I cannot get my prints to tone. They will not tone at all, no matter how long they are left in the bath. I use the acetate bath, and have had no trouble till just lately. I have always used an enamelled-iron dish for the solution, and the other day I noticed that the enamel was cracked in places. Do you think that has anything to do with it?"—No doubt, it has all to do with it. The exposed iron reduces all the gold there is in the solution.

HERBERT NORRIS.—If you send our publishers 1s. 7d. and three prints of the subject to be registered, they will do the useful for you. The words, "By Royal Appointment," can only be used if you have a royal warrant, which you have no chance of obtaining. "Distinguished patronage" is a meaningless phrase, which anybody can use. Coats-of-arms are matters for the Herald's College. Take our advice, and don't bother your head about such things; they do not help you in business one jot.

COPYRIGHT.—R. W. B. If the photograph is copyright in Germany, and there is little doubt it is, it is also copyright here, although it is not registered at Stationers' Hall. Under the International Copyright law, any picture made copyright in Germany, or other countries to the Convention, become, as a matter of course, copyright in England; also, any picture made copyright in this country becomes also copyright in other countries. Hence, you see, it would be illegal to reproduce any of the photographs in question.

COPYRIGHT.—H. A. WARD writes: "I have to photograph the interior of a large room, on the walls of which are several engravings, framed, that I know are copyright, and they will show in the picture if they are left where they are. If they are removed, the room will not look as when the meetings are held in it, and that is what the Society want specially. Will you kindly advise me on the subject?"—So long as the object of the photograph is only to show the room as it is, and not to make a distinct reproduction of the engravings, there will be no infringement of the Copyright Act.

ENLARGING.—NOVICE writes: "I want to enlarge some of my quarter-plate hand-camera negatives on bromide paper, using the light from a north window that I have blocked up for the purpose. I want to make the enlargements from whole plate to 12x10, none larger. Will you please say what size condenser I should get, and how it should be fixed at the window?"—No condenser is required, it would be useless. Simply fix the negative up at the window, or the opening left, with a piece of ground glass an inch or two behind, and reflect the light upon it by means of a sheet of white cardboard placed at an angle of 45° outside.

BOOK OF VIEWS.—W. C. BAX asks: "Can you tell me the best way to go about making a book of views—about half a dozen—so that the book can be opened and the views brought out in a line? Where could I get the covers? What process and manipulation, and probable cost of each, quarter-plate size? Should be glad of any information your experience can supply me."—In reply: You might obtain the covers from Marion & Co. We should recommend you to have half-tone blocks made, cost about 10s. each. Printing and paper you would have to get contracts for. We should advise you not to attempt the work yourself.

HALF-TONE ETCHING.—AJAX says: "I want instruction in the use of the ruled screen in taking photographs for making blocks from. Can you tell me of a book on the subject; also where can I buy such a screen? I do not find it mentioned in the lists issued by any of the dealers in photographic goods. I think the subject has been dealt with in the JOURNAL, but I cannot find the reference."—In reply: Suitable screens may be obtained from Messrs. Mawson & Swan, Soho-square, W.; Penrose & Co., Upper Baker-street, W.C., and other firms. *The Half-tone Process*, by Verfaesser, published by Percy Lund & Co., Bradford, would be a suitable text-book.

BOOKS WANTED.—INQUIRER asks: "Will you be so kind as to let me know, through the columns of your valuable paper, of a thoroughly practical book on photographic chemistry, which does not go too deep for one who has practically no knowledge of chemistry, though a fair acquaintance with the common photographic manipulations? I should also be very much obliged to know of one dealing with the most-used printing processes in a way suited to one who wishes to become a good all-round printer from a professional point of view."—In reply: Leaper's *Materia Photographica*, Townsend's *Chemistry*, Abney's *Instructions* should give you the desired information.

ENLARGING.—H. TOPPING writes as follows: "I want to enlarge some half-plate negatives to 12x10 on bromide paper, using daylight from a north window. I have only two lenses that are large enough for the work; one is a portrait lens of about ten inches' focus, the other is a Dallmeyer Stigmatic, Series II., of nine inches focus. Which of the two would be the best to use? I fancy the portrait lens would be the quicker."—Use the Stigmatic, because it has a flat field, with even illumination to the corners. The portrait lens would be the quicker if used with its full aperture, but then it has a round field, also it will not yield even illumination from the centre to the edges of the picture.

DISCOLOURED OPALS.—GORDON says: "I here enclose an opal picture, which, you will see, has become blue all over the shadows and brown and smoked-like more or less over all the figure. I do a considerable number of opals, and lately a few of those which I have done from two to four years ago have been brought back to me in a similar state to this one; some of them even a good deal worse with this blue and brown fog. I will be extremely glad if, through your paper, you can throw any light upon the probable cause of it, as I am very much annoyed and it is a very serious matter, affecting the permanency of my work, as, however careful I am, I do not know what one may go wrong this way. I have not seen or heard of any of them changing this way in less than two years, but those which do go wrong gradually get worse, until they are quite useless. They are developed with rodinal, and thoroughly fixed and washed. I do not use any acid after development, as they do not seem to require it, being quite pure in the whites. Do you think being dried along with negatives, standing high up on a rack in the dark room, with a small jet of gas fixed six feet below, could possibly have any effect upon them? Of course, it is not for the drying of them I use the gas, but for the negatives."—In reply: A very likely cause is imperfect fixation; but in these instances the pictures may have been kept in an atmosphere charged with gaseous impurities, which have attacked the image.

STARTING IN BUSINESS.—GIPSWY writes: "1. I have purchased a small plot of ground on which to erect a house and studio and permission to erect a shop for the sale of photographs and 'things legitimate to a photographic business only.' Of course, I want to sell everything I legally can. This is a seaside village. I can sell photographs, picture frames, the various printing papers, mounts, plates, and things of this kind. As I am a stranger, perhaps you could tell me a few other things that could be sold. Could I have an apartment agency and circulating library, as I should not sell anything, or a mutoscope placed outside the shop door? I shall be glad of any information. 2. Can you tell me the best book on photogravure? Can the art be learned from a text book, and learned by a woman? Is the first outlay expensive? I wish to issue some cheap guide books, and thought this process could be adapted for the purpose. 3. How should I get in touch with plate and paper-makers? Should I write them, or do travellers call? 4. I should like to get a letter of thanks for photographs from the Queen, as this is a draw with many people. I see one photographer near by has some, but I sent two or three sea studies to the Queen, and had them returned with letter to say the Queen was unable to receive presents of this kind. Is it of any use to try again? If so, in what way?"—In reply: 1. We suggest that you study the advertisements of our ALMANAC for 1899. These refer to goods which we should consider legitimate to a photographic business. By all means have a mutoscope. 2. Denison's book, published by Iliffe & Co., 3, St. Bride-street, E.C. It should be supplemented by practical instructions. For cheap guide books the half-tone process would be best. We should not recommend you to take up photogravure for the purpose. 3. Write them. Their addresses are given in our advertisement columns week by week. 4. Useless trying unless you have something of very special interest to send Her Majesty. Write again if we can be of further help.



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## EX CATHEDRA.

IN the course of the present summer, a new book on Tele-photography, by Mr. Thomas R. Dallmeyer, will be published. We have been given the opportunity of glancing at the advance proof-sheets of the work, and it appears to us that the author has developed the theory of the tele-photographic lens system in such a manner that the photographer with whom anything but the most elementary optics are not strong points, can easily grasp the fundamental principles of this method of image formation. Nor does Mr. Dallmeyer overlook the advanced worker in his book, which contains some matter in relation to its principal theme not hitherto published. The illustrations, which are both striking and attractive, are from negatives by Mr. Dallmeyer himself, and they show, with that marvellous realism of which one never seems to tire, the effect of substituting a tele-photographic lens for one of a normal length of focus.

MR. DALLMEYER'S long-distance tele-photography was accomplished on the south coast, the Isle of Wight, twenty-two miles across the water from Boscombe, offering a capital study for

the purpose. It is noteworthy that, although practical tele-photography may be said to have originated in this country, the fullest advantages of the enormous possibilities of the system have only been availed of abroad by Continental governments and men of science. Such a subject as a mountain from a distance of fifty-two miles (*vide* the Bolsonas picture of Mont Blanc) may be looked upon as a practical impossibility in Great Britain, owing to the fact that the atmosphere of these islands is rarely clear enough to allow of a sharp image at such a distance being obtained. Hence we are disposed to regard Mr. Dallmeyer's tele-photograph of the Isle of Wight, across twenty-two miles of water, as an achievement deserving of more than passing notice. To the best of our recollection, no home-produced photograph of an object situated at such a great distance from the camera has yet been shown. If we are in error here, we should be glad to have particulars.

\* \* \*

THE Select Committee of the House of Lords on the Copyright Bill met again on June 30. Lord Monkswell presided. Colonel Waterhouse, Hon. Secretary of the Royal Photographic Society, produced the resolution of the Society, protesting against any interference with the Copyright Act of 1862. Photography, he pointed out, was not a merely mechanical process, and there could be as much feeling in a photograph as in a painting. Lord Knutsford said he supposed they had a sentimental objection to being put on a different footing from painters. The witness said what they objected to was the placing of photography on a distinctly lower grade. Mr. Gambler Bolton took the same view, and gave instances in which his photographs had been drawn and published as original drawings. Lord Hatherton said there was a growing custom of photographing houses and grounds for publication in newspapers. Had the newspaper a copyright in that photograph? He had seen the word copyright added to the picture. Mr. Cutler, Q.C., said there could be no copyright in such a photograph. The Chairman: In many cases they put copyright where there was no copyright at all. The witness, in conclusion, said he thought that photographers had as much right to be considered artists as painters and sculptors. Mr. Elliott, of Messrs. Elliott & Fry, Mr. Mitchell, Manager of the London Stereoscopic Company, and Mr. Frith, of Reigate, also gave evidence, and the Committee adjourned.



FOR the convenience of those of our readers attending next week's Gloucester meeting of the Convention we print elsewhere in this issue of the JOURNAL the synopsis of the official proceedings. There is also in our Correspondence columns a letter from the Hon. Secretary (Mr. Bridge) relating to excursion trains from London. It will also be observed that Mr. Alfred Watkins is prepared to demonstrate during the week a "time" method of developing Spectrum plates. We hear, too, that there is a likelihood of the Secco and Wellington & Ward stripping films being demonstrated as occasion may arise. Those of our friends who may wish to communicate with us personally or by letter during the Convention should address us at the New Inn, Gloucester.

\* \* \*

OF those who attended last week's *Soirée* of the R.P.S., nobody was more pleased to mark the success with which it went off than ourselves, who first publicly mooted the idea of such a house-warming in these pages on May 5. Among the Society's treasures which were displayed on that occasion, and to which reference was not made in our report, were a series of Dr. Emerson's famous East Anglian landscape and figure studies, which have not been publicly shown except in book form for some years past. Many of the visitors at the *Soirée*, who have only taken up photography comparatively recently, were not familiar with Dr. Emerson's work, and, as they turned over these pictures, anxious questions as to who they were by, remarks as to how like Clausen in style, and so on, from delighted critics, caught the ear.

\* \* \*

It is to be hoped that these very fine works which, besides being splendid examples of pure photography, show a boldness and mastery of pictorial effect in figure and landscape work probably unapproached by the productions of any living photographer, will in due course be rescued from the oblivion of the portfolio, suitably framed, and hung in the Royal Photographic Society's rooms. To our thinking they transcend in interest much of the more modern work that has been acquired for the permanent collection, and they have the additional value of emphatically marking what we may be allowed to term the renaissance of pictorial photography fourteen years ago.

\* \* \*

MESSRS. BERGER & Co. of Southill Park, London N.W. announce a new method of imparting "natural colours" to photographs. These results are said to be obtained by a new printing-out paper. It is stated that the prints are finished in exactly the same way as those upon ordinary P.O.P., and the tints may then be instantly developed upon any desired part of the picture with the utmost ease, rapidity, and certainty. It is also stated that no dyes, colours, pigments, or special apparatus, are required.

\* \* \*

MR. George W. Tottem, F.R.P.S., of 6, The Boulevard, High-road, Balham, S.W., in sending us for inspection a beautiful portrait of a pretty little child, draws attention to the print as a specimen of mounting, it being attached to the mount in a way possibly unknown to many. He adds: "We all know amateurs as a rule get tied into knots when they start putting a 'Mountant' on their prints, and they fall back on to those al-p-shod things, 'Slip Mounts.' Now, being a dealer, I ought

to say nothing about them; but, as I *do object* very strongly, I don't mind saying so. Consequently I demonstrate my method of mounting several times a day throughout the week. This is the scheme: I take a large glass (cutting shape, say), spread mountant, lay print down, rub well into contact, peel off, lay on mount and rub well down, which is as simple and quick in practice as it is to write. The advantages are that one's fingers do not get messed up, only enough mountant is left on print to make it adhere to card, no dirty edges, no finger marks on face, and, in the case of glazed prints, no backing. I can mount a 23 x 17 enlargement just as readily as a pocket Kodak print in this way; and so do those to whom I have shown the method." Many an amateur photographer may be glad of Mr. Tottem's very useful hint on mounting. From practical experience of it we can recommend it.

\* \* \*

MR. J. CRAIG ANNAN informs us that the work of organizing the Great International Exhibition at Glasgow in the year 1901 is already well in hand. Mr. Annan himself is the convener of the committee which has charge of the Photographic Section. The Exhibition buildings will be located at Kelvingrove Park, where the group of the Photographic Convention was taken in July last year. It is expected that the display of photographs will be the largest yet brought together. The last great International Exhibition was held in Glasgow eleven years ago, and it will be remembered as a conspicuous success. Glasgow hopes in 1901 to break its own record.

\* \* \*

MR. S. H. FRY, of 12, South Villas, Camden-square, N.W., has been good enough to send us an enlarged print in platinum from one of the groups taken by Mr. A. L. Henderson on the occasion of that gentleman entertaining the members of the London and Provincial Photographic Association at his house, Brimsdown, Middlesex, a few weeks ago. The print is a very fine one on Platona paper, and this, combined with the fact that there are many excellent portraits of our fellow-members of the London and Provincial in the group, makes Mr. Fry's picture of the greatest interest to us as a pleasant memento of a pleasant outing.

\* \* \*

AFTER several years' service, Mr. T. E. Freshwater, F.R.M.S., yielding to the paramount claims of business, has found himself obliged to resign the Hon. Secretaryship of the London and Provincial Photographic Association. He leaves the London and Provincial in a vigorous position and with a good balance at the bank. In a quiet and unostentatious way Mr. Freshwater got through a great deal of good work during his tenure of office, and we are pleased to learn that the members intend asking him to accept some tangible token of their appreciation of his services. The growth of the claims on our time render it impossible for us to be so frequently present at the London and Provincial meetings as in past years, but we gladly testify, from the capital reports and papers that so often appear in our columns, to the excellent and informative nature of the discussions that still, as in days of yore, take place at the London and Provincial. In the maintenance of that Association at the high intellectual level it has invariably touched during its history Mr. Freshwater has borne a useful and prominent part, and we desire to join its other members in thanking him for his work as its Hon. Secretary and Treasurer.



MR. HARRY WADE, of 29, Blackfriars-street, Manchester, asks us to state that on Messrs. Wellington & Ward's behalf he is prepared to deliver before photographic societies a demonstration on their new film, which is shortly to be put on the market. Secretaries are requested to make early application to him for dates. Mr. Wade is a skilful photographer, and may be relied on to do the new film every justice.

\* \* A METHOD of making enlarged negatives from an enlarged transparency of the original negative forms the subject of our leading article this week.—Those interested in Professor Wood's method of colour photography with diffraction gratings will find a further contribution on the subject which indicates several possibilities of this interesting process.—The action of coloured substances on dry plates, which Mr. Vincent treats of, takes up the line of work which has recently occupied so much of Dr. W. J. Russell's attention, and shows that ozone has a large influence in producing "photographic pictures in the dark."—Mr. Bothamley's remarks on the Ilford Platona paper, of which we continue to hear very favourable accounts, will be useful to those experimenting with the new paper.—Mr. Debenham's paper, on "The Illumination of the Dark Room," contains many points of practical interest for dark-room workers. The reference to the effect of working with different coloured lights on the eyesight and nerves deserves particular attention.—In the article entitled "Actinograms and a Self-recording Actinometer," our contributor, Mr. John A. Randall, describes what appears to be a very ingenious instrument for taking continuous records of the actinic value of light.

#### A NEGLECTED SYSTEM OF ENLARGING.

IN the issue of last week there is a paper, read before the Photographic Society of Philadelphia, on reproducing and enlarging negatives. This paper, like many others that have been read in this country, deals more particularly with the methods of making the transparency and general formulæ. In the majority of the papers which are read on this subject transparencies by contact, either on dry plates or by the carbon process, have been advocated, while another, and in many cases a much better, system has been quite overlooked, though its utility has more than once been referred to in these pages. The method was some years ago vended as a secret process by a then well-known photographer, who realised a tolerably good sum by the business. In a word, the system is this:—

Instead of making the transparency by contact printing, it is made direct as the enlargement, and from that the negative is made by contact printing. Let us now consider the advantages of that method of procedure. It will be obvious that, as the actual amplification is made direct from the original negative, the utmost sharpness is secured, and only what exists in that is shown. When a transparency is made by contact printing on a dry plate, unless the glass, as well as that of the original negative, is perfectly flat, absolute contact in all parts is not secured, and consequently there is a loss of sharpness to begin with. It is manifest that any defect, mechanical or otherwise—minute spots or specks in the film, for example—granularity of the image, or other imperfections, will be magnified in the enlarged negative, yet they do not exist in the original. If, however, the plate upon which the enlarged transparency is

made contains similar defects, they, not being magnified, will not be noticeable.

One of the great advantages of this system of making enlargements is the great scope it gives for improvements by retouching, which could not be done on a contact transparency by reason of the fact that, whatever work was put upon it, it would be magnified in the enlargement, and so become very conspicuous in the finished result, however skilfully and finely the work may be done. Here is a further example of the advantage of the enlarged-transparency method: Given a weak or feeble original, in the transferring the shadows and darker half-tones can easily be strengthened by washes of water colour, or by stippling with black lead, and much of this work can be roughly done on the back of the plate if that be given a coating of matt varnish. The retouching of a transparency is easier to a novice than the retouching of a negative, by reason of the lights and shades being the same as they are in the finished print, and its being of the same size, in fact a counterpart of it. In this way a vigorous transparency, so far as the shadows and darker half-tints are concerned, may be made from a feeble original, leaving the light and lighter half-tints to be strengthened in the negative; and, as with the transparency, much of the bolder work can be quickly done on the back of the plate.

The negative from the enlarged transparency may be made on a dry plate by contact printing, or, if it is required reversed as for single transfer carbon printing or other purposes, it may be made by the carbon process in the same way that carbon transparencies are made.

With this system it is better that no attempt be made at retouching on the original negative; that is best left for execution on the enlarged transparency and the negative from it, because it can be more easily and quickly done, while the result will be better in the end. It is, as most know, very troublesome to ameliorate the amplified retouching on small negatives in an enlarged one so that it is not conspicuous. By this system of enlarging, as we have just intimated, it is a very simple matter to make vigorous enlarged negatives from weak and feeble ones, and, conversely, to obtain harmonious ones from harsh originals, by supplementing what can be done in skilled hands by exaggerating or subduing the contrast in the developing of the image, by hard work quickly and easily applied. As a practical illustration of the value of this method of producing enlargements, it may be mentioned that many, if not all, the very fine enlarged pictures of the lions in the "Zoo," published some years ago by Messrs. Dixon & Son, were produced in this way.

In the paper that suggested this article reference is made to the reproduction of negatives the same size as the originals. We happen to know that, some years ago, it was the custom with more than one portraitist, when a number of negatives of a subject had to be reproduced for publication portraits, for them to make an enlarged transparency—12×10 or 15×12—retouch that, and then from it reduce to the size desired. By this means better results were obtained than by making the negatives from transparencies made by contact printing, as they were less like reproductions.

The only objection that can be raised against this system of producing enlarged negatives is that it involves the cost of two large plates; but surely that is not a serious item for consideration in sizes up to 15×12 or 18×15, and amateurs seldom exceed those sizes in their enlargements when the scope for improving in ultimate results is taken into account.



**Orthochromatic Photography.**—M. H. Bellieni writes an interesting letter to the *Moniteur de la Photographie* concerning the value of orthochromatic photography in deciphering documents. M. Arnould, the owner of some land at Bonzey, was a bachelor. A tenant, with a large family, with whom he was on friendly terms, was looked upon as likely to succeed to the estate. The property was flooded, M. Arnould drowned, and his papers lost. The next-of-kin claimed the estate, and the tenant tried in vain to prove his right to the property. By accident a bundle of papers was found in the mud not far from the house. The documents were stained, torn, and saturated with dirt. They were handed over to the local photographers, who were unable to reproduce a trace of the writing. The matter was brought under M. Bellieni's notice, and he, with the aid of orthochromatic plates and a screen, succeeded in obtaining a legible photograph of the documents. The case was again taken into Court, and the tenant, by aid of the photographic evidence, was enabled to establish his right to the land. M. Bellieni has sent M. Léon Vidal copies of the two photographs on ordinary and orthochromatic plates. Another romance of real life is thus added to the list in which orthochromatic photography plays an important part.

**Flashlight Powder.**—Herr Gaedicke refers to an article, which appeared in the *American Journal of Photography*, upon Flash Powders, and was republished in THE BRITISH JOURNAL OF PHOTOGRAPHY, May 19, 1899, p. 313. It was stated that the compound patented by Gaedicke and Mische contained amorphous phosphorus, but was never sold commercially. Herr Gaedicke says both these statements are incorrect. Amorphous phosphorus was never recommended by them, but they did recommend sulphide of antimony to accelerate combustion. Their flash powder was sold in large quantities, but not with the addition of chlorate of potash, which was included in the original formula. Nitrate of potash was substituted, and, to avoid any possible risk in transmission through the post, the magnesium was packed separately.

**Light and Colour.**—The *Deutsche Photographen Zeitung* gives the following interesting table of the amount of light reflected by substances and colours, taking one as the unit of incident light:—

Black velvet .....	0.004	White sandstone .....	0.237
„ cloth .....	0.012	Bright blue .....	0.300
„ paper .....	0.045	„ yellow .....	0.400
Dark blue .....	0.065	„ green .....	0.465
Dark moist earth .....	0.079	„ orange .....	0.548
Dark green .....	0.101	Plain white paper (photo-	
Bright red .....	0.162	graphic) .....	0.700
The moon .....	0.170	Fresh snow .....	0.783
Deep yellow .....	0.200	Mirrors .....	0.823

These figures are based upon the physiological intensity of the reflected light from the objects when illuminated with white light, taking spectral D as the optical maximum of intensity; but, as the maximum of sensitiveness of an ordinary bromide plate is about  $F_{\frac{1}{2}}G$ , the colour of the object should be considered in relation to the plate, and not visually. To obtain the same density of deposit upon an ordinary gelatine plate as one would get for a given exposure upon light blue or white, the following exposure factors should be observed:—

Violet .....	about	4 times longer.
Green .....	2	„ „
Yellowish-green .....	20	„ „
Yellow .....	36	„ „
Orange .....	120	„ „
Red .....	1600	„ „

**The "Art Portfolio."**—We constantly hear complaints in this country of the keen competition of cheap German workmanship. It is therefore refreshing to read in the *Wiener Freie Photographen Zeitung* that this publication is causing some anxiety in Germany.

Dr. Eder exhibited a specimen of the *Art Portfolio* at a meeting of the Vienna Photographic Association, and drew attention to the method by which these photogravures were produced with a very fine screen. He predicted that the process would greatly influence the future of photo-mechanical work, as it could compete with collotype, &c. Herr Schrank was of opinion that the process was originally due to Klic, who invented it in England, and suggested that inquiries might be made, as Klic was now residing in Vienna.

## THE DIFFRACTION PROCESS OF COLOUR PHOTOGRAPHY.

(Nature.)

THE production of colour by photography has been accomplished in two radically different ways up to the present time. In one, the so-called Lippmann process, the waves of light form directly in the photographic film laminae of varying thickness, depending on the wave-length or colour of the light. These thin laminae show interference colours in reflected light in the same way that the soap bubble does, and these colours approximate closely to the tints of the original.

The technical difficulties involved in this process are so great that really very few satisfactory pictures have ever been made by it. The other, or three-colour process, has been developed along several distinct lines, the most satisfactory results having been produced by Ives with his stereoscopic kromskop, in which the reproduction is so perfect that, in the case of still-life subjects, it would be almost impossible to distinguish between the picture and the original seen through a slightly concave lens. The theory of the three-colour method is so well known that it will be unnecessary to devote any space to it, except to remind the reader of the two chief ways in which the synthesis of the finished picture is effected from the three negatives. We have first the triple lantern and the kromskop in which the synthesis is optical, there being a direct addition of light to light in the compound colours, yellow being produced, for example, by the addition of red and green. The second method is illustrated by the modern trichromatic printing in pigments. Here we do not have an addition of light to light, and consequently cannot produce yellow from red and green, having to produce the green by a mixture of yellow and blue. Still a third method, that of Joly, accomplishes an optical synthesis on the retina of the eye, the picture being a linear mosaic in red, green, and blue, the individual lines being too fine to be distinguished as such.

The diffraction process, which I have briefly described in the April number of the *Philosophical Magazine*, is really a variation of the three-colour process, though it possesses some advantages which the other methods do not have, such as the complete elimination of coloured screens and pigments from the finished picture, and the possibility of printing one picture from another. The idea of using a diffraction grating occurred to me while endeavouring to think of some way of impressing a surface with a structure capable of sending light of a certain colour to the eye, and then superposing on this a second structure capable of sending light of another colour, without in any way interfering with the light furnished by the first structure. This cannot, of course, be done with inks, since, if we print green ink over red, the result will not be a mixture of red light and green light, but almost perfect absence of any light whatever; in other words, instead of getting yellow we get black. Let us consider first how a picture in colour might be produced by diffraction. Place a diffraction grating (which is merely a glass plate with fine lines ruled on its surface) before a lens, and allow the light of a lamp to fall upon it. There will be formed on a sheet of paper placed in the focal plane of the lens an image of the lamp flame, and spectra, or rainbow-coloured bands, on each side of it. Now make a small hole in the sheet of paper in the red part of one of these spectra. This hole is receiving red light from the whole surface of the grating; consequently, if we get behind the paper and look through the hole, we shall see the grating illuminated in pure red light over its whole extent. This is indicated in fig. 1, where we have the red end of the spectrum falling on the hole, the paths of the red rays from the



grating to the eye being indicated by dotted lines. Now, the position of the spectra with reference to the central image of the flame depends on the number of lines to the inch with which the grating is ruled. The finer the ruling the further removed from the central image are the coloured bands. Suppose now we remove the grating

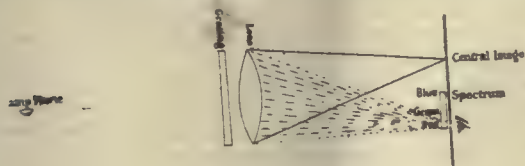


FIG. 1.

in fig. 1, and substitute for it one with closer ruling. The spectrum will be a little lower down in the diagram, and, instead of the red falling on the hole, there will be green; consequently, if we now look through the hole, we shall see this grating illuminated in green light. A still finer ruling will give us a grating which will appear blue. Now, suppose that the two first gratings be put in front of the lens together, overlapping as shown in fig. 2. This combination

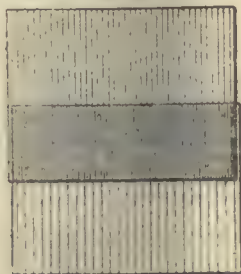


FIG. 2.

will form two overlapping spectra, the red of the one falling in the same place as the green of the other, namely on the eyehole. The upper strip, where we have the close ruling, sends green light to the eye and appears green; the under strip, with the coarser ruling, sends red light to the eye and appears red, while the middle portion, where we have both rulings, sends both red and green light to the eye, and in consequence appears yellow, since the simultaneous action of red and green light on any portion of the retina causes the sensation of yellow. In other words, we have, in superposed diffraction gratings, a structure capable of sending several colours at once to the eye.

If we add the third grating, we shall see the portion where all three overlap illuminated in white, produced by the mixture of red, green, and blue light.

Three gratings with 2000 lines, 2400 lines, and 2750 lines to the

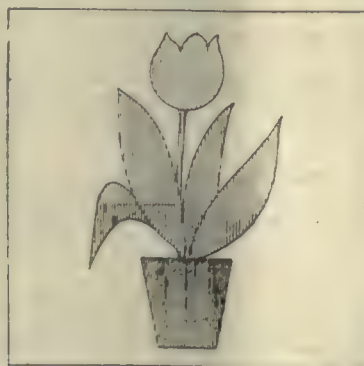


FIG. 3.

inch, will send red, green, and blue light in the same direction, or, in other words, to the same spot on the screen behind the lens.

Suppose, now, we have a glass plate with a design of a tulip, with

its blossom ruled with 2000 lines to the inch, its leaves ruled with 2400, and the pot in which it is growing ruled with 2750 lines, and place this plate before the lens. On looking through the hole, we shall see a red tulip with green leaves growing in a blue pot. Thus we see how it is possible to produce a coloured picture by means of diffraction lines, which are in themselves colourless. Those portions of the plate where there are no lines send no light to the eye, and appear black.

We have now to consider how this principle can be applied to photography. That photographs which show colour on this principle can be made depends on the fact that a diffraction grating can be copied by contact printing in sunlight on glass coated with a thin film of bichromated gelatine. The general method which I have found best is as follows: Three gratings ruled on glass with the requisite spacing were first prepared.\*

To produce a picture in colour, three negatives were taken through red, green, and blue colour filters in the usual manner. From these three ordinary lantern-slide positives were made. A sheet of thin plate glass was coated with chrome gelatine, dried, and cut up into pieces of suitable size; one of these was placed with the sensitive film in contact with the ruled surface of the 2000-line grating, and the whole covered with the positive representing the action of the red light in the picture. An exposure of thirty seconds to sunlight impressed the lines of the grating on the film in those places which lay under the transparent parts of the positive. The second grating and the positive representing the green were now substituted for the others, and a second exposure was made. The yellows in the picture being transparent in both positives, both sets of lines were printed superposed in these parts of the picture, while the green parts received the impression of 2400 lines to the inch only.

The same was done for the blue, and the plate then washed for a few seconds in warm water. On drying, it appeared as a coloured photograph when placed in front of the lens and viewed through the hole in the screen. Proper registration during the triple printing is secured by making reference marks on the plates. A picture of this sort once produced can be reproduced indefinitely by making contact prints, since the arrangement of the lines will be the same in all of the copies as in the original. The finished picture is perfectly transparent, and is merely a diffraction grating on gelatine with variable spacing. In some parts of the picture there will be a double grating, and in other parts (the whites) there will be a triple set of lines. Having had some difficulty in getting three sets of lines on a single film in such a way as to produce a good white, I have adopted the method of making the red and green gratings on one plate and the blue on another, and then mounting the two with the films in contact. It is very little trouble to multiply the pictures once the original red-green grating picture is made.

The pictures are viewed with a very simple piece of apparatus, shown in fig. 4, consisting of a lens cut square like a reading glass,

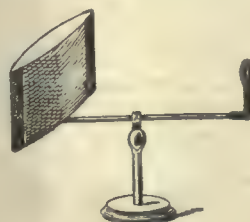


FIG. 4.

mounted on a light frame provided with a black screen perforated with an eyehole, through which the pictures are viewed. The colours are extremely brilliant, and there is a peculiar fascination in the pictures, since, if the viewing apparatus be slowly turned so that its direction with reference to the light varies, the colours change in a most delightful manner, giving us, for example, green roses with red leaves, or blue roses with purple leaves, a feature which should appeal to the impressionists. The reason of this kaleidoscopic effect

\* These gratings were ruled for us on the dividing engine at Cornell University through the courtesy of Professor E. L. Nichols.



is evident, for, by turning the viewing apparatus, we bring the eye into different parts of the overlapping spectra.

It is possible to project the pictures by employing a very intense light and placing a projecting lens in place of the eye behind the perforation in the screen. Of course, a very large percentage of the light is lost, consequently great amplification cannot well be obtained. I have found that sunlight gives the best results, and have thrown up a three-inch picture on a four-foot sheet, so that it could be seen by a fair-sized audience.

By employing a lens of suitable focus it is possible to make the viewing apparatus binocular, for similar sets of superposed spectra are formed on each side of the central image by the gratings, so that we may have two eyeholes if the distance between the spectra corresponds to the interocular distance.

It is interesting to consider that it is theoretically possible to produce one of these diffraction pictures directly in the camera on a single plate. If a photographic plate of fine grain were to be exposed in succession in the camera under red, green, and blue screens, on the surfaces of which diffraction gratings had been ruled or photographed, the plate on development should appear as a coloured positive when seen in the viewing apparatus. I have done this for a single colour, but the commercial plates are too coarse-grained to take the impression of more than a single set of lines. With specially made plates I hope to obtain better results.

PROFESSOR R. W. WOOD.

#### "SECCO," A NEW STRIPPING FILM.

Writing on the subject of film photography a few weeks ago,\* we remarked that "the field available for film photography is an enormously wide one, and, in our opinion, . . . good substitutes for rollable celluloid will always find ready acceptance at the hands of the public. . . . The conveniences of film photography to vast numbers of photographers are so great that commercial enterprise in supplying the demand can scarcely meet with an unfavourable response for years to come." Secco film, which is just about to be placed on the market, appears therefore at a most favourable moment.

Those of our readers who are interested in the details of manufacture of the new stripper are referred to our pages of March 3 last, where the process is minutely described by the inventors in their Patent specification. Our present object, however, does not concern itself with the system adopted in the preparation of the paper, but to inform our readers of the results of our observations at a demonstration of the new stripping film, which was given on Friday in last week at the studios of Messrs. J. H. Avery & Co., 164, Strand, W.C.

Secco is apparently a gelatine emulsion, coated on a thin paper support. The stripped negatives possess perfect flexibility; they do not stretch in the manipulations of development or subsequently, and a very simple test with a lighted match shows that the vehicle has no collodion in it. We examined with great interest a very large collection of stripped negatives that had been prepared for inspection. Nothing finer in the way of sharp, crisp, non-granular images could be desired. Moreover, it was shown that the Secco film obviates halation in a very marked degree. We do not hesitate to say that Secco film, judging by the results we saw, is qualitatively all that can be expected of it.

But what of the stripping process, and how is it likely to behave in the hands of photographers, amateur or professional? The process is simplicity itself. The developed, fixed, and washed-paper negative is squeezed film side down on to what may be conveniently termed a temporary paper support, also coated with gelatine. Thus your image is now backed up on each surface with a film of gelatine and paper. When the negative is dried, or before if necessary, the corners of the paper supports are gently turned back, and with the slightest possible pressure and all the ease in the world, the paper sheets strip off the gelatine, and there is your negative complete, to be handled in precisely the same way as one on celluloid. We ourselves repeated the stripping process several times with perfect success; indeed, in all our experience, we never found a stripping paper work so easily and with such certainty.

Secco film has only to do in the hands of photographers what it did in ours on Friday afternoon last to be assured of a great popular vogue. We repeat that the demand for such a film is practically inexhaustible. The paper is at present sent out in cut sheets, but its adaptation to

rollable purposes will follow as a matter of course. It is not necessary for us to inform the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY what the advantages of a gelatine stripping film of the nature of that above described are in practice. We should say that ordinary pyro-ammonia development was adopted in the demonstration we witnessed, and a final bath of glycerine was employed. Nothing could be simpler, or, apparently, more certain than the working of Secco films, which, finally, do not curl in the solutions, and all through the manipulations behaved in a manner which was above reproach.

In reference to the foregoing, Messrs. Whitney, Graaff, & Co., of 39, Lombard-street, E.C., write: "Referring to our correspondence re 'Secco' films, we have pleasure in informing you that we have decided to demonstrate the advantages of same before any photographic societies that may be interested, and have arranged with Messrs. J. H. Avery & Co., of 164, Strand, to give demonstrations when and where required."

"We should be glad if secretaries of societies, wishing to have a demonstration, would communicate direct with Mr. Avery, when the necessary arrangements would be made."

#### ON SOME PHOTOGRAPHIC PHENOMENA CONNECTED WITH THE COLSON-RUSSELL EFFECT.

[Re-printed from the *Chemical News*.]

##### INTRODUCTION.

COLSON, who has for several years been publishing papers on the effects of various agents on a photographic plate, first found that heat in presence of moisture from paper, &c., was able to so affect a photographic plate as to cause a darkening of the sensitive surface when the plate was treated with a developer (*Comptes Rendus*, Jan. 1896, cxiii. 598-600). Colson subsequently found that the air in the neighbourhood of some bright metals possessed a similar property (*Comptes Rendus*, Jan. 1896, cxiii. 49-51). This he attributed to the action of the vapours of the metals themselves.

Russell discovered both these effects quite independently a little later, and in a series of papers (*Chemical News*, lxxv. 302; 1898, lxxvii. 167, *Proc. Roy. Soc.*, xiii. 102; lxiv. 409) has shown that both classes of effect are probably due to the same active agent. This agent is, in his opinion, hydrogen peroxide, and he has obtained chemical tests for the presence of this body in all cases in which the plate has been darkened by the emanations under discussion. The chemical recognition of hydrogen peroxide is a matter of great difficulty and uncertainty, and the probability of the truth of Russell's theory rests more securely on the perfect analogy which he has shown to exist between the behaviour of the vapours from active bodies and that of hydrogen peroxide. The completeness with which this similarity in properties is exhibited is remarkable, and can hardly be capable of any other interpretation than that of the identity of the active agents.

It must be borne in mind, however, that another explanation of the photographic activity of metals like zinc has been put forward by von Lengyel (*Wied. Ann.*, 1898, lxxi. [5], pp. 1162-1170), who looks upon hydrogen as the active agent. According to this author, hydrogen has an effect on a photographic plate similar to that of light, producing a modification of silver bromide, which is reduced by an ordinary developer. Russell, however, states in his first paper that, in an atmosphere of hydrogen, the action takes place as in ordinary air. This means that the effect of the hydrogen itself was so slight as not to be noticed by Russell, in comparison with the effect of the active bodies he was investigating.

The work of Russell shows that the dry plate furnishes a means to distinguish between hydrogen peroxide and ozone, as the latter does not affect the film. But, in making use of this test, the action of ozone upon any substance in the neighbourhood of the plate must be considered. It is the object of this paper to show that some bodies, which, although perfectly inactive previously, become strongly active when treated with even small quantities of ozone.

##### EXPERIMENTS WITH INDIARUBBER.

Indiarubber, as Russell has proved, is an inactive substance; that is to say, it may be put in contact with a photographic dry plate for a week or so without exerting any effect on the plate capable of causing darkening on development; but, if ozonised air be allowed to come into contact with the rubber for only a short time, it becomes so active as to give a picture in a few minutes. The effect may be heightened by passing the ozonised air over the indiarubber in a gentle stream. In this way, five minutes' ozonising and five minutes' exposure of the plate are quite sufficient to give a dark picture when Ilford special rapid plates are used.

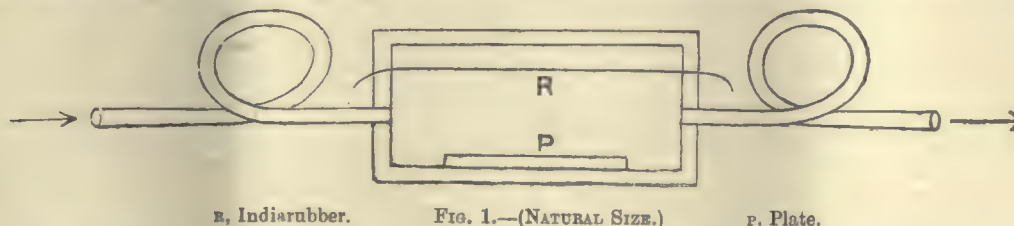
The mode of experimenting may be varied as follows: A box of lead was taken and a sheet of rubber stretched over the top; this rubber was held in position conveniently by the lid of the box, also of lead. Two tubes of the same metal are provided for the entrance and exit of air and these tubes have their openings beneath the rubber diaphragms. The tubes are bent so as to render the box light-tight (fig. 1). If, now, a plate

\* THE BRITISH JOURNAL OF PHOTOGRAPHY, May 19, 1899, p. 305.



be put into the box with its sensitive film facing the surface of the rubber, and a coin or piece of glass or quartz be placed upon it, no picture is obtained by passing ordinary air through the apparatus; neither is any picture obtained if ozonised air be used and the rubber be absent. If, however, ozonised air and rubber be used, a picture is easily obtained in a few minutes. The effect is not one of light, since the quartz and glass appear equally opaque to the effect as the metals.

The rubber, on testing, is found to be photographically active either before or after removal from the box. The activity persists for some days afterwards, even when the time during which ozonised air has had access to it has only been a few minutes. The action of ozone on rubber is well known as regards its physical effects. If rubber tubing be used to convey ozonised air, it rapidly becomes so changed that, on slightly stretching it, it breaks up in transverse rings. The action is well shown on photographs of rubber sheeting obtained by contact in the dark. If the ozonisation has been continued so long as to have caused the rubber to break, the broken edges are beautifully distinct on the photograph.



This indicates that the activity of the rubber arises from some product of the action of ozone on the rubber itself, as distinct from any action that may occur between the ozone and the water or other bodies present.

The effect of ozonised rubber is probably due to the formation of hydrogen peroxide. Indiarubber yields on distillation, at moderate temperatures, bodies such as isoprene, more or less allied to the terpenes. Thus it seems possible that rubber itself consists largely of bodies chemically related to the terpenes. The latter are well known to yield hydrogen peroxide on oxidation, and Russell has shown that all the terpenes are photographically active.

Mr. Bryan was good enough to test some rubber sheets in his apparatus for investigating the effect of bodies on the contact difference of potential between two metals. He found that rubber itself had no influence, while ozonised rubber and rubber exposed to the vapour of hydrogen peroxide had an effect in the same sense. This result is not properly to be interpreted by remarking that ozone and hydrogen peroxide both affect the rubber similarly, since hydrogen peroxide apparently has no chemical action on rubber. It rather shows that hydrogen peroxide is a product of ozonisation of rubber.

#### TRANSFER PICTURES.

If a plate, after being subjected to the influence of the ozonised rubber, be placed upon another plate before development, then, after the films have been in contact some time, the picture may be developed on both the plates. Thus these pictures can not only be taken, but also in a sense printed, in the dark. Professor J. J. Thomson informs me that Russell has also obtained such pictures; a similar phenomenon is mentioned in Russell's papers, in which the first photographic film is replaced by a non-active body capable of transmitting the effect. This capacity of printing transfers is of use in satisfying the experimenter that any particular effect is not due to radiation of any type. Such transfer pictures have been said to be capable of production by light. But the universal practice of photographers is to store exposed plates film to film before development. No such phenomenon ever occurs as the one exposed plate affecting the other. Another reason for thinking that any such effect is absent is found in the total lack of any accumulative continuing action of light on a photographic dry plate. Experiments to obtain transfers with dry plates and daylight were carried out, both with normal exposures and also with exposures producing solarisation, but not the slightest effect could be obtained. These remarks do not apply to the bichromate processes in which continuing action does occur (Vogel, "The Chemistry of Light and Photography," 1875, p. 242), as is well known, and transfer pictures by contact in the dark can be obtained (THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1899, p. 822).

The active agent from ozonised rubber passes through paper, gelatine, tracing paper, &c., in the same way as with Russell photographs; and bodies like the metals, glass, and quartz are opaque to it.

#### SENSITIVENESS OF THIS TEST FOR OZONE.

The amount of ozone necessary to obtain these pictures seems to be very small; for, if the positive or negative brush discharge from a small Wimshurst machine be allowed to play on a disc of metal, with a central aperture leading through one of the lead tubes to the box in the apparatus above described, the pictures can be obtained in an hour, even without drawing the ozonised air over the rubber. The ozone necessary reaches the rubber by diffusion only.

#### TESTS FOR $H_2O_2$ .

A glass tube, two feet long and an inch wide, was loosely packed with shreds of pure rubber. Ozonised oxygen, after passing through the tube, was photographically active. The rubber was then washed with water, and the latter gave the tests for  $H_2O_2$  with chromic acid and titanic acid. This water was also exceedingly active photographically; a plate placed a quarter of an inch from its surface gave a good picture in ten minutes, while painting the liquid on to the plate produced solarisation almost immediately.

#### EXPERIMENTS WITH OTHER BODIES.

The common varieties of gutta percha also become fairly active on ozonising; but pure gutta percha becomes only slightly active, so as to require ozonised air to be in contact with the sheet for a quarter of an hour, and a subsequent exposure of the plate for half an hour, in order to obtain a picture capable of development.

It is interesting to note that camphor also becomes active by treatment

with ozone. In experimenting with bodies other than rubber it is best to use oxygen instead of air, as this is an economy of time. On ozonising camphor for ten minutes, it becomes active enough to give a good picture with a quarter of an hour exposure. As Russell has previously shown, camphor, indiarubber, and gutta percha are ordinarily quite inactive, though capable of transmitting the active agent.

Those other bodies (including cork, vulcanite, and gelatine) which have been tested with ozone are either inactive or else the effect is much less than in the above cases.

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#### PHOTOGRAPHY IN THE ARGENTINE.

At the Royal Photographic Society's *Soirée*, the other night, were a very fine collection of portraits by Mr. A. S. Witcomb, of Buenos Ayres, kindly lent by Don Dominguez, the Argentine Chargé d'Affaires. Unfortunately, through their late arrival and their being unframed, only a few could be shown. The pictures were sent here at the request of the Committee appointed by the President of the Republic, not for sale, but to embellish the Argentine stall at the recent bazaar at the Albert Hall. Previous to the pictures—about sixty, single figures and groups from 20 x 16 downwards—being received at Russell-square, we had the opportunity of examining them, and we may say that we have rarely had the pleasure of seeing so fine a collection. The prints were all on matt-surface, collodio-chloride paper of, we are told, Mr. Witcomb's own preparation, and they were of a rich black tone, unlike ordinary collodio-chloride prints. The Argentine is a long way off, but photography has put us in possession of the fact that there are very beautiful ladies in Buenos Ayres, and that they dress with exquisite taste; also that in Mr. Witcomb the Argentine possesses an artist who is not excelled by any on this side. When examining this fine work, one could not help feeling a certain degree of pride that Mr. Witcomb is one of our fellow-countrymen.

#### THE ILLUMINATION OF THE DARK ROOM.

(Paper read before the North Middlesex Photographic Society.)

THE question as to what is the light most suitable for illuminating the dark room in which the photographer manipulates his sensitive plates is one which concerns not only the excellence of his results, in their freedom from fogging due to excess of light, and from faults due to the difficulty of working in insufficient light, but there is, as well, the effect of continued strain upon the eyesight and nerves when working in such a light as is commonly used by photographers. It is because I think there is still considerable misapprehension on the subject that I propose now to discuss it.

In one of the few recent articles in which this matter has been referred to it is mentioned that there seems to be a general consensus of opinion in favour of a ruby light rather than one of a yellower colour, and it is suggested that the exacting character of modern plates is responsible for the preference. My own view is that, ruby light having been originally insisted upon in instructions for working gelatino-bromide plates, these instructions have since been followed, and the necessity of ruby-coloured light has been accepted as a fact, owing to



the circumstance that photographers are not in the habit of making those careful comparative experiments, without which mere opinion ought to have no authority.

How it arose that red illumination was selected for bromide plates was due to two circumstances. In the first place, certain laboratory experiments had indicated a greater relative sensitiveness to green and yellow with bromide than with iodide of silver. When, however, gelatino-bromide of silver plates were compared with the ordinary wet-collodion in the camera, by photographing ribbons of various colours, as was done by the late J. R. Sawyer and afterwards by myself, it was not found that the yellow relatively to the red was more photographically active with the gelatine than with the collodion plate. The other circumstance, taken as indicating the necessity for ruby light for the dark room, was that photographs of the spectrum were produced, in which, with a strong action in the violet and blue, there was a slight action in the green and yellow, ceasing entirely in the red. A spectrum photograph of this kind was recently shown at the Royal Photographic Society in illustration of a lecture on orthochromatic photography, but a question elicited the explanation that the photograph was only to be taken as illustrating a particular length of exposure, and that a longer exposure would have caused the red to impress its image on the plate along with the rest of the spectrum.

The inference which naturally followed from consideration of these spectrum photographs was that, if the photographic action ceases in the red, as for the most part they represented it to do, or if the red is the least photographically active portion of the spectrum, as is the fact, light of that colour is the most suitable for working with when manipulating photographic plates. This inference must be, however, considerably qualified when it is remembered that the red is also much less luminous to ordinary eyes than is the yellow and the region near it on either side. The question then becomes the somewhat more complex one, What is the light which, when used in sparing quantity, will give the most visual illumination compared with its photographic activity? I have said when used in sparing quantity, because a further complication arises from the fact that, when lights of different colours are judged to be of equal luminosity when strong, this equality disappears when the strength of the lights is equally reduced. Captain Abney some years ago showed an apparatus in demonstration of this fact. Red and green squares of bright illumination were adjusted so that their luminosity appeared to be equal, but, upon reducing the illumination, the green remained visible after the red had apparently disappeared, and this to an extent indicating several times as great sensitiveness of the eyes to the green rays as compared to the red when both were feeble, as they had when both were strong.

The next point is the effect on the eyesight and nerves of continued working in light of particular colours. Here, of course, there will be great differences in different individuals, but I believe it is quite general to feel considerable strain after working for a time in red light. Mr., now Sir Henry, Harben, an enthusiastic amateur photographer, whose dark-room windows I changed from ruby to yellow by the aid of pale yellow-green glass and several thicknesses of yellow paper, told me that after an hour or so of the red illumination the eyes were so fatigued that he could not, after leaving the dark room, either read or do anything requiring the use of the eyes. After the change in the dark-room lighting, however, he was able to go direct to any other occupation without feeling any ill effect. One of the leaders of photographic thought tells me that with him the effect of red illumination is to induce nervous strain. On the other hand, the most unanswerable argument in favour of red light was brought forward by Mr. Andrew Pringle, who said that red light was agreeable to him, and greenish light the reverse. I think, however, his is a very rare case, but those who happen to have a similar peculiarity may, of course, do well to use a red light.

The case of orthochromatic plates may require some special consideration. The so-called orthochromatic and isochromatic plates which are sensitised for green and yellow, and not at all for red, may be best developed in a red light, although I have developed them in my yellow dark room without perceptible injury. For plates, however, which are really orthochromatic, red would be a very unsuitable illuminant, owing to its feeble luminosity when reduced in quantity, as has been already mentioned.

It is now recognised that the effect of yellow is produced by the excitation both of the red sensitive and of the green sensitive nerves in the eye. The division of the work of seeing between two sets of nerves, instead of being all thrown on to one set, has probably more to do with the greater comfort of using yellowish light than the less irritating effect of green as compared with red. The light may even be principally red, as is the case with orange, and still be less trying to the sight than is ruby alone. The effect of yellow may be produced either by spectrum rays about the D line, which affect both sets of nerves, or by the combination of red and green rays as effected by throwing overlapping discs of these colours from two lanterns on to a screen. The comparative luminosity and photographic safety of these yellows has not, so far as I am aware, been made the subject of any complete research. Concerning the mixed method of production I shall have something to say presently.

The use of light reflected from a coloured surface has been praised, and, it appears, justly so. Many years since, Mr. Warnerke described a

lamp which was fixed in the ceiling, and had a dome painted inside with vermilion. At the bottom of the lamp was a sheet of ruby glass. Mr. Cowan, some time later, showed a lamp of the safety and luminosity of which he gave a very high character. The back of the lamp was curved in a semicircle, and was lined with yellow paper. The front was glazed with glass of a greenish-yellow colour. In the middle was a gas jet which illuminated the yellow back, and a disc of tin was so placed as to prevent any of the light from the flame coming direct through the glass front. A lamp which gave me the greatest safety in comparison with its luminosity was one which I showed at the Photographic Society of Great Britain some years ago, and the light from which the then President, Mr. Glaiher, spoke of as white, though that, of course, would not be in comparison with daylight, but with gaslight as seen through various media. The back of this lamp was concave, or rather semicircular, and lined with yellow paper. On either side a lamp was boxed in, the side of the box facing the yellow paper being filled in one case with a green, and the other with a red, glass. Between the boxed-in lamps a space of about ten inches wide and fourteen inches high allowed the light from the yellow paper to shine through and illuminate the work-table. Details of some experiments with this lamp, in one of which Mr. W. K. Burton took part, were published at the time. A further security was obtained by covering the front with a single thickness of golden fabric. Both lamps might be fitted with ruby, and even then the light would not, I think, have the same trying effect as that coming direct through the ruby glass, though this is an experiment which I have not made.

It must not be forgotten that no light which enables us to see is free from effect on a sensitive plate, and therefore, whatever illuminant is used, the plate should not be exposed to it longer than necessary. A simple plan in a prolonged development is to have a window of, say, fifteen or eighteen inches in height, close down to the sink or work-table, and to raise the dish out of the direct rays, lowering it occasionally for inspection as may be necessary. I think, however, that with the lamp I have described the safety is so great that there should be little risk, with ordinary care.

W. E. DEBENHAM.

## FLORAL PHOTOGRAPHY.

### I.

For many years the photographing of flowers and various plants has been confined to only a few workers, who, perchance, may have had more than ordinary facilities of acquiring suitable subjects for this class of work; but, now that one of the leading horticultural societies in the United Kingdom has decided upon holding an exhibition of photographic work in connexion with its important Autumn Flower Show in the West of Scotland, arrangements for which Exhibition are in the hands of several of the best-known workers in the district, it is safe to assume that something like a fillip will be given to floral photography, not only in and around Glasgow, but likewise throughout the entire United Kingdom. It is almost certain other kindred societies will not be slow to take a leaf out of the book of the Glasgow and West of Scotland Horticultural Society, who may be said to be the first to move in this matter, and already quite a number of amateur and professional workers have signified their intention of contributing to the forthcoming display in St. Andrew's Hall.

The first important step in work of this kind is the selection of suitable subjects. These, it may be said, are only attainable at certain seasons of the year, as every one knows; but, during every month, from early spring onwards, there will be found plenty of delightful subjects that are specially amenable to photography. In springtime we have our crocuses, hyacinths, daffodils, tulips, lilies of the valley, snowdrops, and many other of the early flowering bulbs, all of which yield charming studies, especially the daffodils and lilies of the valley, these being followed by the early summer blooms, which are, again, in turn found giving place to multitudes of later summer and early autumn flowers; from which any one who feels inclined to give a little study to this class of work will be able to gather together an abundance of subjects for his camera—indeed, far more than he will ever be able to undertake in his spare moments.

As to the selection of subjects, these may be divided into three or more sections. First in importance undoubtedly stands cut flowers. These, it may be said, are at every one's control, even those not possessing a garden or greenhouse of their own. Secondly, in pot plants there will be found an unlimited field for selection, and these and the previous section are at all times capable of being placed in any desirable situation for being photographed; and, thirdly, we have almost as unlimited a field to work upon in flower-beds and borders towards autumn, that, if slightly more difficult to deal with in the way of photography, yield, when properly treated, charming results.

One of the first essentials in dealing with cut flowers and pot plants is a suitable background. This adjunct must be carefully studied, and it will be found, from among the many hues met with on the blooms, that a slight alteration in the tint of a background works wonders in the relief it is so desirable to attain. All those of a white hue are best relieved with a dark, but not absolutely black, colour in the background, for, in the writer's experience, this tends to the production of hard results, savouring



too much of the soot-and-whitewash description. Any one not having much experience in this work might imagine that the obtaining of backgrounds of varying colours means a serious outlay and expense, and thereby be deterred from undertaking this delightful branch of photography; but, in reality, such is not the case, for a few shillings at the outside will go a long way in supplying quite a large stock of various tinted backgrounds suitable for the work. As a rule, these backgrounds are not required to be of large size, a square of about four feet being a suitable and handy size for most ordinary work. A web of brown and thick white paper does not cost much, and an old broom handle or two can generally be picked up in most households. With these provided, the paper can be cut to any lengths, and glued after the fashion of a map to the broom handle. In this condition the paper can be colour washed to any tint that is desired, the pigment being mixed with a little size, or glue, or gelatine. For extremely close work, where minute subjects are to be rendered in their natural size, such as would be the case with pansies and violas, small backgrounds of velvet or grey-tinted, smooth, but not glazed, paper should be brought into requisition. The distemper tint, however, may be easily made and applied to a paper surface by mixing with ordinary whiting, size and water, a little lamp-black, which must be first mixed in water by itself until it forms almost a thick paste, and quite free from grit or small lumps. This black colour is then added, drop by drop, to the whitewash until any desired shade of grey is reached, it being borne in mind that the colour washes invariably dry a shade or so lighter in tint than it appears when wet. If a dark-brownish tint be desired, it is produced by adding a much greater quantity of lampblack, to which must be added a little burnt sienna powder mixed in the manner previously described for the lampblack, the chief point being always to add the colouring matter in liquid form. When a few of such backgrounds have been acquired, they may be altered from time to time if their tints do not happen to suit the particular subject being treated, and, if two or three rough but stout frames of about four to five feet square be provided, any background may be stretched thereon drum-tight before being colour-washed.

One of the most useful backgrounds the writer possesses, and which he has used for many years when photographing various plants and flowers for book illustration, is merely a long roll of brown paper; this is placed on the floor from the foot of the studio camera stand and extends to the wall in a curved form. The pot plant is placed on the top of the paper, standing on the floor, or sometimes, when a higher elevation is desired, on a small platform, and by this means the entire plant is shown standing upon its support, and the cut off through the middle effect, so often seen in this class of work, is avoided. A background of this description will enable a plant being photographed from any angle or point of sight—a matter of no small importance, when it is desired to look somewhat down upon the plant. Very many subjects will be found to yield charming results by placing them *in situ* on the floor of the studio and rearing the camera straight overhead. When this treatment is resorted to, it will be found that a special piece of apparatus is required to hold the camera in this vertical position; but this is easily made by any one possessing a couple of flat boards about half an inch thick and slightly larger than the tail-board of the camera. These are hinged together after the manner of a printing-frame back, a hole being bored through the centre of one to enable the camera screw being inserted, the other board clamped to the edge of a rough table or similar contrivance, and the two flaps nailed at their proper angle by means of a stout wooden guy rod. This enables a camera to be placed vertically over such subjects as a large assortment of cut flowers, which will be found to yield a charmingly natural position when such are, to a certain extent, indiscriminately gathered together and dropped upon the floor.

In work of this kind, amateurs especially will find the absolute need of having well-made, suitable cameras. Over and over again, in the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY, the writer and others have urged upon beginners the need of showing some discrimination when they purchased a photographic outfit. Years ago a well-made camera was recognised to be square both at back and front without any tapering, and no rack-and-pinion focussing arrangement was permissible, but all this has, within the last fifteen years, changed, and utility has almost entirely been sacrificed to portability. This we see painfully evident in the slim, tapered rack-and-pinion camera puzzles, with their brass kick-shaws and invisible springs with which a modern camera is now furnished. These cameras are unfit for very much useful work, and the branch of photography to which we are now referring, and which undoubtedly will, in the near future, become highly popular, is just one of the tests where a modern camera is tried and found wanting.

In vertical photography it very frequently happens that the camera has to be elevated so that the lens is exactly above the objects, and further, it is by no means uncommon that this can only be acquired by stagings which permits of the camera resting on its front, through a slot or hole in a board, the dark slide being on top of all, thereby adding considerably to its weight. Now, the uselessness of the rack-and-pinion form of focussing attachments will soon be evident and the immense superiority of the good old screw-rod attachment, alas! so seldom met with now, becomes an actual necessity. Were Judges at our Exhibitions where apparatus is displayed to show more judgment in their awards, and only recognise such form of cameras and other photographic

apparatus as are really of practical all-round utility, it would save much annoyance to many beginners, who, for the time being, are really not aware of the shortcomings of the apparatus they are acquiring.

In floral photography, where vertical adjustment of the camera is so often required, the rack-and-pinion focussing adjustment will not support the weight of a dark slide where any fairly large size of plate is used, and such cameras may be set aside as useless for all classes of photography where vertical adjustment is required.

T. N. ARMSTRONG.

## ILFORD PLATONA PAPER.

[Photographic Scrap.]

ILFORD Platona Paper, recently received from the Britannia Works Co., is a new platinum paper which will be welcomed by all those who desire to produce photographic prints that are not only highly artistic in appearance, but also have the great merit of being as permanent as the paper on which they are made. Since also the price at which it is offered is comparatively low, it seems not unlikely to lead to a considerable increase in the number of workers in platinotype.

The paper may be obtained in sheets or in various cut sizes and is put up in tins provided with a very convenient form of screw lid, fitted with an indiarubber washer that makes a practically air-tight joint when the lid is screwed down. After it has been opened the tin still serves for the safe storage of the paper that has not been used, and also as a receptacle for exposed but undeveloped prints.

Each tin as sent out contains a lump of calcium chloride for the purpose of keeping the contents quite dry. When the tin is first opened, it is advisable to take the calcium chloride out and leave it out, relying on the screw lid and washer to protect the paper left in the tin from the action of atmospheric moisture. To attain this end, care should be taken to screw the lid tightly down.

The paper is coated with a mixture of a ferric salt and a platinum salt, and the sensitised surface has a bright lemon yellow colour. In the samples that I have examined the coating was very uniform and the paper was free from any mechanical defects.

With Platona paper, as with any other platinum paper for development, success depends to a large extent on keeping the paper dry both before and during use, and also between exposure and development. It is important therefore that the pads of the printing frame should be quite dry, and it is advisable to place between the pad and the Platona paper a sheet of some waterproof material such as Willemsen paper, the oiled paper used in letter-copying presses, or thin sheet indiarubber. This precaution should be regarded as indispensable, especially during damp weather.

During exposure the yellow colour of the paper changes to dark purple-violet, and ultimately to dark orange when the maximum possible effect of light has been produced. The process is only partially a print-out process and the image on a properly exposed but undeveloped print is not very deep or distinct. To correctly estimate the exposure is the only difficulty that the process presents besides that of keeping the paper dry, and it is a difficulty that soon disappears with a little practice.

The undeveloped Platona print should show all the details in the shadows and the main details in the half-tones, but not the details in the lights. Care must be taken to examine the prints in weak light only.

After exposure the prints are developed by floating them on or immersing them in a solution of potassium oxalate and phosphate. The following formula, recommended by the Britannia Works Company, answers very well:—

Potassium oxalate .....	2 ounces.
Potassium phosphate .....	$\frac{1}{2}$ ounce.
Water.....	14 ounces.

The solution is most readily made by using hot water, and can be kept for any length of time. For use, a part of the stock solution is diluted with an equal quantity of water and placed in a clean porcelain dish. The prints are floated face downwards on the surface of the liquid, or may be immersed in it, taking great care in either case to prevent the formation of air bubbles or to remove them if they should form. The faint image begins almost at once to change to black and to become more intense. When development is complete, the prints must *not* be washed with water but must be placed directly into a clearing bath of dilute acid to ensure complete removal of the iron salts from the paper:—

Pure hydrochloric acid .....	1 ounce.
Water .....	80 ounces.

Place some of the dilute acid into three porcelain dishes, which we will refer to as Nos. 1, 2, and 3. The developed prints are placed in No. 1 and kept moving for about five minutes, they are then transferred to No. 2, and again kept moving for about five minutes, after which they are placed in No. 3 for five minutes and are finally well washed in running water, or in frequently changed water for about fifteen minutes. They are then dried.

It will be observed that the manipulations are very simple and occupy comparatively little time. If necessary, the drying of the prints can safely be accelerated by heat.

I have made a number of prints on Platona paper from negatives of



different kinds with uniformly satisfactory results; the colour is good and the gradations and the rendering of detail in the high lights are excellent.

Platona paper, like all other platinum papers, requires good negatives in order to get the most satisfactory results; they must show good contrasts with a considerable amount of detail in the shadows. Negatives that give first-class prints with the ordinary P.O.P. will also give first-class prints on Platona paper, whilst negatives that are very strong in contrast will give better results on Platona than on P.O.P.

Platona paper, therefore, affords a method of obtaining rapidly, and after a little practice, easily, prints of a kind that are usually recognised as being very pleasing and artistic in character, with the added merit of the maximum degree of permanence possible in photographic prints.

C. H. BOTHAMLEY, F.I.C., F.C.S.

#### ACTINOGRAMS, AND A SELF-RECORDING ACTINOMETER.

By "actinogram" I understand a record of the actinic value of a source of light traced upon a sensitive surface, such as silver-chloride paper or a silver bromide and gelatine film. Roscoe was one of the first to obtain these tracings, and at one time some extensive observations were undertaken at Kew, and by Captain Abney at South Kensington. The actinograms were made by the aid of Roscoe's actinometer, an instrument consisting of a revolving drum carrying a silver-chloride paper, with a driving-clock so arranged that at stated intervals small portions of the sensitive paper were exposed to light, for times ranging from a few seconds up to several minutes. At the end of the day the exposures were compared with a standard tint, and the strength of the light estimated from the depth of colouration. Abney also devised a rotating cylinder, with alternate black and white sectors, to facilitate the reading of the tints.

The actinograms obtained under these circumstances were intermittent, of the same nature as a series of individual readings, and like them, when extending over a long period, liable to fail at such times as to

tions based on matching one tint against another, the readings can be depended upon only within somewhat wide limits, and do not admit of that precision which a scientific method demands.

Since these early experiments of Roscoe, important advances have been made which render it possible to obtain actinometric records of much greater exactitude. I refer, firstly, to the introduction of rollable gelatine films; and, secondly, to Abney's work on measuring the transparency and opacity of the photographic negative. In my opinion these have an application to this subject which enables us to carry forward the work of early investigators, that has of late years been much neglected.

From these observations it may be gathered that the actinometer described below attempts to achieve a continuous record of daylight, or other source of illumination, and to establish with greater accuracy variations in the intensity of light than is possible with silver chloride, or other system depending on matching tint against tint.

Fig. 1 is a general view of the actinometer. A is a drum twelve inches in circumference, and six inches in length; attached to the driving-clock, B, and so designed that it revolves, without drag or start, once in twelve hours. C is a light-tight box to carry the drum and clock, in the lid of which is an opening, D, six inches in length, and so placed as to fall along the top of the drum when enclosed in the box. In this opening is fitted a scale of densities. The width of the slit must be regulated in accord with the length of exposure desired. The one I have in use is a quarter-inch wide, giving an exposure of a quarter of an hour, since the drum rotates once in twelve hours. The apparatus was made by Messrs. Watson & Sons, to whom I am indebted for several valuable suggestions.

From this description and drawing it is seen that on starting the drum an actinogram is the result, consisting of a series of bands, which are a quarter hour record of the light; taking them vertically, as in the ordinary actinometer, the intensity is given, whilst horizontally the length of time it was operative. Assuming the record to be printed on a film of gelatino-bromide, and developed with ferrous oxalate, or one of the non-staining developers, Abney's plan of measuring the transparency of negatives supplies a means of reading the actinogram within narrow limits, and covering a range of intensities much beyond the powers of a tint method. An instance will illustrate this: the scale of opacities I am at present using ranges, as measured, from 1 to 384; against this, on chloride paper, it is difficult to read differences greater than 1 to 150. In addition the readings are not so close, on a film transparencies as 1.3, 1.6, 2, 2.4, 3, are readily detected; on chloride paper the steps would be 5, 10, 20, 30. By this comparison the superiority of the silver bromide film and the Abney screen are evident.

My observations with films, however, are not yet complete, but, as through February, March, April, and May I have been making daily records with gelatino-chloride paper, I will explain the use of the actinometer, and the reading of the actinograms, by the aid of these experiments.

The scale in the actinometer consists of fourteen densities, and taking clear gelatine and glass equal 1, they run as under:—

1.0, 1.5, 2.3, 3.5, 7, 9, 15, 22, 50, 67, 110, 202, 307, 384.

The exposure is made in shadow, and at the end of the day I draw on the actinogram vertical lines one inch apart, marking each with the hour it represents. On squared paper I next write the hours along a base, and the relative opacities of the scale as vertical, fig. 2. A tint is then selected and traced through every hour, its position being marked on the squared paper; joining the points so noted the curve of the actinism is

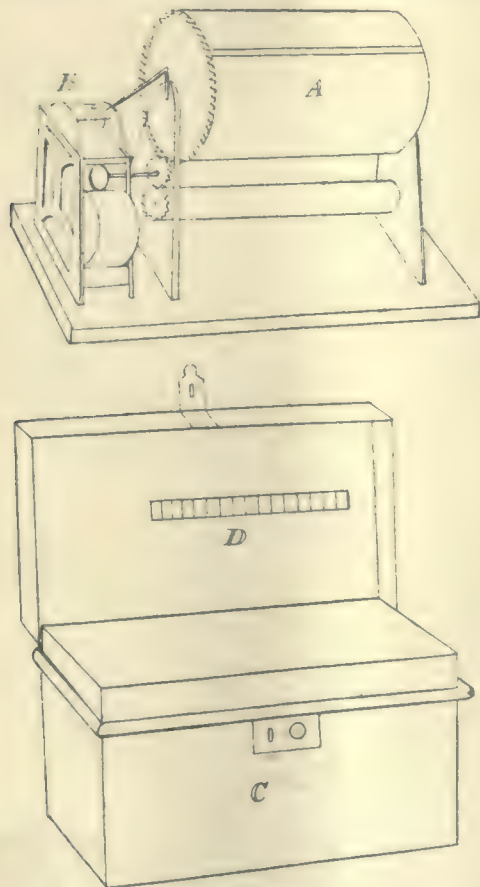


FIG. 1.

create a false impression of the actinic values. To approach nearer to the real values, all actinometric readings should be continuous, the variations in actinism being recorded as an unbroken band.

In using silver-chloride papers for actinometric purposes, the initial difficulty is in the correct valuation of the amount of colouration. A very slight acquaintance with the subject will force on one that the degree of accuracy attainable is not high; and, likewise, with all observa-

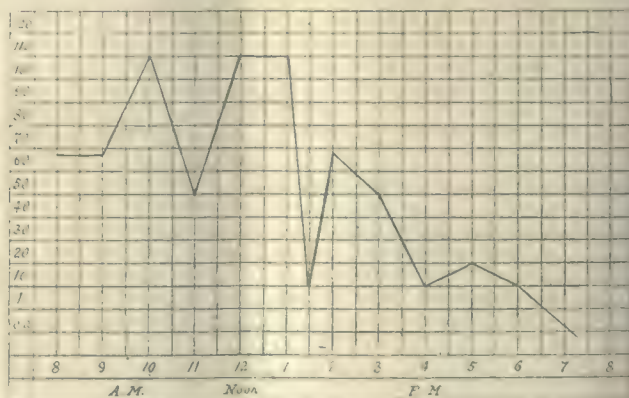


FIG. 2.

secured; fig. 2 represents a typical April day, the 15th day of the month of the present year. The tint chosen in reading is one which falls on the verge of being invisible, though other and darker tints might also be utilised. By treating each day in the month in this manner its characteristic curve is produced, and at a future time the meteorological features of any day may be ascertained by referring to its actinic curve. Summing up, and finding the average of the light values from 8 a.m. to 4 p.m. at Bournemouth during April, I arrived at the figures in the table below, compared with which are values from Dr. Scott, the Rev. Dwight



W. Smith, and from Kew, for the same month. The figures are reversed values indicating relative exposures.

	Dr. Scott.	Rev. D. W. Smith.	K w.	Bournemouth.	Mean.
8 a.m.	1.6	2	3	2	2.1
9 "	1.2	1.5	1.8	1.4	1.4
10 "	1	1.2	1.3	1.04	1.1
11 "	1	1	1	1.07	1
12 noon	1	1	1	1	1
1 p.m.	1	1	1.2	1.02	1
2 "	1	1.2	1.5	1.2	1.2
3 "	1.2	1.5	2	1.7	1.6
4 "	1.6	2	2	3.2	2.4

The agreement between the figures is not complete, owing, perhaps, to the fact of their being derived in distinct ways, or to the influence of locality; the Kew figures and my own are both from silver chloride paper, and the most alike, except that I found the morning light much the more actinic. The mean of the four shows that my readings approach nearest to the probable actinic values.

After the change in actinism from hour to hour, comes that from day to day, fig. 3 is the curve for Bournemouth during April. The values were calculated by taking the mean of the nine readings from 8 a.m. to 4 p.m. Thus on April 1st the mean was 40, on the 13th, 80, on the 21st

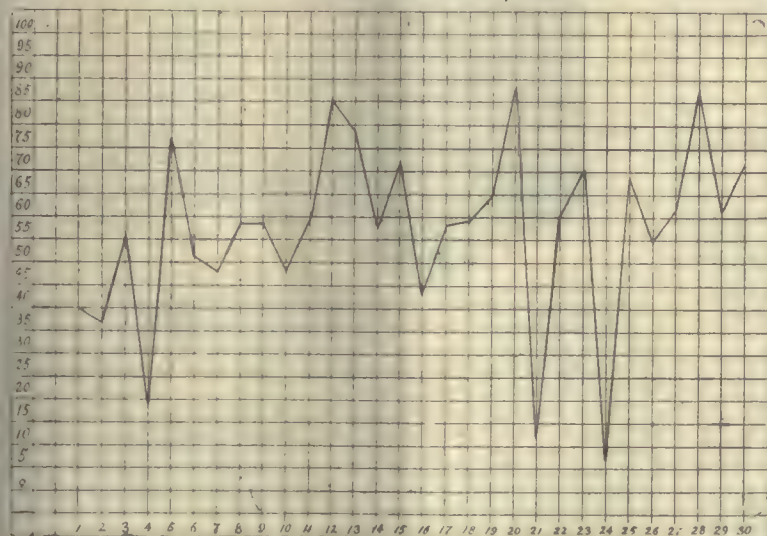


Fig. 3.

only 15. Altogether the fluctuations from day to day are very great, sustaining the reputation of April as a changeable month. The very dull days were but three, the 4th, 21st, and 24th, whilst there were four days of exceptional chemical activity, the remainder being fine clear days of normal actinism. April 19 was a cloudless day, and may be taken as the normal for the month. The four bright days, 5th, 12th, 20th, 28th, were cloudy days, or rather, best described as "the sun seen through a light mist." By itself this actinogram is not so instructive as it would become in comparison with others from neighbourhoods less favoured than Bournemouth.

JOHN A. RANDALL.

#### ARTISTIC COPYRIGHT.

The following correspondence recently appeared in the *Standard*:—

"To the Editor of the '*Standard*.'"

"SIR,—In your report of my evidence on Artistic Copyright in the *Standard* of June 20, I am represented to have said to the Select Committee, 'If cheap reproductions were allowed, &c. Engravers have no objection to cheap reproductions provided they do not pretend to be expensive engravings and works of fine art. I should be sorry that process workers should think I had said anything so illiberal; it must have been a misunderstanding on the part of the reporter. As it is not unlikely to cause a lot of process workers to want to give evidence before the Committee, imagining that I had made an attack on them, complicating an already complicated affair, about which misunderstanding:

enough already exist, I trust you may kindly take an opportunity of setting the matter right in the *Standard*."

"Colourable imitations' only are aimed at in my paper, not legitimate process works.—I am, Sir, your obedient Servant,

"Newton Manor, Swanage, June 27."

"GERALD ROBINSON."

"To the Editor of the '*Standard*.'"

"SIR,—Mr. Gerald Robinson's letter in the *Standard* of this date fails to remove the impression produced upon the minds of process engravers by the evidence he is reported to have given before the Select Committee. He objects to the definition of engraving contained in the Bill as being too comprehensive, and as levelling any distinctions which now exist between artistic engraving and what he calls mechanical engraving. If he did not intend to include process engraving in the latter category, he certainly selected a very unfortunate expression; and, if he did include it, then process engravers have some reason to complain.

"The distinctions to be drawn between different methods of engraving are so subtle that they are capable of any amount of discussion; but, for the consideration of the purpose of this Bill, they are entirely irrelevant. Although the process-engraving industry is affected to a very considerable extent by the proposals of this Bill, the Association has not yet attempted to intervene, because it has recognised that the Bill is a laudable attempt to settle the whole question of artistic copyright on an equitable basis, and because it recognises the difficulty of reconciling so many conflicting interests. The greatest objection to it as drafted is that it does not make sufficiently for simplicity, and draws apparently unnecessary distinctions between original works of art and other artistic productions. A further objection is that in some cases copyright can only be conferred by registration, while in others registration is unnecessary except as a condition precedent to proceedings against infringement.

"As Mr. Robinson remarks, the question is complicated, but the complication is not likely to be diminished if an attempt is made to distinguish between different methods of engraving, to the detriment of the process worker.—I am, Sir, your obedient Servant,

"WALTER BOUTALL, Chairman.

"47, Lincoln's Inn-fields, London, W.C., June 29."

#### MAYALL'S SYSTEM OF DEVELOPING PRINTING-OUT PAPER.

THE well-known photographer, Mr. J. P. Mayall, whose works are at 10, Eye Hill-park, Peckham Rye, S.E., has for some time past been working at the problem of completing by development partly printed images on gelatine and collodion papers, and has met with an amount of success that has induced him to engage commercially in this branch of photographic printing.

It is not by any means the first time that this interesting process has been attacked with a view to rendering it amenable to regular adoption by photographers and trade printers; but, so far, it can hardly be said that the efforts expended have been followed by commercial, as distinguished from mere laboratory or experimental, success. We ourselves have produced pleasing single pictures by development of a partly printed-out image, but, in company with others, we have experienced the great difficulty of getting either regularity, uniformity, or variety of tone at will. In other words, development plus toning failed to yield the results obtained without difficulty by printing out plus toning.

Mr. Mayall claims to have overcome these difficulties, and the results he has submitted to us appear to bear out his claims. He showed us numerous specimens on developed collodion, gelatine, and albumen papers, and the tones of the prints were not only of the best photographic colours, but they have a wide range, and appear, by the number produced for our inspection, to be easily and uniformly obtainable. It is in the latter respect that the crux of the matter lies. Mr. Mayall offers to produce from a sample print any number of copies by development which shall match the original in gradation and colour. There should be a decided future for a developing process having these properties, for we and others have long contended that a reliable system of developing partly printed surface papers would be appreciated by professional photographers and trade printers.

#### THE AMERICAN INSTITUTE PHOTOGRAPHIC SALON.

MR. H. SNOWDEN WARD writes: "Enclosed I hand you a prospectus of a Salon to be held by the American Institute. This organization is (in its aims) a sort of hybrid between our British Association and our Society of Arts. It was established about 100 years ago, and in the early days of the century did a great work for American manufactures and applied



arts by the holding of exhibitions, giving of medals, &c. Latterly it has become simply a scientific and artistic society, having various sections (Electrical, Medical, Musical, Mechanical, Photographic, &c.), each holding its regular meeting independently of the other, and, as the Institute has considerable property, it has been accumulating funds. Some of its more progressive members have recently induced it to move from the premises it has occupied for the last few years to a building which they consider more worthy of its earlier traditions, and which provides some fine exhibition rooms. The Photographic Section considers itself fortunate and highly honoured by being allowed to manage the Exhibition with which the new rooms will be opened. For British workers the Committee has arranged a small British Committee of Selection, which will consider the works, and the American Institute undertakes that all works sent forward by that Committee will be hung without further selection, and they have also undertaken to pay carriage, duty, and all similar charges from London to New York and back again. I think, therefore, they have done everything possible to meet British wishes, and, as they have asked me to undertake a portion of the correspondence for them, I am naturally anxious that their Exhibition should be a thorough success. You will see from the prospectus that no awards are offered except a certificate of acceptance for every one whose work secures a place. This certificate will be executed in photogravure, and will be an exceedingly handsome thing. There is no feeling of rivalry or competition between the Salon of the American Institute and that which is being arranged by the Philadelphia Photographic Society. The date of the New York Exhibition was necessarily fixed by the date of the opening of the Institute's new premises, and the Exhibition was decided upon at a time when it was not expected that the Philadelphia Salon would be repeated this year. It is unfortunate that the dates prevent the pictures being sent from the Philadelphia to the New York show, but this seems impossible, as the time between the closing of the former and the opening of the latter is too short for hanging, cataloguing, &c. Copies of the prospectus will be sent to secretaries of societies, or to would-be exhibitors, who may write for them."

#### THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM, GLOUCESTER, 1899.

The following is the synopsis of next week's proceedings:—

**MONDAY, JULY 10:** Excursion to *Elmore, Fretherne, and Frampton-on-Severn*.—Trains leave head quarters at 12 noon; lunch at Bell Hotel, Frampton, at 2.30. At the Guildhall, at 7.30, official opening of the Convention by the Mayor, after which the new President (Mr. W. Crooke) will deliver his Presidential Address, followed by a "Demonstration of Colour Photography," by Mr. R. Child Bayley, and an exhibition of specially selected lantern slides.

**TUESDAY, JULY 11:** Excursion to *Berkeley and Berkeley Castle*.—Trains leave Midland Station at 10.0 and 10.55; luncheon at Berkeley Arms Hotel, at 2.30; return trains from Berkeley Station at 3.15 and 5.22, arriving in Gloucester at 4.0 and 6.40. At the Guildhall, at 8 a paper on "Fundamental Points concerning Development," by C. H. Bothamley, followed by an exhibition of lantern slides by members of the Gloucestershire Photographic Society.

**WEDNESDAY, JULY 12:** Members will be officially conducted over the Cathedral at 2.0. *Note.*—The Dean has kindly given permission for the members to photograph the interior of the Cathedral at any time during the meeting, except during the hours of Divine Service. At the Guildhall, at 10.0, the Annual General Meeting and election of Council for the ensuing year. At the Spa Cricket Field, at 12 noon, the official Convention Group will be taken. At the Bell Hotel (head-quarters), at 7.0, Annual Dinner and Smoking Concert.

**THURSDAY, JULY 13:** Excursion to *Chepstow, Tintern, and Symonds Yat*.—Trains leave Great Western Station at 9.29, arriving at Chepstow at 10.20. *Note.*—Luncheon will be provided at Chepstow for those members who have arranged to drive over the Wyndcliffe to Tintern. A special train leaves Chepstow at 12.30, arriving at Tintern at 12.45; luncheon at Beaufort Arms Hotel, Tintern, from 1.0. Trains leave Tintern at 3.8 and 6.51, arriving at Symonds Yat at 3.52 and 7.36; train leaves Symonds Yat at 8.33, arriving in Gloucester at 10.0. There will be no meeting at the Guildhall on Thursday evening.

**FRIDAY, JULY 14:** Excursion to *Ashleworth, Deerhurst, and Tewkesbury*.—The steamer *Avonmore* will leave Westgate Bridge at 9.30. The times of the steamer's departure from Ashleworth, Deerhurst, and Tewkesbury will be announced on arrival at each of these places. Luncheon will be served on board after leaving Deerhurst. At the Guildhall, at 8.0, a paper on "Binocular Vision and the Stereoscope," by Mr. Thomas Bedding, F.R.P.S., and "Wordsworth Country," by Percy Lund, followed by an exhibition of specially selected lantern slides.

**SATURDAY JULY 15:** Various short excursions to places in and around Gloucester will be arranged as may be required. Among those easily accessible are Highnam, Matson, Hempstead, Cheltenham, Ledbury, Forest of Dean, &c. Members will oblige by signifying their wishes to the Hon. Secretaries as early as possible, in order that satisfactory arrangements may be made for the desired excursions, and particulars duly posted on the notice board.

## Our Editorial Table.

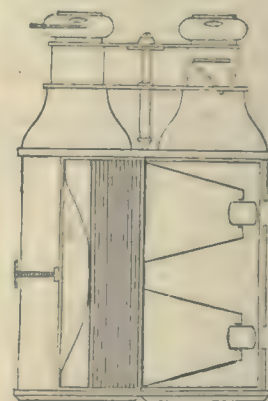
### THE "STEREOSCOPIC" BINOCULAR CAMERA.

W. Watson & Son, 313, High Holborn, W.C.

We have examined this clever binocular camera and several transparencies printed from negatives obtained in it, and were very pleased with the instrument itself and the excellent stereoscopic results it is capable of yielding. In use, the instrument points in one direction, but the view taken is that in another, namely, to the left of the photographer, hence the camera is really a "detective" one. The following extracts from the instructions for use give the reader a good idea of the principles upon which the camera is constructed:—

"The camera is held to the eyes in precisely the same way as a field glass, but care must be taken that the left hand does not obstruct the angle of view of either of the two lenses.

"The view to be taken is seen in a finder provided and placed in the left tube of the camera; it is in exactly the same plane as the lenses.



Sectional View, showing Position of Plates.

"Changing the Plate.—After an exposure has been made, first record it in the numbered disc, revolving in the eye end of the camera; then open the back, *r*, pull out the bag and draw, by means of the projecting ring, the exposed plate into the bag. This plate is then replaced in the back of the magazine.

"When twelve plates have been exposed and changed to the back of the magazine, there remains in front an aluminium sheet, which, by keeping the magazine light-tight, enables it to be drawn out in daylight and another magazine inserted. Before the magazine can be drawn out, the clamping screw must be loosened and screwed up again after the magazine is replaced.

"No focussing is required, all objects from six feet to infinity being focussed sharply on the plate."

The sectional view gives a good idea of the construction of the camera, which presents the appearance of a pair of handsome field glasses. For taking stereoscopic photographs of people unawares, it is a clever arrangement, the real object of which is well calculated to deceive the multitude.

### "AGFA."

A. & M. Zimmermann, 9 and 10, St. Mary-at-Hill, E.C.

We described the salient characteristics of Agfa in the *JOURNAL* a few weeks ago, and a practical trial with a sample bottle that we have since received enables us to confirm the claims made on its behalf. Agfa, so far as we can judge, is a really good and useful intensifier, which many a photographer will appreciate. Being colourless, it is cleanly to work with, and it is certainly a very great convenience that it enables intensification to be effected straight away—that is to say, it is not necessary to follow it with a blackening solution. There is the further point in its favour, that it may be used for positives as well as negatives.

### AURIA SELF-TONING PAPER.

G. Houghton & Sons, 89, High Holborn, W.C.

THERE appears to be a considerable demand for silver printing-out papers of the self-toning kind which only require fixation and washing to complete the image. Auria is a collodion paper, issued with glossy and matt surfaces, both papers giving tones which leave nothing to be desired in the way of agreeable colour, purplish tones with the glossy and sepia



with the matt being their characteristics. The following are the instructions for working:—

**Printing.**—Print a shade darker than desired in finished prints, using tissue paper if printing in the direct sunlight.

**Fixing.**—Prints may be put direct from the printing frame into the hypo bath, but, to prevent getting spots in the finished prints from air bubbles, &c., it is advisable to first place the prints in clear water until thoroughly soaked, and then into the fixing bath, consisting of 1 ounce of hyposulphite of soda (crystals) and 20 ounces of water, hydrometer test 20. Then wash in running water until the hypo is entirely removed; this takes about an hour. If running water is not available, at least eight changes of clear water should be used.

**Burnishing.**—Prints on this paper can be burnished in the same way as any other papers. For matt-surface paper, of course, a cold burnisher should be used.

**For Platinum (Black-and-White) Effects.**—Print several shades darker than desired in the finished print. Wash the prints in three changes of clear water, and then place them in any good platinum bath until the reddish-brown disappears from the deep shadows. After this, give one wash in clear water, and then place in hypo solution, as above directed.

#### THE "AXE" BRAND P.O.P. AND BROMIDE PAPERS.

Fuerst Brothers, 17, Philpot-lane, E.C.

UNDER the above designations Messrs. Fuerst Brothers are introducing two new printing papers. They inform us that the P.O.P. is made in two grades, viz., "Brilliant," for soft negatives, and "Soft," for hard negatives. The glossy surface is made in the following colours: white,



pink, and mauve, and matt surface in white only. The platino-bromide paper is made in three grades, viz., A, B, and C. A, matt surface, or contact printing, smooth or rough; B, matt surface, for enlargements, smooth or rough; C, glossy surface, for contact printing or enlargements, thick or thin. The matt surface paper can be supplied extra thick for post cards, &c., if required.

RECEIVED: *Corriere Letterario della Libreria Antiquaria di U. Hoepli*, 7, Corso Vittorio Emanuele, Milano. Many standard photographic books are included in this list, which might be worth the while of book collectors to apply for.

## News and Notes.

PHOTOGRAPHIC CLUB.—July 12, at eight o'clock. Members' Open Night.

Mr. L. A. COCKWR, M.P.S., of 63, Mostyn-street, Llandudno, informs us that he has erected a dark room for the use of visitors.

THE new Hon. Secretary and Treasurer of the London and Provincial photographic Association is Mr. Walter D. Welford, 19, Southampton-buildings, Chancery-lane, W.C.

VISITORS to the Convention may wish to avail themselves of the facilities offered by the Cathedral Photographic Depot, 7, College-street, Gloucester, which has a dark room, supplies of material, &c.

A BOOK of *South African Portraits* is published by Messrs. Frederick Warne & Co. It contains no fewer than 120 reproductions (with biographical etches) from photographs taken by Messrs. Elliott & Fry, beginning with Queen, Sir Alfred Milner, and Mr. Chamberlain.

Messrs. JOHN H. AVERY & Co. have recently established themselves as photographers at 164, Strand, W.C. Mr. Avery's forte, it is well known, is architectural photography, a branch in which he has achieved many conspicuous successes. We wish the new firm a prosperous career.

SOME satisfactory photographic results were obtained last week from Mr. Spencer's balloon, which ascended from the Crystal Palace. The aeronaut, accompanied by Mr. Frank Foulsham and Miss Gladys Tussell. The atmosphere was clear, and good views of the Tower Bridge, Isle of Dogs, Greenwich Hospital, Royal Observatory, and Victoria and Albert Docks were obtained.

CHANGES AT THE SCIENCE AND ART DEPARTMENT.—Major General Sir John D. Donnelly, K.C.B., has retired from the Secretaryship of the Science and Art Department, and in consequence the Duke of Devonshire (Lord President of the Council) has made the following appointments: Sir George W. Keble, the present Secretary of the Education Department, to be also Secretary of the Science and Art Department; Captain W. de W. Abney, C.B., to be Principal Assistant Secretary of the Science and Art Department; Mr. W. Abney, C.B., to be the Principal Assistant Secretary of the Education Department.

THE new schedule has been issued for the "One and All" Flower Show, to be held at the Crystal Palace in August, in connexion with the Annual Co-operative Festival. The schedule this year is in two parts, forming two illustrated pamphlets, running into about 140 pages, and containing offers of prizes calculated to stimulate every kind of horticultural excellence amongst working men, women, and children throughout the kingdom. The photographic classes have been extended to thirty-four in number, and are this year divided into two sections, the first of which will be judged from a horticultural point of view, and the second by their artistic merits as photographs. Copies of either schedule may be obtained free of charge from the Hon. Secretary, Mr. Edward Owen Greening, at 8, Agar-street, Charing Cross, W.C.

CHEAPENING LIQUID AIR.—Dr. Ostegren, of New York, who has made exhaustive experiments with liquid air, announces that he has invented an apparatus, which, when tested in the presence of expert witnesses, proved equal to turning out liquid air at the rate of 1500 gallons daily. The product registered 400° below zero. It can be made at a cost of five cents per gallon. The basis of Dr. Ostegren's present apparatus is a steam engine of 100 horse power. He believes that, with a more modern engine, he could produce liquid air at two cents per gallon, at which price he could enter the market with a view to the wholesale exportation of liquid air, both as a refrigerant and as a motive power. Coincidentally with Dr. Ostegren's discovery, Mr. Brady, of Chicago, announces that he has patented a cask in which liquid air may be safely carried.—*Laffan*.

PHOTOGRAPHERS SENT TO GAOL.—At the Lindsey Quarter Sessions, on Friday, June 30, Robert Audas, aged forty-three, photographer, and Frederick William Hart, aged thirty-four, photographer, were charged with feloniously stealing 14. 1s., the moneys of William Brown Nicholson, of Northorpe, on April 22 last, and also with stealing 10s., the moneys of Robert Morris, of Scotton, on April 25 last. The charge of obtaining the 10s. from Morris was first gone into. The prosecutor stated that he was a farmer at Scotton, and on April 25 the prisoners, who were apparently travelling the country and taking photographs, presented themselves at his house, and suggested that he should have his house and family group taken. He eventually agreed to have a family group taken outside the house. After the photograph had been taken, it was suggested that payment was necessary, and he parted with 10s. to the prisoners, for which he received a receipt. The men then went away, but the proofs did not arrive. Mr. Morris wrote, making inquiries, but received no reply. For two months nothing more was heard of the prisoners, but on June 16 Mr. Morris received the proofs; however, that was after prisoners had been arrested on another charge. Counsel, on behalf of the prisoners, said the question for the jury to decide was whether there was any intention on the part of the prisoners to supply the photographs in the first instance. For the defence, it was contended that the transaction was a *bona fide* one, but that some delay took place in executing the orders, owing to the weather. Delay in executing an order was not proof of intention to defraud. The prisoners were eventually found guilty and sent to gaol for four months with hard labour each.

## Patent News.

THE following applications for Patents were made between June 19 and June 24, 1899:—

PROJECTION APPARATUS.—No. 12,835. "Improvements in and relating to Stop Mechanism for Photographic Cameras, Projectors, and the Like." Complete Specification. W. STEVENS and W. S. BELL.

AUTOMATIC APPARATUS.—No. 12,846. "Improvements in Automatic Photographic Apparatus." J. E. GREGORY.

CAMERAS.—No. 13,152. "Improvements in or relating to Photographic Cameras." A. I. ADAMS.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
11.....	Birmingham Photo. Society	Presentation of Prizes awarded at the Annual Exhibition, by the President.
11.....	Hackney	"Dekko" Printing. A. E. Robins.
12.....	Photographic Club	Members' Open Night.
13.....	Hackney	Excursion to Cheshunt. Leader, H. J. Webb.
14.....	Croydon Microscopical	Conversational Meeting.
15.....	Borough Polytechnic	Excursion: Hayes and Keston Commons. Leader, W. Mundy.
15.....	Croydon Microscopical	Excursion: Coulsdon, Chaldon, White Hill, and Caterham. Leader, A. J. Hogg.
16.....	South London	Sunday Excursion.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 29.—Annual Meeting.—Mr. H. Vivian Hyde in the chair.

The retiring HON. SECRETARY (Mr. T. E. Freshwater) read the annual report, as follows, with the balance-sheet, which were duly adopted:—

In presenting the annual report of this Association I think we may congratulate ourselves upon a successful and useful session. Neither in the attendance of members nor in the interest shown in our papers and discussions has there been any falling off; and, if I may be allowed to say it, I think



a more correct idea of a photographic society's position is to be gleaned from the general and continuous interest week by week than by one or two very special evenings during a year with the rest more or less unimportant. We have to find something every week that will prove useful and instructive, and I think the reports of our meetings in the photographic press will amply prove that during the year just ended we have been able to keep the ball rolling most effectively.

I believe, too, that some of the newer or younger members have come more to the front, and taken their share in our proceedings. The more this is done, the better for our Association. In my last report the younger members were appealed to for papers, &c., and, although they may not have come forward in this respect as much as we should like, yet they have rendered assistance in the discussions and taken part in the management.

The following is a list of the papers read, demonstrations given, or discussions opened; but, in connexion with this, it must be remembered that, during the months of July and August last, no programme was made up, and no formal papers read, but the objects of interest shown and the discussions upon various topics during those two months were, nevertheless, ample substitutes. It was during this period that the prolonged discussion upon "The Exposure in Shadow and Diffused Light" took place, and this formed the subject of our first formal paper:—

"Exposure in Shadow and Diffused Light," Mr. Walter D. Welford. "Soda Formate Toning," Mr. A. L. Henderson. "Standards and Uncharitableness," Mr. Walter D. Welford. "Pyro-soda Development," Mr. Ben Edwards. "Forty Years Ago," Mr. S. Herbert Fry. "Rapid Plates versus Slow," Mr. W. T. Wilkinson. "Birch and Bracken," Mr. W. Thomas. "Phosphorescence in Relation to Photography," Mr. C. F. Townsend. "Lantern Experiments Relating to Colour," Mr. T. E. Freshwater and Mr. E. J. Wall. "Novitas Stripping Film P.O.P. and a New Method of Toning Silver Prints," Mr. Otto Scholzig. "Abolishing the Dark Room," Mr. Howard Farmer. "Development of P.O.P.," Mr. T. E. H. Bullen. "Photographic Society Life," Mr. Walter D. Welford. "Intensification and Reduction," Mr. John McIntosh. "Chat on Photographic Lenses," A. T. Harris. "Photographing Insects," Mr. T. E. Freshwater. "Modern Hand Cameras," Mr. J. E. Hodd. "Exposure and Development," Mr. W. T. Wilkinson. "Exhibitions, Technical and Otherwise," Mr. R. Child Boyley. "Important Photographic Problems," Mr. Herbert S. Starnes. "Modern Photographic Lenses," Mr. T. E. Freshwater. "Stereoscopic Photography," Mr. J. E. Hodd. "The Past Year and the Future," Mr. Walter D. Welford.

As regards Lantern Nights, the past year has been quite up to the standard, and we have had the following interesting lectures: "Corsica," Mr. A. L. Henderson. "The Cumberland Fells," Mr. Walter D. Welford. "My Visit to America," Mr. H. Snowden Ward. "Palestine and Turkey," Mr. P. R. Simmon, whilst some excellent slides have been shown by Messrs. Fry, Medland, Teape, Freshwater, Tom Bright, Bullen, Rapson, Ben Edwards, and others.

During the year we have had two special events, to which reference must be made. On February 9 there was the Supper, at which seventy members and friends were present. It was somewhat of a venture or experiment, but the result proved its popularity and success. It brought amongst us some old and good members, whose presence we should like oftener. A most enjoyable evening was spent, and every one appeared to appreciate the efforts of the little committee that engineered it. We have also to thank Mr. Henderson for his hospitality and kindness to us upon our recent visit to his residence at Brimsdown.

It will be seen from the list of papers read, lantern lectures, &c., that the number reaches twenty-six, so that once a fortnight we have had a formal paper or lecture, to say nothing of the many interesting communications made to, and discussions got up by, the Association.

As regards the number of members, there has been a fair number of new men elected, but not so many as one would wish. Some of the old members have gone away, and I wish to impress upon all the absolute necessity of keeping up the numbers by getting new men to join our ranks.

By the balance-sheet that I have had the pleasure to present to you, you will see that we have plenty of money in hand, and that our income has been considerably more than our expenditure, which was not the case last year.

The following is the result of the election of officers and Committee for the ensuing year:—*Trustees*: Messrs. A. Haddon and J. B. B. Wellington. *Committee*: Messrs. R. Bickett, R. P. Drage, T. E. Freshwater, S. H. Fry, J. E. Hodd, H. Vivian Hyde, A. Mackie, and J. S. Teape. *Librarian*: Mr. E. T. Wright. *Curator and Lanternist*: Mr. Haskins. *Recorder*: Mr. J. W. Hoiges. *Hon. Secretary and Treasurer*: Mr. Walter D. Welford.

Votes of thanks were passed to the retiring officers and Committee.

Mr. S. H. Fry presented a framed enlargement from one of Mr. Henderson's negatives, taken on the occasion of the recent outing to that gentleman's house at Brimsdown, for which he was accorded a vote of thanks.

Several other prints taken at the same time were passed round by the members.

Mr. J. E. Hodd showed a hand camera fitted with Sanderson's rising front. Mr. Philip Everitt showed some further trials of the new Platona paper. Reference to last week's report shows that the phosphate of potash prescribed had not been used, but Mr. Everitt now brought forward results comparing Platona paper developed with oxalate and phosphate respectively, and both with platinotype paper. He drew attention to certain mottled marks on a Platona print, and mentioned that he had ascertained the cause to be the withdrawal of the print from off the bath before it was fully developed. If allowed to remain until the image was completely out, the defect would not appear. Phosphate seemed to yield a colder tone with the Platona paper than did the oxalate.

#### PHOTOGRAPHIC CLUB.

JUNE 28.—Mr. H. Vivian Hyde in the chair.

Mr. E. W. FOXLEE showed some photographs by Mr. A. S. Whitcomb, of Buenos Ayres, which had been sent over for exhibition, at the request of the

President of the Argentine Republic, at the recent bazaar at the Albert Hall. Mr. Foxlee thought the examples, which comprised portraits and groups varying from cabinet size to 20 x 16 direct, spoke well for the status of photography in South America. They were on matt-surface collodio chloride paper of Mr. Whitcomb's own preparation, and he found that this style took very well indeed with his customers, his work being now largely executed therein.

Mr. H. SNOWDEN WARD, in reference to a remark upon the greater difficulty of getting orders for large direct work than in executing it, said that for years the cabinet had been the smallest print made in the States professionally, and that large direct photographs, such as those shown, were much favoured.

A number of slides were subsequently seen upon the screen, being some sent in for display at Convention meetings at Gloucester, and Messrs. Bridgman, Bridge, and Wellington passed judgment thereon as the Selection Committee.

**Ashton-under-Lyne Photographic Society.**—This Society had an excursion to Llangollen on Saturday. Mr. Charles Lord was the leader and provider—a sort of earthly providence. The "engaged" carriages had on them "Mr. Lord's excursion," and some irreverent individual perpetrated the unhallowed joke, "The train is the Lord's and the fulness thereof." That, however, was only partly true, for many other excursion parties to the same destination were hooked on to the same train at Chester, and quite an extraordinary number turned out when the train stopped at Llangollen. It is a very fine place for a day trip, not too far to go, and not too much to do when you get there. The hills are not big enough to break your neck if you look up to their tops from the valleys, and, if you want to get to the summit, it is not a business of half a day to get there and back. Then, whichever way you turn, you are charmed with the beauty of the scenery, with the green and well-wooded hills all round, the rocky river bed, the curious old bridge, and the umbrageous walks in all directions. The weather was all that could be desired, except that for the photographers the wind ruffled and rustled the trees too much. On the journey home the party were informed at Chester that they had missed the connexion, and would have to wait forty minutes. The carriages were left standing on the interior line of rails, so that the passengers could not get to the platform without crossing another line of rails and getting helped up to the platform. Many preferred to get out, and went to have a walk about the old city. When they returned at ten minutes to nine, they found that their engaged carriages had gone half an hour before with their cameras and other belongings. Others were informed before they left the station that the carriages would be taken forward by an earlier train, and they returned in time to resume their seats. The upshot of these proceedings was that the photographers did not all arrive in Ashton at the same time, but by three different trains, some before eleven, some after eleven, and some after twelve. No doubt some of them have had a good deal of seeking to recover their stray cameras.

#### FORTHCOMING EXHIBITIONS.

- 1899.
- Sept. 22–Nov. 4 ..... Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.
- " 25–Nov. 11..... Royal Photographic Society. Hon. Secretary, Colonel J. Waterhouse, 12, Hanover-square, W.
- October 18–24 ..... Croydon Camera Club.
- " 22–Nov. 19... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.
- Nov. 27–Dec. 18 ..... American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.
- December 7–9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

#### Correspondence.

\* \* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM: GLOUCESTER MEETING—CHEAP EXCURSIONS.

To the Editors.

GENTLEMEN,—Members from London may be glad to avail themselves of the following excursions:—

From Paddington for Gloucester, Friday, July 7, at 4 2 p.m.; Sunday July 9, at 8.15 a.m.; Monday, July 10, at 8 a.m.



Tickets available to return by the train leaving Gloucester at 6.20 p.m. on either July 13, 17, 20, or 24: ten shillings for the double journey.—I am, yours, &c.,  
F. A. BRIDGE, Hon. Secretary and Treasurer.  
Gloucester address, Wellington Hotel.  
East Lodge, Dalston-lane, London, July 1, 1899.

## CELLULOID MEASURES.

To the EDITORS.

GENTLEMEN,—I was sorry to see in your remarks, page 392, your views in justification of the British manufacturers not placing celluloid measures on the English market. They are made in Germany and sold in large quantities. I have one, and I find it exceedingly useful and quite accurate enough for all ordinary purposes. No one with any pretensions to a knowledge of chemistry would think of measuring ether, &c. in a celluloid measure than they would measure fluoric acid in a glass vessel. I am not a believer in the "conscientiousness" of the British workmen. Another case came under my notice. A manufacturer was asked for a quotation of a small quantity of an elastic substance drawn out like wire used here by surgeons as probes and made in Germany; they replied that "they would not make less than three cwt., and then they would not guarantee that it would answer the purpose."

Very conscientious of them. I hope that the question and want may catch the eye of some German or American manufacturer, and before long we will have them in the English market in English measure. They should be of cylindrical form without feet and nested say from one to ten ounces.—I am, yours, &c.,  
A. L. HENDERSON.

## DEVELOPING SPECTRUM AND PANCHROMATIC PLATES.

To the EDITORS.

GENTLEMEN,—An obstacle to the use of these plates is the supposed necessity of using either a special safe light in the dark room or an exceedingly feeble one. I have, however, used many of these plates during this season and last for colour and other photography, and have never used a dark-room light at all with them, but have yet secured complete control of results with ease and comfort. It is done by testing the developer beforehand with a trial slip, and then timing development by the appearance of this.

I shall be at the Gloucester Convention next week (except on Wednesday) and hope to give a short dark-room demonstration of the method, at such time or times as may be convenient, to interested persons.—I am, yours, &c.,  
ALFRED WATKINS.

Hereford, July 1, 1899.

## PHOTOGRAPHY IN DOTS.

To the EDITORS.

GENTLEMEN,—By the courtesy of one of your readers, Mr. Batten, of this town, I have had my attention drawn to the communication of Mr. F. G. Willatt in a recent number of your JOURNAL, and supposing that probably the subject brought forward by him may be deemed of considerable interest to many of your readers, I would venture to suggest that the "evolution" of an improved and workable grained screen, as forecasted in Mr. Willatt's communication is already a *fait accompli*.

With this I am enclosing a print grained by the placing of a "metzograph" screen over but not actually touching the negative used for the printing, such negative, however, exhibiting the marks of previous retouching. Mr. Batten is preparing more suitable prints prepared both to show the results of the screen when used either for printing or within the camera for imparting a "metzo" grain to the negative, either for studio or process work.

As, however, it is the more novel features and advantages offered by "metzograph" screens that I would ask leave more particularly to bring under your notice, I would remark that, together with a grain of any desired fineness, by my process there is compassed the desideratum of both an ungeometrical and sufficiently regular distribution of the size of the grain.

Further, as concerning the absolute novelty of the mode of preparing these screens, I have no doubt that will be deemed sufficiently obvious on perusal of the description of the analogous procedure in the preparation of Listulin dressings as set forth in the accompanying paper.

I would add that my patent, embodying both the first sublimation of betulin direct from birch bark, and utilisation of same for various purposes, is, in this country, No. 12,017, of 1897, and entitled, "Improvements in the production of coatings or films, on glass and other articles or materials, and in apparatus therefor."

In conclusion, I would say that, in addition to the specimen prints referred to in the foregoing, it would afford me much pleasure to send a set of screens for your acceptance so soon as I have provided myself with glass of more suitable character, my experiments thus far having all been worked out with ordinary sheet glass, which, having minute

scratches occasioned by the straw packing used, the same become accentuated on etching, and so constitute blemishes.

Soliciting your kind inspection of the specimens, I am, yours, &c.,  
100, High street, Ilfracombe, June 27, 1899.  
J. WHEELER.

[We are very much obliged to Mr. Wheeler for his interesting letter and the specimens produced by his metzograph screens. The precise method adopted by Mr. Willatt in the preparation of his irregularly grained screens is unknown to us, but the results they yield differ from those sent by Mr. Wheeler. The latter have an exceedingly fine grain, whereas Mr. Willatt's results are comparatively coarse and "broad" in effect.—EDS.]

## THE PHOTOGRAPHIC SALON.

To the EDITORS.

GENTLEMEN,—I shall be much obliged if you will kindly intimate in the next issue of your valuable paper that applications for entry forms for the Photographic Salon should be addressed to me here, and not to the Dudley Gallery.—Thanking you in anticipation, I am yours, &c.,  
Camera Club, Charing Cross-road, W.C.  
June 30, 1899.  
REGINALD CRAIGIE.

## IN REPLY TO "FREE LANCE."

To the EDITORS.

GENTLEMEN,—I sincerely congratulate "Free Lance" upon the progress he has made since June 16. He is emerging from his archaic notions of art, and may some day produce a picture instead of a map.

Our knight errant must have been deeply disappointed to find his favourite Rozinante of no use as a racer. The necessities of the situation may account for his difficulty in distinguishing between the head and the tail of the animal.

If "Free Lance" will study the command a planar lens and a focal-plane shutter will give him in instantaneous photography, he will find that the remark I made is nearer the truth than he supposed.—I am, yours, &c.,  
July 3, 1899.  
P. EVERITT.

## A CORRECTION.

To the EDITORS.

GENTLEMEN,—In the report of the North Middlesex proceedings in your last issue are one or two inaccuracies.

The discussion was quite informal, and the reporter has credited me with some statements made probably by some one else, which is not surprising under the circumstances.

For instance, I am not responsible for the statement that false gradation would be introduced into a stripped and reversed negative, nor for the other statement that metal would stain in development.—I am, yours, &c.,  
J. MCINTOSH.

14, Lowman-road, Holloway, July 1, 1899.

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

## PHOTOGRAPHS REGISTERED:—

F. C. MacMahon, 23, Academy-street, Liverpool, N.B.—Photograph of (St. Mary's Lodge) Freemasons' group, Liverpool.

B. Pearce, Empire Studio, Machynlleth, County Montgomery.—Photograph of group of representatives of first Welsh Wesleyan Methodist Assembly.

"J. W. D."—Impossible for us to trace him.

A. G. BROPHY.—1. We are much obliged for your suggestions, which we will bear in mind. 2. F-11, approximately.

GLENBROOK.—If the photograph is copyright in Russia, it is, *ipso facto*, copyright here, and its reproduction is attended by the risk of an action for infringement.

BILTON.—1. Such a negative will do for the process. 2. The same as for the ordinary collotype process. 3. Yes; we have seen really good results produced by it.

COLOURING PHOTOGRAPHS.—F. DANKS writes for list of publications in reference to same, or short description of various ways of doing, &c., colours required, &c.—Messrs. Newmann & Co., 5, no square, publish a work on the subject.



**PATENT.—HERTS.** If the apparatus is patented, it would be illegal for you to make it. The mere fact that you made it yourself, and exclusively for your own use, makes no difference, you infringe the patent all the same.

**DRY FERROTYPED PLATES.—E. WILLIAMS** asks: "Will you kindly tell me the names and addresses of the makers of dry ferrotyped plates and oblige?"—In reply: These may be obtained of Fallowfield, 146, Charing Cross-road, W.C.

**W. H.** says: "Can you tell me if the improved Dixie vignetter can be obtained in England? The Scovill & Adams Company are the New York agents."—We think not. It would be necessary for you to order it through a dealer.

**METOL FOR VELOX.—AMATEUR** asks: "Can you tell me correct way to mix metol developer for Velox paper? I mixed all ingredients before and the result was failure."—Simply mix the developer according to the formula issued with the paper. If that is done, there will be no failure.

**ENAMELLING P.O.P.—GLOSSY** says: "I should esteem it a favour if you would give me a formula for producing a very highly glazed surface on P.O.P. prints (raised enamelled)."—See reply to "Brilliance." Attach one or more thicknesses of paper to the back of the print while on the glass and before it is dry.

**COPYRIGHT.—W. H.** says: "If I take a portrait of a person as an order, and he pays me for so many cabinets, can I, with his consent, copyright the photograph in my own name? I shall have his consent in writing."—In reply: In order that you should become possessed of the copyright, it should be assigned to you in proper legal form.

**TONING BATH WANTED.—R. A. BEEMAN** says: "Will you kindly inform me in your next issue of a good toning bath for sepia bromides developed with amidol?"—The method usually employed for sepia tones on bromide paper, whatever the developer, is the well-known uranium toning method. We know of no better for bromide prints.

**COPYRIGHT.—PERPLEXED** says: "I have just photographed a curiosity, for which I have made no charge. Can you inform me if I have any copyright in the portrait without having the same registered?"—In reply: The copyright is yours. You had better register the photograph. Our publishers will effect same for you if you will send them three prints and 1s. 7d. in stamps.

**THE FACTORY ACT.—APPRENTICE** says: "In our workshop there are five of us, two of that number apprentices. Does our place come under the Factory Act? I may state that we have only two holidays in the year, Christmas Day and the general holiday."—We should say that the workshop does come under the Factory Act, particularly if all the hands employed are "young people."

**MARKED PLATES.—D. STUART** sends us some prints from negatives made in a new camera which have a mark across them, and asks us to account for the defects. The negatives, he says, were made on —'s plates.—The marks are clearly due to emanations from the hinge fabric of the shutters of the dark slides. The remedy is to replace the present fabric with an inert material. This the camera-maker should do.

**STEREOSCOPIC CAMERA.—C. R. B.** says: "I am designing a stereoscopic camera I am going to have made. Will you please tell me if there is any necessity to have the lenses adjustable, or will a fixed distance of two and three-quarter inches suffice?"—We should prefer to have the lenses adjustable, say, from two and a half to three and a half inches apart, the latter distance for when there are no near objects in the foreground.

**VALUE OF COPYRIGHT.—AMATEUR.** We cannot assess the value of the copyright. As the firm want the photograph to reproduce for advertising purposes, they will, doubtless, pay a good price for it. Under the circumstances named, we should say they would pay ten guineas for the copyright—possibly more. We know that the same firm have paid higher sums than that for copyrights. Our advice is, Get as much as you can.

**ENAMELLING PRINTS.—BRILLIANCE** writes: "Kindly give brief directions for enamelling gelatine prints with collodion, and say if they will adhere to the collodion by reason of their own gelatine (unalumed), or require to be covered with adhesive?"—Thoroughly clean the glass, and then treat it with French chalk. Coat with collodion, and wash until all greasiness disappears, then squeegee the print upon it. With most papers that is all that is necessary. With some, however, it may be necessary to immerse the plate and the print in a dilute solution of gelatine before squeegeeing the print upon the collodion surface.

**PHOTOGRAPHY.—INTAGLIO** says: "Can you give me any information as to—(1st) the name, (2nd) the probable cost, and (3rd) number of copies per day of a steam, or other power, photogravure press, such as is used for the Rembrandt process? I have heard of one with an Italian-sounding name, but should be pleased to know where full information can be obtained about it."—If our correspondent refers to the Rembrandt Photographic Company, we cannot say. We believe the process is worked by the Company as a secret one, and no details of the method have been published. Possibly some reader will supply the desired information.

**ANAGLYPHS.—RELIEF** says: "In your issue of June 2 appeared a paragraph with reference to the anaglyph. I have for many years been greatly interested in stereoscopic photography, in which, of course, there is no patent or exclusive rights of production. I beg to ask whether you could, and would, kindly inform me whether there can be any exclusive right to produce views for the anaglyph, and to make the glasses? I am induced to put these queries to you by the last three sentences in your notice, particularly the last sentence, in which you remark, 'It is a pity more attention is not devoted to it in this country.'"—In reply: In our opinion, the production of anaglyphs and the glasses is open to any one.

**PAINTING BACKGROUNDS.—BACKGROUNDS** asks: "1. What materials are necessary for painting photographic backgrounds on brown paper, and where purchased? 2. Whether any knowledge besides drawing is required?"—1. Ordinary distemper colour. Size, whiting, lampblack, or other pigments. The distemper should be mixed warm, then allowed to become cold, and applied in the j-lled state. 2. Nothing beyond a little experience in laying on the distemper, which is easily acquired.

**CRACKED NEGATIVE.—P. R.** asks: "Could you oblige by telling me how to strip off film from the broken glass? The film is not broken at all. I cannot copy it because it cracked before I could get a print off, and cannot get them to set again."—First alum the negatives or treat it with formalin, wash, and then immerse in a diluted hydrofluoric acid—five or six minims per ounce of water. In a short time the film will leave the glass, and may then be washed in two or three changes of water. Have ready a glass plate that has been coated with a weak solution of gelatine and allowed to set, then float the film upon it, remove, and rear up to dry. It is needless to say that air bubbles must be avoided in the operation.

**COPYRIGHT.—H. C.** says: "Kindly permit me to put the following questions with reference to copyright. 1. Is it legal to copy photographs, which do not bear the mark 'copyright,' according to the old Copyright Act? 2. Would the new Act, if it comes into operation, prevent me from executing any orders for copies without the permission of the authors of the photographs? 3. Would the amendments of the new Act have a detrimental effect on firms whose style of business lies mainly in the production of black-and-whites and coloured enlargements, either from direct negatives or copies?"—In reply: 1. It is not legal. If the copyright is registered, the copyist runs the risk of an action. 2. Yes; but the new Act is not likely to come into force—at any rate this session. 3. The amendments would very seriously interfere with such a business.

**COPYRIGHT.—JOHN WICKENS** says: "A brother professional took a photograph of the late Tom Ellis, and only parted with three prints. No charge was made for the sitting, and about a week ago my friend found that the photograph had been reproduced by a firm of jam-manufacturers. Immediately after Mr. Ellis's death the negative was registered at the Stationers' Hall. The three prints were then out, and my friend can trace them all, but none of his had gone to the firm mentioned. He made a complaint to them, but they denied all liability, stating that the print they used was not stamped with the word 'registered,' or 'copyright.' Now, what I want you to answer is the two following questions: 1. If, by any chance, this firm should have secured a print prior to registration, is there any claim, bearing in mind there was nothing paid for the sitting? 2. Is it absolutely necessary to have the word copyright on the print when registration is effected?"—In reply: 1. In our opinion penalties and damages could be recovered. We advise you to make a claim. 2. No. The Act (you will find it in the ALMANAC for 1899) imposes no such rule or regulation. The firm of jam-manufacturers deserves to be smartly punished.

**A NOTICE TO QUIT.—CRIPPLE** asks: "1. Am I bound by the notice or answer to pay or get out? 2. Have I not a right to know who the new owner is? 3. If I cannot get out by the 29th, am I still bound by my agreement to stay until March? 4. Am I bound to pay the rent to the old landlord? You see, the man I rented the house of this last seven years has sold it, and I pay him the rent the same; the lady owner don't want to be known, but wants to get 2l. 10s. per year more. The one that sold it is acting for her, you will see by the notice: 'Notice.—I am requested by the owner of S. L. S. R. (which you now occupy) to inform you, and hereby please take notice, that after September 29, 1899, the rent of S. L. will be 22l. 10s. per year, payable upon the usual quarter days. If you do not agree to this, please let me know by giving notice as per agreement, viz., three months from the 24th inst. Should you not do so, I shall take it that you agree to pay the advanced rent.' 'Reply.—You may inform the lady owner of S. L. that I refuse to pay the advanced rent and accept her notice.'"—In reply: 1. It seems to us that by formally accepting the notice you must leave on September 29. 2. We think not, if the notice is given by the owner's solicitor, duly accredited. 3. By accepting the notice you will have to leave September 29. 4. Pay the rent to the one who let the premises to you, unless he gives you authority to pay it to some one else.

**STUDIO PHOTOGRAPHY.—DUFFER** says: "It is my intention to shortly open a studio in a small way, but wish to turn out high-class work. I shall be very grateful, therefore, if you will answer the following queries: 1. What kind of plate is most suitable, and whose make would you recommend? 2. What kind of paper is it that first-class photographers use that tones so beautifully? Where can I get it, and can you say the process adopted? 3. Is it imperative, to secure the very best results, to use a portrait lens, or will an R.R. by good maker be equally suitable? 4. Where can I get good mounts from in small quantities? 5. If requested, may I copy portraits for any one, mounting the copies on mounts bearing my name?"—In reply: 1, 2, 4. Consult our advertisement columns, as it is quite against our rule to recommend any particular manufacturer's goods. 3. No, only that portrait combinations are much quicker in action. 5. You may, of course, copy other people's work if it is not copyright. Whether you mount them on cards bearing your own name is a matter of taste. But, if you do so, representing that it is your own work, it would decidedly be immoral. We cannot help thinking that our correspondent's *nom-de-plume* is not ill-chosen if he thinks to start a high-class business, even in a small way, with the limited knowledge of photography he seems to possess. We should advise him to article himself to a first-class photographer for one or two years before attempting a high-class business.



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## EX CATHEDRÂ.

THERE are parts of Mr. Crooke's Presidential Address to the members of this week's Gloucester meeting of the Photographic Convention of the United Kingdom which deserve to be pondered by all classes of photographers; but we imagine that his professional brethren who have not had the advantage of listening to the address will turn with more curiosity and interest than any other class to the printed words in search of anything Mr. Crooke may have said that bears upon the position and future prospects of professional photography and its most important branch—portraiture. The foremost position Mr. Crooke has won for himself in the ranks of modern photographers invests anything he may say on this subject with the weight and respect which authority always commands, while the thoughtful and deliberative temperament conjoined to a high degree of artistic and æsthetic cultivation of which he is known to be the possessor add increased importance to the views which he lays before his fellow-photographers.

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THREE points stand out with the utmost clearness from Mr. Crooke's address. While, on the one hand, he does not ex-

pressly say that he foresees a declining future for portrait work of the commercial and show-case kind, on the other he is sanguine that for pictorial portraiture the public field is an ever-widening one. He tells us—and nobody in Great Britain should know better whether this is, or is not, so—that there is at present a marked appreciation of high-class pictorial portraiture, and that the men who produce it will be sought after. This is an observation which we ourselves have often made and commented upon, and we are pleased to find confirmation of it at Mr. Crooke's hands. The future hopes of pictorial portraiture rest on the efforts of such men as Crooke, Barnett, Baker, Hollyer, to bring home to the public the flexibility of photographic portraiture in responding to the touch of the photographer's own temperament and individuality on the one side, and of extracting from the sitter, on the other side, the many subtle shades of character which go to make up a personality. The "usual thing," to quote Mr. Robinson's classic phrase, will, doubtless, long hold a place in photographic productions, but it is to the higher or pictorial aspects of portraiture that we must look in the future for the salvation of a branch of the profession over which the tears of lamentation fall without ceasing.

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MR. CROOKE gives all photographers, no matter what class of work they produce, a practical hint of no inconsiderable value. He tells them to set their houses in order in the literal sense. So long as the photographer conducts his business after the style of the little tradesman, so long will the public rate him and his productions at no higher level than that upon which the wares and business methods of the grocer or the bootmaker may be placed. If at some of the more pretentious establishments there is far too much vulgar and gilded display, calculated to repel rather than to attract the patronage of cultured people, it is no less true that thousands of photographers' businesses all over the country are conducted in dingy shops and in loftily situated rooms, approached by narrow passages and staircases, which, in these days of increasing luxury and refinement of even commercial surroundings, demand a great deal of courage and self-sacrifice on the part of sitters, particularly ladies, to accept or to accustom themselves to. Mr. Crooke boldly says that the shop should be abolished, and that your earnest, artistic, or pictorial



photographer should practise his profession as other professional men do, in private-house surroundings. Among the foremost men in the profession this is done to some extent even now. While, however, we can scarcely look for a wholesale adoption of the idea amongst the rank and file of photographers, we yet perceive that, if the large majority of them would instal themselves in establishments which, in taste, style, and *mise-en-scène*, rejected the mean and often squalid appearances of the side shop and the dark passage decorated with forbidding specimens of inferior work, the public, instead of severely refraining from patronising photographers' studios, would, unquestionably, be attracted to them in rapidly increasing numbers. In the conduct and management of even a middle-class photographic business there is unlimited scope for the display of good taste in decorations, appointments, and furniture, and Mr. Crooke deserves well of his brethren for emphasising the point in the way he has done.

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A RECENT number of the *Journal of the Society of Arts* announces that the Albert Medal for the present year has been awarded by the President and Council to Sir William Crookes, F.R.S., for his extensive and laborious researches in chemistry and in physics; researches which have, in many instances, developed into useful practical applications in the arts and manufactures. Sir William Crookes was among the first to employ the spectroscope as an instrument of chemical research, and by its aid, in 1861, he discovered the metal thallium, the earliest of the series of the "rare metals." To his researches was also due the discovery of the various earths now so extensively employed in obtaining a large increase of light from illuminants. In 1872 he began the long series of experiments on radiation, of which the radiometer was the first outcome. This work on molecular physics in high vacua led to methods of producing extremely high vacua, which made possible the construction of the incandescent lamp. They also enabled the remarkable properties of the cathode rays (which are affording such important results in connexion with surgery) to be discovered and developed. He has rendered important services to industrial chemistry, and long ago established a position as an authority on the chemistry of dyeing and calico printing. His work in connexion with the chemistry of agriculture also requires to be noted. His services to pure science have been acknowledged by the award of a Royal medal, and of the Davy medal of the Royal Society; and it is the application of these researches to industrial uses which led the Council of the Society to submit his name to the President for the award of the Albert Medal.

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At the Convention this week Mr. Ward, of Messrs. Wellington & Ward, showed us a number of negatives on the new dry stripping film which his firm are shortly introducing. When the negative on its paper support has been removed from the ferrotype plate upon which, after development, it has been squeezeed, the point of a sharp-bladed knife is run along one of the shorter sides of the film. Sufficient pressure is applied to the knife to enable it to penetrate the film only, without cutting the paper beneath. The point of the knife is then introduced under the film to free the edges to the depth of about half an inch. This having been done, the corner of the film is taken between the fingers, and it can then be readily peeled from the paper support. The whole thing is accom-

plished, with a very little practice, in a few seconds. It can easily be seen that such a system of making pellicular negatives has very great advantages to recommend it to photographers.

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WE were sorry to learn, on Monday last, that on his arrival at Gloucester Mr. R. Child Bayley, editor of *Photography*, met with an accident by a fall from his bicycle. The result was a breakage of the leg above the ankle, necessitating Mr. Bayley's instant removal to the infirmary, of which he is likely to be an inmate for a week or two. The accident occurred within a few yards of headquarters. We are sure that our readers will join us in an expression of sympathy with Mr. Bayley in this peculiarly distressing accident, occurring as it did on the opening day of the Convocation, in which he was down to take a prominent part. We sincerely wish him a speedy recovery.

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THE latest, and certainly an original, form of photographic piracy has been brought to our notice by Sir Henry Trueman Wood. It was discovered in operation in the meeting room of the Society of Arts a few nights ago. It appears that on the occasion of a lecture, which was illustrated by lantern slides of a diagrammatic character, Mr. George Davenport, the well-known lantern expert, who is responsible for the working of the very fine projection system at the Society, heard the click of a shutter release proceeding from the auditorium. Inquiry revealed the fact that a gentleman who had come for the purpose of hearing an important illustrated lecture on a scientific subject had provided himself with a hand camera, with which, by means of time exposures (the instrument, of course, being supported to allow of several seconds being given), he was photographing the diagrams that were being shown on the screen.

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UPON being requested to do so, he stopped taking these "photographs in the dark." Sir Henry Wood tells us that he was not present at the time, otherwise the photographer in question would not have got off so easily. In the case under notice, it is to be presumed that the motive actuating the surreptitious photographing of the lantern picture was the desire to obtain copies of a set of engineers' drawings before they were published. We have considerable contempt for the vulgar pirate who copies photographs or pictures in which he holds no rights, but a great deal more for the man who can allow himself to commit the offence of making the occasion of a scientific lecture the opportunity of directing a hand camera to the use of appropriating a lecturer's original drawings. Possibly this description of the newest form of photographic piracy may put lantern lecturers on their guard against allowing valuable pictures to remain on the screen long enough to be copied.

#### SHELLAC IN PHOTOGRAPHIC TECHNIQS.

FOR some reason unexplained, if, indeed, explainable, this substance, one of most extensive employment in the arts generally, and in photography in particular, is the subject of such misrepresentation, such erroneous description, such misleading instructions, as almost to approach the mysterious. Let us, for example, turn to that monumental example of patience, industry, and, usually, of scientific precision, *Watt's Dictionary of Chemistry*, under the heading of "lac" (incidentally we



may observe that the word lac itself has a specific application to the dye-stuff, while the resin is commonly known with a qualifying addition—thus, shellac, stick lac, seed lac, button lac, white lac, the former, again, being described, according to its colour, as orange lac, garnet lac, &c.).

We read, referring to stick lac: "These twigs are called stick lac. The lac is removed by melting and squeezing through canvas, when the hardened drops are known as seed lac. After bleaching by chlorine or charcoal, and making into sticks, it is known as shell-lac or shellac." As a matter of fact, shellac means lac in the form of shells or scales, not sticks; it does not require to be bleached to earn the name; it is not bleached by charcoal; seed lac is not the melted drops of lac exuded from the canvas. This, it will be admitted, is a fair crop of errors to be found in half a dozen lines of scientific description; but that work is by no means the only one that sins in this connexion. One of the cherished fables of photographic recipes is, that if we dissolve shellac in spirit, and shake it up with charcoal, it becomes decolourised. We can only say that we have tried the plan with many samples of shellac, using both vegetable charcoal and freshly burned animal charcoal, and the result has been just the same as if we had read a page of Bradshaw to it. Again, we are told in many places that, if we expose it to sunlight, decolourisation takes place. We have placed narrow phials full of varnish, for six months, in a window with a south light, and we have been unable to detect the slightest alteration of colour. Possibly, if we had employed a spectroscope, we might have detected a change, but the colour of a varnish is not usually tested in that manner for commercial purposes.

Dealing now with the practical aspects of our subject, we meet at the outset one particular disadvantage in the manufacture of shellac varnish, the staple basis of all the best photographic varnishes; we refer to the great wastefulness that cannot be avoided when the lac is dissolved in methylated spirit. A very large volume of the liquid becomes useless, owing to the presence of a flocculent precipitate that never dissolves, and, even after months of standing, will not settle into a small bulk, and, moreover, will not satisfactorily filter out. It soon clogs a filter, and, consequently, very little of the thick part of the varnish can be saved that way. This thickened liquid may, however, be used with advantage, with a further quantity of shellac added, as a varnish for woodwork—printing frames, dishes for holding liquids, and so on. It has often been stated that the liquid can be cleared and the precipitate compacted by adding such substances as plaster of Paris, &c. We may say that our own experience has been quite unsatisfactory with all or any of these methods. We consider there is most promise in a suggestion of Mr. Watmough Webster, that the precipitate might be reduced in bulk by placing the crude lac solution in a centrifugal machine.

Ordinary white lac is especially liable to this waste; but the fresher the lac the smaller the waste. If used when too old, we have seen the solution remain without any perceptible clearing for months after the soluble portion has been taken up.

Aqueous solutions of shellac subserve a variety of uses, they are used for varnishing negatives by simple immersion while the film is still wet; when put up to dry and drain, they dry as soon as under ordinary conditions and are then ready-varnished. Aqueous lac solution has been used for rendering paper impervious to water for the autotype process, but it has the defect of becoming discoloured by age. The

modes of making aqueous solutions are many and various. The plan adopted in some trades, the hatter's for instance, of dissolving in a boiling solution of borax, is not suitable for photographic purposes. When small quantities only are needed, the best plan is to add a few drops of strong ammonia solution to, say, an ounce of varnish, the varnish so treated will mix with water in any proportion without precipitation. When required in quantity, the shellac may be soaked for some time in a solution of carbonate of soda or carbonate of ammonia, it is then soluble in boiling water. For a useful, strong, hard light-coloured varnish, a mixture of two parts of best orange shellac and one of fresh white lac makes a varnish difficult to surpass. The addition of gum sandarac or benzoin is often recommended; the addition heightens the brilliant glossiness of the surface, but renders the varnish less tough and less able to resist ordinary wear and tear.

There is still room for the publication of a really good method of making shellac varnish, or a way of treating shellac that will render it soluble, or at any rate do away with waste in its making. As an aid in experimenting, it may be useful to know the chemical composition of lac, and we will conclude our remarks by quoting from a paper by Herren Schirch and Farmer, which gives it as follows: Wax, 6; colouring matter, 6.5; purified resin, 74.5 (of which sixty-five per cent. is soluble, the remainder insoluble in ether); residue, 9; and water, &c., 3.5 per cent.

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**Photography as a Profession.**—On several occasions when alluding to the over-stocked photographic labour market and the small salaries paid, we have mentioned that any trade or calling which is easily acquired is sure to have a superabundance of labourers. So it is with photography. Some very strange ideas prevail with regard to the knowledge necessary to commence professional photography, but nothing stranger has come under our notice than the queries put by a correspondent, and replied to last week. He says he wishes to start a *high-class* business in a small way (the italics are his). He then asks what plates to use, what paper, and how to produce the same beautiful tones that professionals get, where to buy mounts, whether a rapid rectilinear lens is as good as a portrait one, &c. Most of our readers will be amused that any one should entertain the notion of starting a business—let alone a high-class one—who has to put such questions as the above to us. The *nom-de-plume* he has selected for the answer to appear under, some will think was not ill-chosen by one who thinks of commencing a business with such a limited knowledge of its requirements.

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**Persecuted by Photography.**—The ubiquitous photographer seems to be as prevalent and as persistent in France as he is in England. We are told by the special correspondent of the *Standard* that Madame Dreyfus and her relatives are being much persecuted by photographers, who endeavour to catch her in every possible position as she passes to and from the prison at Rennes, where her unfortunate husband is at present confined. The correspondent, in writing, says that, the day before, an enterprising firm had installed a cinematograph apparatus in the vicinity of the prison to take pictures of the lady's departure, and adds, M. Havel, endeavoured to protect her from this annoyance, and the films were probably spoilt. Let us hope they were. To be snap-shotted against one's will by hand cameras is bad enough, but being cinematographed is infinitely worse. Hand-camera pictures, as a rule, are principally confined to private collections. Not so, however, with cinematographs, they are taken for exhibition at places of public entertainment. Madame Dreyfus has our sympathy.



**The Dismal Photograph.**—Mr. Lethaby, Inspector of Technical Instruction and Art Classes under the London County Council, is evidently no great admirer of photography; for, in a paper read last week before the Women's International Congress on the "Special Aptitude of Women for Handicrafts," he is reported to have said with regard to drawing: "Then the portrait. It is absurd that, with such a host trained as painters, there should be no practical mean between the 100 and 1000 guinea oil and the dismal photograph." He then proceeds to ask, "Why might not some girl who could draw do a two hours' portrait in pencil for a guinea?" At this there was applause. So far as we can see, there is no reason why she should not, for the work would certainly be remunerative, if—and there is the "if"—she could get commissions for them. At present, we suspect that the public will prefer a dozen or more "dismal photographs" for their guinea than one two hours' pencil portrait. However, art training amongst girls should be encouraged, though it may be unwise to hold out hopes to the students that are not likely to be realised.

**Royal Arms Prosecutions.**—Some photographers who use the Royal Arms on their show-cases, bill-heads, circulars, &c., do not appear to be aware that they are breaking the law and subjecting themselves to heavy penalties. On Tuesday, last week, a hatter, in the Strand, was proceeded against at Bow-street Police Court for using the Royal Arms without holding the Royal Warrant entitling him to do so. He was mulcted in a penalty of ten pounds and three guineas costs. Two others were also fined smaller amounts for similar offences, and on Tuesday an undertaker in the Euston-road was prosecuted, at the Clerkenwell Police Court, for a like offence. For this defendant it was pleaded that he thought he had the right to use the Royal Arms as they had been exhibited over his premises for forty years. In this case the magistrate inflicted a fine of ten pounds with three guineas costs. The magistrate remarked, during the hearing of the case, that the maximum penalty was fifty pounds. It is a very common idea that, if any one supplies anything to the Queen or others of the Royal Family, they are forthwith entitled to use the Royal Arms, and they have done so. It is a fallacy, however, and is an offence against the law. To use the Royal Arms, a warrant to do so must first be obtained. We call attention to this subject, because we suspect that some are ignorant of the fact that supplying photographs to members of the Royal Family, or to the Queen herself, does not entitle them to use the Royal Arms or any colourable imitation thereof.

**The Decoration of the Royal Exchange.**—One day last week another of the mural paintings that are to embellish the Royal Exchange was unveiled, the ceremony being performed by the wife of the Master of the Mercers' Company. The painting is by Mr. Ernest Crofts, and represents the opening of the building in 1571 by Queen Elizabeth. This picture is a valuable addition to the historic gallery which is gradually filling the panels of the Royal Exchange. When all are finished, the Exchange will possess one of the finest galleries of historical pictures, by modern artists, in this country. Of course, all the pictures are painted according to the imaginations of the artists, assisted by such paintings and drawings of the periods that are available—and they are not many. Probably, had photography been in existence in 1571, it would have depicted the opening ceremony by Queen Elizabeth somewhat differently from that represented by Mr. Crofts, though it is doubtful if it would have been better pictorially.

**Antarctic Exploration.**—Some little time back we mentioned that the Royal Society, together with the Royal Geographical Society, had approached the Government with regard to assistance in fitting out an expedition to explore the Antarctic regions. At that time the Government did not see its way clear, though sympathising with the object, to give the desired assistance. However, the Lords of the Treasury, in a letter last week to Lord Lister, the President of the Royal Society, say that they are prepared to ask Parliament for grants amounting to 45,000*l.* towards the expenses

provided the Royal Society and the other promoters are able to assure a like sum so as to enable the scheme to be efficiently carried out. Although the northern regions have for many years past received much attention, the southern have been almost entirely neglected. Now there is a prospect that there will be an expedition to the Antarctic regions, and it is needless to say, that photography will take an important place in it.

## PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

GLOUCESTER MEETING, JULY 10-15.

For the fifth time in its history the Photographic Convention of the United Kingdom meets in a western city, Bath, Chester, Shrewsbury, Plymouth having been the scenes of former gatherings. It would seem from this that the members have a preference for holding the Convention meetings at places having the quiet characteristics of a cathedral town. Experience has shown that in large cities like London and Glasgow there is a lack of cohesion amongst the members during the Convention week. The "magnificent distances" that separate the various points about which Convention interests centre during the week not only keep the members a great deal apart but over-fatigue them, and thus rob them of the opportunity of doing the fullest justice to the programme provided.

But in a town like Gloucester, with its forty odd thousand inhabitants, only and its one dominating attraction of the cathedral, past the very doors of which the human tide daily ebbs and flows in the very centre of the town, a trumpet call might easily bring all the members together.

The Guildhall, the official meeting-place, is perhaps one minute's walk from headquarters, which, in its turn, is no more than a stone's throw from the other hotels and private houses at which members have been staying during the week. Thus the feeling of being quartered near to one another is a valuable factor of estimating the amount of success which may be expected at any particular meeting of the Convention.

Upon the architectural and archaeological attractions of Gloucester as a photographic rendezvous it is needless for us to dwell; this was done with admirable point and detail by Mr. Medland in the official guide-book. Rather let us say that, by historical interest and picturesque surroundings, no more agreeable scene for the Convention meetings could have been chosen than this placid western city.

It is the fourteenth annual meeting of the Convention. The hand of illness and other causes have kept such old supporters as John Stuart and A. L. Henderson away from the busy scene of photographic talk and work; but, in the persons of Mr. George Mason, of Glasgow and Mr. Alexander Tate, of Belfast, the link with the past remains unbroken, and the continuity of Convention traditions has been maintained. We should be extremely sorry to see the Convention robbed of that tradition. It gives opportunity once a year for all sorts and conditions of photographers to meet on the common level of devotion to a fascinating branch of "fine art," as the Act of 1862 graciously permits photography to be termed.

The scientific, practical, artistic, commercial, professional, and amateur aspects of photography are the subjects upon which ideas are freely exchanged during the week, and we can speak from personal observation when we say that a Convention meeting forms a radiating point whence photographic knowledge is transmitted to many points, near and far.

One of the great charms of the Convention is the opportunity it gives for the display of good fellowship. It is informal; it is conducted by photographers, for photographers, and without the outside assistance of social or aristocratic favour. There are some persons who would like to see this annual gathering of photographers turned into a "function" which it would be the "correct thing" for local society to patronise and "do." We gravely doubt whether, on the one hand, photographers would tolerate being taken by the hand in this manner, or, on the other, whether county magnates and aristocrats could be induced to feel sufficient interest in the proceedings of a peripatetic institution which in the nature of things cannot be expected to take rank with the British Association and other gatherings of the kind to which the intellect of the world annually turns.

Fine weather ushered in the week, and the old familiar scene again presented itself to us: the gathering on the Monday morning of troops of members, who had not met since last year at Glasgow. Many old faces, as we have hinted, were missing, but each meeting of the Convention always sees a batch of new members to take the place of those who are compelled to be absent.



## THE EXHIBITION.

The feature to which Convention visitors turn at the earliest moment is the usual exhibition of apparatus and photographs. It is held this year in the large hall of the Guildhall an apartment eighty feet by forty feet. It cannot be said that the pictorial part of the exhibition compares favourably with the displays given at Glasgow, Great Yarmouth, and Leeds. Indeed, but for the efforts of the Platinotype Company, there would have been little of the highest class of work to be seen. This Company sends about forty reproductions of well-known pictures in platinum. They are framed in plain, flat wooden frames coated with a grey pigment of a light tint, and are hung on dark green cloth under the gallery. The lighting is unavoidably imperfect, but the selection of pictures gives the visitor a good idea of the capabilities of this process for translating paintings into monochrome.

Kodak, Limited, occupy nearly the whole of one wall space with a large stand, whereon one sees set forth examples of all the productions of the Company in the way of apparatus and printing papers. Messrs. W. Watson & Sons, of 313, High Holborn, are represented by a typical selection of the apparatus they manufacture, prominent on the stall being the Acme camera, the new binocular stereoscopic camera, and the Ives Kromskop, which attracts the delighted attention of visitors. Messrs. Wallis Brothers, of Kettering, show their roller-blind shutter. The Tella Camera Company occupy a stand. By the aid of a glass-sided camera Mr. W. E. Dunmore, the Managing Director of the Company, illustrates, for the enlightenment of visitors, the ingenious mechanism of one of the most novel and beautiful hand cameras that have recently been introduced. Messrs. Burroughs, Wellcome, & Co., send a large glass-covered case filled with tabloids of their manufacture for photographic use. Lenses and cameras are shown by Messrs. Ross, Limited. The principal movements of the Sanderson camera have been applied to a hand camera, and this, among other apparatus, was demonstrated at Messrs. George Houghton & Sons' stall by Mr. Sanderson, the inventor. Secco film was demonstrated by Mr. J. H. Avery. A series of prints from negatives by Mr. Sandell, contributed by the Sandell Plates and Film Company, illustrate the capabilities of those plates for producing results free from halation, &c. Cinematographic apparatus formed Mr. R. W. Paul's exhibit, and the Velox papers also figured on one of the stalls, Messrs. Griffin having arranged for the paper to be practically demonstrated. Mr. H. Snowden Ward sent a collection of colour prints which are hung on the wall spaces surrounding the platform.

Local work is represented by a numerous exhibit from the Gloucestershire Photographic Society. The architectural work of Mr. W. C. Beetham and Mr. H. B. Milner is of special excellence, and among the exhibits there are some very good landscape studies. Among local professionals, Mr. H. W. Watson and Mr. E. Debenham send pleasing examples of work, the latter gentleman contributing an enlarged portrait of his well-known brother, "W. E." of that ilk.

On the whole, visitors find a great deal in the Exhibition to interest them, our references showing that many of the latest productions in photography were placed on view for their inspection.

## THE EXECUTIVE.

The Executive Committee of the Convention consisted of Messrs. H. Medland (Chairman), Oscar C. Clark, M.B., H. S. Crump, R. W. Dugdale (Local Hon. Secretary), W. Hodges, L.R.C.P.

The Local Committee was as follows:—Dr. Campbell, Messrs. James Clarke, Oscar Clark, Rev. Travers Clark, Messrs. J. H. Collett, J. M. Collett, H. S. Crump, C. H. Dancey, F. Fielding, J. Hole, E. A. Ind, S. G. Jones, H. Knowles, E. Lea, E. Mansfield, H. G. Madan, H. Medland, E. J. Neinenger, A. H. Pitcher, Herbert Sessions, A. Simpson, A. Slater, J. Tibbitts, F. A. Trotman, W. E. Vinson, Dr. Watters, Messrs. T. H. Washbourne, H. W. Watson, Geo. Whitcombe, W. B. Wood, G. Embrey, and W. Walwin.

Bath Photographic Society.—Surgeon Major Adcock, M.D., and Mr. G. F. Powell.

Herefordshire Photographic Society.—Messrs. Gus Edwards and Cecil Gethen.

The Hon. Local Secretary was Mr. R. W. Dugdale, 25, Kingsholm-road, Gloucester, and the latter gentleman, with Mr. Crump and Mr. F. A. Bridge, the General Hon. Secretary, were most assiduous in attending to the wants of visitors to the Convention—no light task, when it is considered what a multitude of detail work has to be taken in hand during the week.

On Monday afternoon a party of between sixty and seventy undertook the excursion, by brake, to Elmore, Fretherne, and Frampton-on-Severn.

The weather was inclined to be showery. The Cathedral, the picturesque old inns, and some other architectural antiquities of the city also supplied many opportunities for photographic work.

## THE CONVERSAZIONE.

On Monday evening the *Conversazione* was held in the Guildhall, the members being received by the Mayor, the City High Sheriff, and the Corporation of Gloucester. Music was provided, and refreshments were served during an interval in the proceedings. In our experiences of Convention *conversazioni* we have not seen a larger or more representative gathering of members. In addition to the civic party, which appeared in full state, many of the most prominent citizens of Gloucester attended the ceremony, and the scene in the roomy Guildhall was an animated and brilliant one throughout the evening.

In some quarters recently there appears to have been promulgated a fantastic notion that the absence of some half-dozen gentlemen from this year's Convention would be fatal to its success as a numerous and representative gathering. The best, and indeed the only, answer called for by the amusing lamentations in question, is a list of a few of those present at Monday evening's function, which we here append:—

The Mayor and Mayoress of Gloucester, the City High Sheriff, the Town Clerk, the Mayor of Cheltenham, Mr. William Crooke (President), Mr. H. P. Robinson and Mrs. Robinson, Mr. and Mrs. George Mason, Mr. C. H. Bothamley, Mr. F. A. Bridge, Mr. R. H. Dugdale, Dr. Hodges, Mr. and Mrs. Snowden Ward, Mr. E. J. Wall, Mr. Thomas Bedding, Mr. A. Horsley Hinton, Mr. A. Lindsay Miller, Mr. Godfrey Bingley, Mr. Harold Baker, Mr. J. W. Furniss, Mr. Allen Nield, Mr. C. Phipps Lucas, Mr. E. J. Humphery, Mr. H. Vivian Hyde, Mr. William Taylor, Mr. C. G. Emery, Mr. H. Walter Barnett, Mr. T. C. Turner, Mr. Frank Turner, Mr. W. E. Dunmore, Mr. G. M. and Mrs. Bishop, Mr. F. W. Hindley, Mr. Hirst, Mr. E. Peake, Mr. J. T. Sandell, Mr. and Mrs. A. Priestley, Mr. W. H. Smith, Mr. W. J. Croall, Mr. G. Fowler Jones, Mr. and Mrs. De'Ath, Dr. and Mrs. Adcock, Mr. H. R. Milner, Rev. E. T. Clark, Mr. F. H. Burr, Mr. G. W. Watson, Mr. S. H. Fry, Rev. T. and Mrs. Perkins, Mr. W. M. Harrison, Mr. W. D. Welford, Professor Stebbing (Paris), Mr. Alfred Watkins, Mr. B. W. Robinson, Mr. A. Clout, Mr. E. J. Appleby, Mr. S. B. Webber, Mr. J. L. Lyell, Mr. E. Debenham, Mr. Washington Teasdale, Mr. Charles Winter, Mr. T. A. Scotton, Mr. J. M. Dickinson, Mr. J. Lawley, Mr. Wilfred Emery, Mr. W. W. Nauntou, Captain Adair, Major Lysaght, Mr. G. Watmough Webster, and some three hundred other ladies and gentlemen whose names it was impossible to obtain.

The Mayor, having taken the chair, extended a cordial welcome to the Convention, remarking that Gloucester was always pleased to welcome such bodies. No branch of art had made such progress in recent years as photography. He wished the members of the Convention fine weather to enjoy the scenery of what he considered to be the most beautiful county in England.

Mr. C. H. Bothamley moved a vote of thanks to the Mayor and Corporation of Gloucester for their welcome, expressing regret at the unavoidable absence of the retiring President, Mr. John Stuart, through illness, he introduced the new President (Mr. William Crooke), of whom the speaker remarked that his admirable work had made his name known wherever photography was practised. Mr. Crooke did not talk or write about "art," but did it.

The President then took the chair, amidst loud applause, and read his opening address.

## PRESIDENT'S ADDRESS.

In opening this, the fourteenth meeting of the Photographic Convention of the United Kingdom, I might call your attention to a statement, contained in the useful little pamphlet issued prior to the Convention, that the first meeting was held in Derby in 1886. The number attending on that occasion is frankly stated as forty-six. It must be very gratifying to the originators of this reunion of photographers (many of whom are in our midst to-night) to watch its steady growth from year to year, showing how the facilities afforded by it for interchange of ideas and cultivation of lasting friendships are appreciated. In the increasing number who take advantage of the opportunity for a shake of the hand, we see evidence of the *bonne camaraderie* existing among the brethren of the black art. I can vouch from personal experience for the pleasant memories left by the Convention week on many previous occasions.

## COPYRIGHT.

Let me at once touch on one or two matters which I know are sure to be uppermost in your minds as photographers. Since the last meeting of this Convention, as most of you are aware, a Copyright Bill has been



brought before the House of Lords by Lord Monkswell. This Bill demands particular attention, as it is a measure which directly affects the interests of all photographers, amateur as well as professional. The existing Act of 1862 has been found to work very satisfactorily, and it is impossible to discover any reason for seeking to alter or modify it. However, our friends, the artists, for some not very obvious reason, are asking Parliament to deny photography the legislative rank and privileges of a fine art. They want to reduce the term of photographic copyright to thirty years, make registration compulsory, and render impossible the continuance of the present amicable relations between photography and the illustrated press. There is not the slightest chance of the Bill passing into law this session, but it is satisfactory to know that the Copyright Union and the Royal Photographic Society have been instrumental in placing before the Select Committee of the House of Lords the grave injustice proposed to be done to copyright in photography. It is probable that these efforts will not be thrown away, and that, should the Bill be reintroduced next session, it will be considerably modified. But it behoves photographers to be watchful, lest an unmodified Bill should again be promoted by the artists, who are seeking to injure and degrade photography at a time when, compared with thirty-seven years ago, its pictorial, technical, and scientific excellences never stood higher. The proposed Bill would disturb an art and dislocate an industry, while it would not advantage the artist, so that we must assume some unreasoning jealousy to be at the bottom of the agitation.

#### THE PROTECTION OF THE PUBLIC.

While on the question of legislation I might venture to prophesy that some steps will be considered desirable, if not necessary, for the protection of the public from the ubiquitous snap-shotter. Some weeks ago a daily paper, in giving an account of the amateur golf championship, wound up with the remark that, "though cameras were plentiful, their manipulators were not so aggressive as on former occasions;" this hints at the followers of our art having a reputation for misbehaviour. One might sometimes attribute their eagerness to enthusiasm, but the laws of discipline and etiquette should not be ignored, the dignity of the profession ought to be upheld, and nothing should be registered calculated to give offence to any one. In fact, obey the golden rule, "Do unto others as you would have others do to you," and so stave off the evil day when your camera will be taxed, and yourself be adorned in the fashion of the street porter with your registered number on sleeve badge.

#### INDUSTRIAL PROGRESS.

Photography, as a scientific and artistic pursuit, has gained more followers than any other discovery of the age, and as a consequence the demand for apparatus and material has been very great, and we owe a debt of gratitude to the manufacturers for the zealous and conscientious manner in which they have looked after our every want. You will say with me that it is perfectly astounding, considering the vast quantity of plates and paper coated in the course of a year, what a small proportion of waste is caused by faulty manufacture compared with that of some years back. Every article being so reliable and uniform reduces our anxieties in respect to the technical part of our work to a minimum. It will be impossible for me in the time at our disposal to-night to give any idea of the progress made in photographic manufactures during the year, but I might mention that I have had the pleasure of using recently the Cadett & Neall spectrum plate. When used in conjunction with their light-filter the effect is charming, and will revolutionise landscape in the matter of tone values and colour luminosities. Of papers, platinotype still holds premier position; "Dekko" and "Velox" have proved a great boon, but up north with us carbon seems to be greatly in vogue. You may have heard of the boy who, being catechised as to why he was a Protestant, replied, "Because my father was one." Now I fear many photographers can give no better reason for the faith that is in them; they copy their neighbours and, though imitation is said to be the sincerest flattery, we experience disgust when a man's style is copied in its integrity, and amusement when copied in part, making the plagiarist's picture a thing of patchwork.

#### THE OLD AND THE NEW STYLES OF PORTRAITURE.

But, with all the facilities at our disposal, have we been utilising them for the furtherance of the art side of photography or "pictorial photography" as it is now called? On looking round our leading exhibitions, it is quite apparent to the most obtuse observer that the title "pictorial" applies more frequently to landscapes than to portraits.

A vast army of intelligent and artistic workers has brought its skill to bear upon the production of pictorial landscapes, and, being unfettered by

the tastes or fancies of others, the results of its labours that adorn our exhibitions are worthy in every sense of being styled "works of art."

Of portraiture I cannot speak so encouragingly, for the past few years it has almost been threatened with extinction from our pictorial exhibitions. If we go back to the shows at the beginning of the eighties, we find the commercial portrait occupying the lion's share of space; but gradually matters have changed, and now the Royal Photographic Society is inclined to think the commercial, or technically perfect, portrait should receive more consideration at its hands than of late years. I am not sure that this type of portrait needs such kindly consideration. The producers of it have enjoyed the biggest share of public patronage, and had a good laugh up their sleeve, at the expense of those struggling with pictorial work, while they amassed great fortunes. I am of the belief that a change is approaching which will render this step on the part of the Society unnecessary. The spread of photographic knowledge tinged with artistic taste is such, that only the work in which is embodied artistic treatment, combining the individuality of the subject with the mode of expression peculiar to the author, will ever make our exhibitions interesting and educational.

#### PICTORIAL PHOTOGRAPHY.

As one interested in pictorial photography, I feel my mission here would be unfulfilled did I not refer more particularly to this branch. Modern photography requires to be executed on entirely different lines to those of former days, but it is to be feared that too many, through inability or carelessness, keep on in the old groove, ignoring the spread of knowledge and enlightened judgment now brought to bear on the results of their labours, and finding consequently a decrease in number of commissions and difficulty in getting the fees they demand. With reference to one cause of failure, is it not due to the striving after effect, the inborn anxiety to make something out of nothing, which results often in making nothing out of what might have been something, for we must remember that our art has its limits, which, once passed, reveal its weakness? Let us rather endeavour to cultivate a taste for simplicity, repose, and dignity, depending little on those gorgeous accessories deemed indispensable by some.

I now address myself more directly to those who have, as it were, been standing by for years, looking on at the ordinary game played by the largest establishments in the world, and I hope to-night to instil into the hearts of these patient bystanders (who have been striving to bring about the desired advent) a lively belief in the assured future of pictorial portraiture. The germ of pictorial photography has not been dead all these years, but we must confess that it has been barely kept alive; the root, however, is still with us, and, granted a little nurture from a generous public, will spring forth into glorious life. There is a marked appreciation of high-class pictorial portraiture, and the men who can produce it will be sought after. The individual specialist himself must have so many qualifications that it is difficult to get them all combined in one individual, one being more successful with the gentler, another with the sterner sex, and yet another with children; in fact, a distinct aptitude for one of the three manifests itself. Be this as it may, portraiture should be a separate branch and the men who practise it artists; then the status of the photographer will rise, and the work that is devoid of artistic merit must in due course be assigned to the mechanical section at our exhibitions.

Might I crave the indulgence of those present who are not interested in this particular, while I presume to suggest what I consider the most suitable method of handling our environments at this turn of the tide? As a man is judged by the company he keeps, so may he also be judged by his surroundings. This impression starts at the very entrance door; if this is vulgar, you may look in vain for refinement within. If specimens of work be exhibited here, let quality, not quantity, be the motto, and this feeling should govern the whole establishment.

The present-day tendency is towards too much display, giving a commercial aspect which is not at all desirable or necessary, we want to see more of the æsthetic element asserting itself. My ideal photographer's "shop" is a private house with closed door. This, you argue, precludes our being heard of; but are we not privileged to affix our name to each individual effort? Not like my tailor who made this exquisitely fitting suit, and who is debarred from printing his name on the tails. You have your advertisement free of charge, and, there being always some congenial souls on the outlook for artistic work, they will find their way to your bell handle.

#### LENSES.

Here let me make a suggestion to opticians who have been at work so long calculating optically perfect lenses for the profession. One welcome



addition for portraitists would be a lens for studio work that would in some respects resemble the Berghem in diffusion of focus (too much focussing would be undesirable), but having sufficient depth to enable focussing to be done roughly, say, by measurement, in the studio, similar to that practised in outdoor snap-shooting. This would rectify the absurd method of making a focussing stock of your model. To talk of diffusion of focus is tantamount to waving the proverbial red rag. However, as a middleman, it is not inconsistent for me to wave it, as it might be on the part of some of my extremist brethren.

#### COLOUR PHOTOGRAPHY.

The progress of colour photography makes the most fascinating topic, especially when its wonders are explained in the public press. False reports, such as Mr. Muggins, Ecclefechan, has, after long and persistent labour, at last succeeded in giving to the world nature in all her various tints. This is the sort of thing we get from time to time. That progress is being made there is not the least doubt, but whether we shall derive all the pleasure we anticipate when it is *un fait accompli* is another question. I regret to express myself in this pessimistic manner, but individual taste is bound to assert itself disagreeably at times, and, if we can be vulgar in monochrome, our opportunities so to distinguish ourselves will be unlimited in colour. I shall leave the scientific aspect of this question to a more able exponent, my friend Mr. Child Bayley.

And now in my closing sentence let me echo Lord Charles Beresford when speaking of his book, *The Breaking up of China*, "I'm glad it's done; I'd rather fight a general action than write another book. You know I'm not a literary man."

At the conclusion of the President's address Mr. Alexander Tate moved a vote of thanks to Mr. Crooke, which, having been seconded, was warmly carried. On the proposition of Mr. F. A. Bridge (General Hon. Secretary), seconded by Mr. B. W. Dugdale (Local Hon. Secretary), a vote of thanks was passed to the Mayor and Corporation for all the trouble that had been taken to render the visit of the Convention a success. The hearty applause which greeted this proposition was an expression of the feeling, animating the whole of the Convention, that the civic authorities and local executive committee had spared no effort or trouble to make the visitors' stay a pleasant and happy one.

A delightful evening terminated with an exhibition of colour photographs, according to the methods of Ives, Lumière, Lippmann, and Joly. Mr. R. B. Beard and Mr. E. J. Wall worked the lantern, and Mr. H. Snowden Ward, in the regretted absence of Mr. Child Bayley (who is progressing favourably) described the pictures.

On Tuesday morning, in perfect weather, a very large party left for the excursion to Berkeley Castle. Owing to the fact that large numbers of members omitted to sign the attendance book, we are unable to give an idea of the numerical strength of the Gloucester Convention; but, at a guess, we should say that there must have been between 300 and 400 members present during the week, a larger proportion than usual being professional men.

At the Annual General Meeting, held on Wednesday morning, it was decided that the Convention should visit Newcastle-on-Tyne next year.

For the convenience of Convention visitors, Messrs. Marion & Co., of Soho-square, W., have arranged to have a large display of photographic apparatus and sundries, drawn from their unique stock, on view at the New Inn, where a large room is occupied for the purpose. The "show-room" is in charge of Mr. J. M. Dickinson, the able representative of the firm, and its contents ranged in variety and extent from a studio camera to a midget mount. It will be open to the inspection of visitors on Friday and Saturday, and is well worth a visit.

#### AMMONIUM PERSULPHATE.

The peculiarities of this substance continue to excite much interest in the foreign photographic press. In Dr. Liesegang's publication, *Der Amateur Photograph*, Hehlheim points out that various samples have been found to differ in their action, some behaving admirably, whilst others have no reducing power. Liesegang was the first to make known the reducing action of persulphate, and observed that old solutions were more active than fresh. Dr. Miethe confirmed this, and N. Schönchen has given the following explanation: Persulphate of ammonium tends to decompose when kept, and liberates a small quantity of free sulphuric acid. The latter causes the formation of ozone, and to this the action upon the silver forming the negative is due. It is therefore desirable to

add a few drops of sulphuric acid to the solution to ensure certainty in using the salt as a reducer. Riston, writing in the *Bulletin de la Société Lorraine*, pronounced the salt an admirable reducer for over-developed plates, but did not find it of use for removing the veil due to over-exposure. Namias recommended it for the removal of yellow stains, from whatever cause arising, and found it more effective than thiocarbamide. A one to two per cent. solution should be used, and, after the stain disappears, the negative should be immersed in a five per cent. solution of sodic sulphite and then washed. Miller has used the salt for making positives. After development of the negative the image is dissolved by immersion in a ten per cent. solution of persulphate. The plate is then washed, exposed to light, and developed as a positive. It is doubtful, however, if this process is superior to that based upon chromic acid.

Turning to the *Bulletin de la Société Française* for June 15, we find an interesting paper by M. A. Hélain on the Theory of Reduction by means of Persulphate of Ammonium. The writer holds that the theory propounded by MM. Lumière and Seyewetz is incorrect. The explanation offered by the latter was, that the reduction depended upon an oxidising and a solvent action of the persulphate upon silver and its salts. They held that these two actions did not counterbalance each other to the same degree upon the surface of the film and within it. The oxidising action to which reduction was due predominated to a certain depth of the film, but beyond, in that portion next the glass, the silver was dissolved and converted to a double salt. The following experiments were made by M. Hélain, and he holds that they are inconsistent with Lumière's theory:—

1. If two brief exposures are made, one direct and the other through the glass, when they are developed and treated with persulphate, it will be found that reduction takes place similarly in both. The second negative, although at the back of the film, does not lose more than the first in the process of reduction. In fact, the tendency is the other way.

2. If a negative is stripped, turned over, and transferred to another plate coated with gelatine, it will be found that the effect is the same when the plate is treated with persulphate. The densest portions of the film will be attacked, whilst the half-tones will remain unaffected.

M. Hélain is inclined to think that the process may bear some resemblance to that described by Captain Colson in his work, *La Plaque Photographique*, wherein he states that the gelatine parts with hydrogen in the process of development, and, in proportion to the opacities, undergoes a modification similar to that which an oxidising agent would produce. If persulphate is most pronounced in its action upon the densest portion of the negative; why should this not be due to the oxidised condition of the gelatine, which has thus become more or less insusceptible to the action of the reagent? In the transparent portions of the film, where there is more gelatine in an unoxidised condition, the persulphate of ammonium spends a portion of its energy upon the gelatine, and the silver suffers less.

#### PYROCATECHIN.

THE *Photographische Mittheilungen* again draws attention to this developer, which is closely related to hydroquinone. As it can now be manufactured chemically pure at a low price, and excellent formulæ for its use have been devised, it will probably take an important place amongst developers. It is often complained that fresh solutions of hydroquinone are prone to fog the plate. Pyrocatechin is free from this defect, and, whether fresh or several months old, yields negatives of great purity. Another advantage is that the image develops regularly and with rapidity. When the image has attained full strength, there is still some latitude, as it retains its character without risk of fog if the plate is left a little longer in the developer. This is more particularly the case with the pyrocatechin-phosphate formula (see THE BRITISH JOURNAL OF PHOTOGRAPHY, May 6, 1898, p. 296), and the pyrocatechin-caustic soda formula as follows:—

##### Solution I.

Sulphite of soda .....	25 grammes.
Distilled water .....	250 c. c.
Pyrocatechin .....	5 grammes.

##### Solution II.

Pure caustic soda .....	8 grammes.
Water .....	250 c. c.

For use take 1 part each of I. and II., and 2 to 6 parts of water.

If the formula for combined development and fixation is used (see THE



BRITISH JOURNAL OF PHOTOGRAPHY, May 19, 1899, p. 311), the characteristics of the plate and the exposure must be taken into consideration. Although there is some latitude even with the combined development and fixation formula, it is desirable to modify the formula for over or under-exposure. In the case of marked under-exposure it would be desirable to add more alkali to the developer, in order to obtain sufficient density.

### CYCLING WITH THE CAMERA.

It is the ambition of the amateur who has passed the elementary stage to take series of views of places of interest he may have visited during the holiday season—it may be his cycling tour—with the ultimate and laudable purpose in view of a lantern lecture—public or private, as the case may be—in the ensuing winter. Some such object as this is greatly to be commended, tending as it does to, at the least, some degree of proficiency in the technical details of negative and lantern-slide making, and bringing into play whatever he may possess of artistic selection and arrangement, without which, it must be admitted, the results would lose much of their value. The titles of such series are not generally called in question, except, maybe, by the hypercritical and hair-splitting onlooker. For instance, if I take a run on my “bike,” with camera *en croupe*, from Nottingham to Clovelly or Land’s End, taking *en route* Charnwood, Quorn, Leicester, Lutterworth, Rugby, Warwick, Stratford, Cheltenham, Gloucester, Bristol, thence (as I can particularly recommend) by steamer to Ilfracombe, on by road to Barnstaple and Bideford, and coach to Clovelly, it can scarcely be hoped for that we secure at the first attempt, and in the space of a limited holiday, *all* the interesting, not to say important, “bits” which will take the eye as we pedal swiftly from county to county. Apart from the failures attributable to a changeable climate, we have those which may be traced to—well, let us say at once our own fault and haste, and those which are distinctly the effect of faulty mechanical fitting of camera. Still, we can do a very great deal at the first time of asking in such a tour as this briefly referred to, weather being favourable.

Naturally one should start with a fairly good notion of where and what to photograph, and a small series of local guides enables one to make plans and form conclusions. As an instance, we may, having done Charnwood and visited the monastery, approach Leicester by Sanvey Gate, the old *sacra via* used by pilgrims on the way to worship at the shrine of St. Margaret. This church, and at least two others, it would not do to pass by. Then we have a bit of Roman wall and pavement well worth plates. Lutterworth may be mentioned for its connexion with Whitfield the Reformer, and its church can be photographed with only a minute or two’s delay. Between here and Rugby we see English rural scenery at its best. Then Rugby brings up reminiscences of *Tom Brown’s School Days*, and you cannot pass through without a shot at the old school and playing fields, and the church and the doctor’s house, all, with the help of a little imagination, as pictured by the author of that well-known volume; then Warwick, with material for at least six exposures, all on the road, and equally well lighted. Kenilworth will not be far off, but probably we shall push on to Stratford, where, if I have not forgotten, the more interesting features of this painfully clean little town can be successfully got at about midday or early afternoon. But, after all, we may say that these places are within easy reach of home, therefore to be visited at any time; that at present we should get further afield, reserve our energies for the (to us) less accessible places. We can use what time we have to spare better at Gloucester, where, aided by Convention literature, we find ourselves quickly on the track of the best pictures.

At Bristol a ride on the tramway will bring to light several good and characteristic views. Reaching Clifton and along the tortuous Severn we get bits in profusion, but down the Channel we may find it disappointing, for Bristol is not the port many of us imagine it to be; still, weather being propitious, something may fall to our camera—Ilfracombe and Lynmouth, where quaint architecture, lovely coast, and land scenery will charm the camerist. Now, as we get closer to Kingsley’s country, the feverish desire for pictures grows upon one, and, with the mind full of “Westward Ho,” is it any wonder if we become practically hypnotised by the genius of that masterpiece of robust fiction? The fact is, we are on a sort of “Tom Tiddler’s ground,” fairly hemmed in by beautiful form and gorgeous colouring. Well, now, what we felt the want of most is a liberal supply of plates, or, what is better, films. The rule, laid down years ago by the old masters of photography, is one to follow, to duplicate the exposures of the subjects to which we attach the most importance; and here I may give a hint; this is, if using rollable film, do not take these duplicate exposures consecutively—duplicate, but on another sequence of films.

Now, it is clear that, blessed with a reasonable amount of sunshine, we must return with a good bag of results, nor—even though the title of our series be “A Rush through Kingsley’s Country,” or “A Scamper through the Midlands”—need (critics notwithstanding) our pictures display haste and hap-hazard work in their selection and finish, though this is, of course, naturally a matter of temperament and practice. Let six men of average artistic perception perambulate a certain district in search of whatever of the picturesque there may be, and the chances are they will

individually and collectively rapidly find out the finer points. If one can select a better, well and good. It is well to follow one’s own ideas and inclinations sometimes, rather than be bound to the popular conception of such a question as the selection of a picture; above all, do not slavishly follow what I may call the “trade photograph,” nor be over-dismayed if others fail to see the picture which is to yourself clear as daylight.

Now, bearing in mind always that to add to the pleasures of the trip we want to secure the best results possible in the time at our disposal and under the conditions available, we see how desirable it is to have a thorough acquaintance with the capabilities of our apparatus, and to have had, if a magazine camera, plenty of practice with it in the matter of carrying and changing the plates. Another point is to ascertain by previous experiment how far and to what extent we may dispense with a tripod, making use of a time exposure is imperative, a wall, gate, window-sill, and so on. The cycle can be quickly converted into a temporary stand if we provide a light bamboo rod, which may be secured by one end to some part of the steering pillar (and readily held up while riding), one of Lancaster’s or Tylar’s camera clips or carriers being used upon which to place the apparatus during the exposure.

Shutters are still for the most part far from perfect in the range allowed. A pneumatic release for quarter or half-second should be a *sine-quâ-non*. During a recent trip round by Southwell, Newark, and Lincoln, I was able once again to test these requirements, and to prove the adequacy of a one-tenth second exposure for the majority of the plates exposed.

The cycle lamp may add somewhat to the weight to be carried, but is useful if plates are to be changed at night or any other time. It is advisable always to carry a fold of ruby or canary medium as religiously as one should the repair outfit. In the event of a “block” in the internal economy of the magazine camera it is usually possible to have access to a dark room or closet (as distinguished from the photographic dark chamber), and in this, even if daylight be only moderately excluded, a lot can be done with the lamp surrounded by the fold of ruby fabric, the plates can be rearranged or changed without much trouble. It is well to remember also that the cycle *pincho* may be made extremely useful as a rough but ready dark tent. Choose a cape which is large and roomy and fits tightly at the wrists, put it on and fasten it well round the neck, then turn the cape over the head, inside out, that is, and you have all the elements of a dark room (in the old wet days tents were made and used no bigger than this), by the use of which with a little assistance from outside, much valuable time may be saved in the event as aforesaid of a block in the camera from a badly fitting plate or carrier; in the latter case the defect can often be put right by sense of touch only.

J. PIRE.

### PHOTOGRAPHIC DODGING.

FROM time to time photographers are suddenly attracted by some particularly striking photograph which, by reason of the apparent difficulty that must have been experienced in producing it, gives rise to no small amount of curiosity as to how such has been accomplished, and it not infrequently happens that credit is claimed for, and also bestowed upon, a class of work that in point of fact lacks the first element of honesty in manipulation, for such striking effects are not obtained by the means generally stated or implied on the face of such productions.

It is well known that “dodging” is largely practised in photography, and it would be difficult indeed for me to attempt to describe a tithe of the subterfuges to which any one can have recourse to obtain some particular effect or result, and there is little doubt that very much of such dodging is quite within the limits of legitimate photography. There is, however, a class of dodging which goes beyond the line of legitimacy when it is practised with the avowed object of deceiving those to whom such work is displayed as genuine results, and sometimes not only the public, but even Judges at our Exhibitions, are deceived by the artfulness of the modern photographic dodger.

Were such dodging harmless, the practice might be brushed aside as quite beyond being deemed worthy of serious consideration; but, unfortunately, it often leads to much misconception on the part of those who have no knowledge of the possibilities of photography, and not infrequently is found doing an incalculable amount of injury to the professional worker, who is at times requested to produce by honest photography similar results to those which have been obtained by means of trickery, and who, on expostulating and explaining the impossibility of executing such effects, receives the cold douch in the answer, “Oh, Mr. So-and-So, the clever amateur, can do it, and why can’t you?”

This is by no means an uncommon experience with professionals, as many might suppose, and I can well remember a case in point when I was called upon to photograph a horse galloping at the rate of forty miles an hour at close quarters, a feat which even the most experienced animal photographer in Scotland had declared to be an impossibility only a few days previously, but which had been declared to be quite easy of accomplishment by the Mr. So-and-So, so clever with his quarter-plate toy snap-shot camera. I can also call to remembrance other false impressions given to the public from almost exactly similar experiences, among the most recent of which was a striking display of



false golfing and cricket studies, that were so artfully conceived and executed, and for which was claimed the merit of genuineness. Were such results capable of being substantiated as genuine, certainly they would have been trotted out by the manufacturers of apparatus, and would have gone a long way to make the fortune of the party lucky enough to produce the particular shutter that had been used.

I was forcibly struck by a very glaring case of this description quite recently, when I was told by a young lady who did a little snap-shot work that Mr. So-and-So had got a very fine outfit, and was able to photograph a cricket-ball quite sharp when being actually struck by the bat. I don't know in what thousandth part of a second it was claimed that the particular shutter was working, but, of course, you know Mr. So-and-So uses very fast plates. Of course I was sceptical, and expressed a strong desire to see a print from this wonderful negative before expressing any decided opinion upon the marvellous accomplishment. I had not long to wait, however, for soon the young lady brought over the photograph in question. It proved to be an exceedingly well-executed picture.

"How long do you say the exposure was in this case?" I asked.

"Oh! about the thousandth part of a second," was the reply.

"Oh! indeed," I answered. "I should say, with the amount of detail shown in this photograph, as well as the depth of definition rendered, an exposure of about two seconds would be nearer the truth"—a remark which naturally made my fair young friend stare.

The picture in question displayed a gentleman standing at the wickets in a very natural pose, as if blocking a cricket ball that had been bowled in an ordinary manner; behind him was the wicket-keeper, and in the distance could be seen long leg. The ball was almost microscopically sharp upon the surface of the bat—in fact, its very seams could be distinctly seen, and the expression on the faces both of the wicket-keeper and batter was really marvellous, and they must have been thoroughly well in the plot to render such natural expressions. But the paint had been laid on too thick, and the deception was, therefore, only too apparent to any one knowing the actual capabilities of photography. On my openly stating my opinion that the picture was the result of trickery, I was met by the remark, "Oh! Mr. So-and-So is awfully clever, you know, and says that even cannon balls can be photographed in their flight."

Now, in this case I took the pains of investigating into the matter, and found that the ball had been pinned to the bat, and was, just as I had stated, in reality a time exposure, and, fairly judged, was a marvellously good result at that. I have since learned that this picture has been displayed upon the screen, where it also created no small amount of sensation. These things do an incalculable amount of injury when trotted out as examples of instantaneous photography, and which a professional is required to produce so easily.

There is also another phase of this photographic dodging which frequently brings doubt on what, after all, is really genuine work, but which, by reason of the apparent difficulty of execution, is looked upon as trickery. I can well remember a genuine instantaneous picture of a little girl in the act of swinging that was on exhibition, but which gave rise to severe comments for and against its genuineness. In this case, however, the results were derived without any trickery, the whole secret of success lay in making the exposure just at the moment the figure was at its highest poise in the air, and the swing was in the act of turning. Yet there were not wanting those who declared the picture to be obtained by trickery, and a gross injustice was done to the party who so cleverly produced it.

It is also well known that extremely striking results of this kind can be obtained by double printing, such as the introduction of figures leaning over billiard tables, when very long exposures would be required, but no exception can be taken to the cleverness displayed in combination work when it is openly admitted. The evil lies in claiming for pictures that have been produced by means of trickery quite a different method of production, and, as I have said, it very frequently falls heavily upon the honest professional whose reputation does not permit of employing these subterfuges.

A. T. NEWTON.

#### UNITY AND PROFESSIONAL STATUS.

THE Editor, commenting in the June 9th number of THE BRITISH JOURNAL OF PHOTOGRAPHY upon the proposed formation of an association amongst New Zealand photographers, "to encourage unity, and raise the status of the profession," whilst generously wishing it success, is evidently doubtful about the prospects of that success. "The same things," he says in support of his doubt, "have been talked of, written about, and occasionally attempted in England, but absolutely without success." Unity and high professional status are both most desirable things, and well worth fighting for, but they will never, to any appreciably useful purpose, be gained under the present order of things. There are too few photographers, separated too widely in ability and trade standing, in ordinarily sized towns, to get on well enough together to form any local combination that should precede, or at any rate form a natural unit portion of, a wider one. A, in the west end, behind his ample plate glass, catering for richer clients, is not disposed to put him-

self upon equal terms with B in the high town. B, in turn, although holding himself to be quite as capable and good a man as A, if not a better one, thinks himself decidedly superior to C, lower down the town, and out of the main street. By the time we get to about G, with a display of faded prints in a cottage window, and a shed studio in an overlooked small back garden, we are altogether beyond the psychological possibilities of equality. Or one cuts prices, the other is the coupon man, a third is anathema, owing to something else, and so the little comedy of photographic life goes on. The same state of things applies more or less in many other directions, amongst chemists, doctors, dentists, and lawyers, who rarely strain themselves in saying anything good of each other. There is, however, one material difference in the case of these latter, in that each has passed the same stiff qualifying examination as his fellow, a leveling factor in their intercourse that in turn tends to bind them together. It would be too much probably, carrying the inference logically out, to demand a compulsory qualifying examination for photographers. In the cases referred to the examinations are primarily, it must be admitted, for the protection of the public more than the gain of those who go in for them, although the latter object is at the same time incidentally served. This necessity does not obtain in the case of the photographer, who, in the event of mistaken treatment of a client, does not, as in the case of the doctor or chemist, say, lay himself open to the possibility of having to square the coroner. It must also be further admitted that the main object aimed at, hard-and-fast money gain, is, granted fair technical ability, more dependent upon a pleasing personality and a knowledge of human nature than high place in an examination list. Still the fact remains that the much be-damned examination is the only recognised practical means of giving a status. Now, as a matter of fact, has the photographer, taking him "by and large," a professional status at all? No; although it is readily admitted that, in many cases, knowledge and skill rise so high that their possessors may in all fairness claim rank as high as that of the members of any profession—medical, legal, or what-not—but, in the main, the term professional, beyond distinguishing between the man who gains a living by the practice of photography and the one who doesn't, is a misnomer. Trade skill, and that of no particularly high order, would be a more correct term. It takes very little to make the ordinary photographer, and the general cheapening down of work, and all the complaining thereat, is directly due to this fact. The entrance gates are hung too easy, and the way through has too much of the easy breadth of the Scriptural one leading to much the same place that the trade is going to, according to those engaged in it. Photographic work, to those not professionally engaged in it, is seen clearly enough to form no exception to the general rule that work always fetches exactly what it is worth. The art is not old enough yet to have lost sight of the high first prices, and comparisons of present ones with them are misleading. It took far more to turn out work then than now; there were fewer engaged in it, and it had, further, the adventitious aid given by the dark-room air of mystery surrounding it in the popular imagination. The comparison should be made, instead, between the prices of to-day, and the time and trouble it has taken the worker to gain sufficient skill and knowledge to do his work. According to this standard photography is paid even a trifle higher for than its value. The introduction of the personal element in the buyer affects him. A man in the case of his own photograph, or that of his wife, child, or sweetheart, is not so keen about gauging its market value as he is of what he buys from his grocer or draper. It is unconsciously held to be not quite the thing to inquire too closely into prices, more than into his whisky and cigar bill, or what he spent altogether upon his holiday, always provided, of course, that they were good and enjoyable. Not that it is thought for a moment inadvisable to try and lift prices; the best effort should be made to do so, but by lifting the quality of the work. This, in isolated instances, can be, and has been, done by the individual; and many classical photographic names will readily suggest themselves as linked with classical prices. But generally, to benefit the many, it can only be done by a systematic effort to confer upon photographers something in the way of the professional status that they as a body lack. Reducing numbers arbitrarily is, of course, out of the question, as trenching upon the far more important, almost sacred, question of personal liberty; reducing numbers by the natural, slower, evolutionary process of weeding out the less fit there can be no objection to. The public will do the weeding, as it has already done in many other directions, and is more insistent upon doing daily in fresh ones. Examination, and the training it presupposes, are the best practicable means for the gaining of that true vigorous growth in the photographic field that will mean a fair chance in the weeding process. It is not a thing that can be introduced suddenly, more than compulsorily, but, like all natural ones that come to stay, must be done gently and gradually. Photographers in business would not entertain for a moment going in for an examination without a distinct, palpable, and immediate gain in view. But few reasonable men would refuse to give weight to a certificate presented by an assistant applying for a place, showing that he had passed an examination in practical work before a recognised board. The assistants of to-day will soon be the masters, and in turn still more likely to look for a higher standard in their assistants. As it is, what test has the master of the capacity of an applicant for a place? A few samples of work done, and these, naturally enough,



the selected—often accidental—best, instead of the desired normal. He is given a trial, fails to work regularly up to his samples, has to leave, and fills up his spare time before he can get another place by grumbling privately and publicly at the woes of assistants and the sine of masters. But is it likely that a photographic master, more than any other, would lightly part with a good man? Hardly. The assistant must not be pressed upon too heavily either. It is not altogether his own fault. He hasn't a standard to work up to and measure himself by. If he had, he would respond, at least the best would, and they are the ones it is desired to catch. Give him the chance in an examination. The rather chaotic character of photography and its processes have hitherto been a great bar to the idea perhaps, but it is rapidly emerging from this state, and there is quite enough of the definite on hand now to form a good solid foundation for an examination. An examining body, selected by an acknowledged authority, which would examine candidates in the necessary theoretical principles of optics and chemistry, and practically in the leading photographic processes, is practicable enough; and a fee of a couple of guineas would cover expenses.

This for a start; what it might lead to is another question, certainly to a desirable broadening all round. Authoritative lectures on art as applied to photography possibly, that might lead photographers with a text-book smattering of art to be more patient laterers than they are, when painters and artists who have made an absorbing life study of it are talking, and, as patient listeners and interested learners, to mutual gain warmer friends. A very valuable point gained when one thinks of the wasted time and misdirected effort now spent in trying to make an out-of-focus photograph look like an artist's work, and smudges impressionist pictures.

Lectures on pose and background, again, would mean fewer crimes in show-cases and windows, and a realisation of the fact that one need not necessarily look unlike himself in a photograph. There is, in short, no end to the advantages that a systematic diffusion of the knowledge now possessed by the few would result in. Finally, and to the essential material end, the public would not be slow in noting the improvement, or unready in paying a better price for the better article. J. REES.

### THE THEORY AND PRACTICE OF EXPOSURE.

THE articles on exposure meters and the speed of plates that have recently appeared in our pages may be supplemented by the following notes of a lecture by Mr. G. F. Wynne on the theory and practice of exposure which that gentleman recently delivered before the Manchester Amateur Photographic Society. We are indebted for the extract to the *Photographic Record*, the Society's well-conducted quarterly organ.

The lecturer said that in his boyish days he was a worker with the old collodion process, and still preserved a few of the negatives taken by himself about the year 1867. He took up the photographic theory again about 1885 on a visit to Norway, where, owing to errors in exposure, through inexperience, the very great majority of the negatives he took were failures.

Afterwards he derived some aid from exposure tables, but could never be certain that the correct exposure was being given, especially under any exceptional circumstances.

About the year 1890 he experimented with a very simple actinometer, made out of a Beecham's pill-box, and found, as a result of experiments, that there was a certain sized stop through which every plate received the correct exposure in the same time that the actinometer paper took to darken to the standard tint. The slower the plate the larger the diaphragm required, and the quicker the plate the smaller the diaphragm required.

These experiments gave him the idea to formulate a list of plate speeds, in which, instead of expressing the sensitiveness of the plate by an arbitrary number, it should be expressed by the size of diaphragm through which the plate would require the actinometer time for its correct exposure under normal conditions.

From this resulted the exposure meter which bore his name, and of which he felt truly proud from its almost universal recognition by the great body of amateurs.

The lecturer said that to a professional photographer, working in his own studio upon the same kind of subject, the same plate, and generally with the same diaphragm, and having a large practical experience, an exposure meter was not a necessity to ensure uniformly good results.

With an amateur, however, the case was entirely different. He went in for work of the most varied description, from the taking of a breaking wave in the one-thousandth part of a second, to photographing a dark church interior in perhaps three or four hours, the latter subject requiring an exposure about 12,000,000 times more than the former.

Dealing with the question, "What is correct exposure?" the lecturer explained that according to his idea of the matter, correct exposure is the exposure given to any negative which, when it was developed with a normal developer, would give in the resulting print the most correct reproduction of the contrasts of light and shade present in the original subject when photographed. If a negative be under-exposed, these contrasts are unduly accentuated with an absence of detail in the

shadows, and, if over-exposed, the contrasts are diminished, the negative being full of detail but flat.

If the contrasts in the subject to be taken are very great, such as in an interior brilliantly lighted with sunlight, and yet having portions in deep shade, or to take another subject, say, of sea and sky with a heavy foreground of trees or houses, the scale of those contrasts cannot possibly be correctly represented by the light and shade scale of the print, the utmost range of which is from white paper to black pigment. In such a subject, and in many others, the exposure must be a compromise, a longer or shorter exposure being given, according to whether the extreme shade is the most important to be correctly represented. Indeed, it is in the question of the variation of exposure due to subject, and the variation necessary to produce the particular effect required, that the amateur is able to exercise his judgment and his powers of reasoning.

The exposure meter, however, for all normal subjects, will give the correct exposure without any calculation whatever, and any variation from this required by the particular subject or the object in view, may be made by the exercise of the amateur's judgment.

The lecturer, dealing separately with the four factors of exposure, viz., light, stop, character of subject, and sensitiveness of plate used, amplified the instructions given in the book with the exposure meter, and by means of the large model worked out several exposures from various assumed values of the factors of exposure.

In regard to the matter of the testing of plate speeds, the lecturer explained that the latitude possessed by nearly all the good brands of plates was so great that only an approximate idea of the speed could be formed by taking an actual photograph.

He had therefore specially designed a simple instrument for testing the speeds of plates, which he exhibited and explained to the members. It consisted essentially of a piece of wood about three inches thick and the size of a half-plate, perforated with a number of holes about three-quarter of an inch diameter. At the top of this perforated block was fitted a sheet of black celluloid in which were a number of graduated perforations, one perforation being over the centre of each of the before-mentioned holes in the block.

The areas of these perforations were graduated in exactly the same geometrical ratio as the scale of diaphragms in the meter, viz., in the progression 1, 2, 3, 4, 6, 8, 12, 16, &c. Over the bottom of the holes in the block was fixed a piece of tracing cloth, or other translucent material, carrying the figures of the scale of diaphragms.

Firstly, having found by experiment that negatives on, say, a Paget Phoenix Plate, were correctly exposed on a normal subject through stop *f*-45, in the actinometer time, and, secondly, that the same plate exposed in the speed-testing instrument to the light of a standard candle, at a distance of two feet for forty seconds, when developed, just showed the number *f*-45, and no higher. The testing of any other plate was a matter of the greatest simplicity, as, if a number of plates were exposed in the instrument exactly in the same way, the highest figure which on development could just be read would indicate the actual and comparative speed of the plate itself.

Mr. Wynne stated that he had personally tested within the last few days every negative plate of English manufacture, and he exhibited a large number of these, the speeds of which varied from *f*-14 to *f*-111, the latter plate being sixty-four times as quick as the former.

Referring to the claims made by the compounders of certain special developers that by their use the speed of a plate was doubled, all his experiments went to disprove this assertion, as he had personally never found that any of them which he had tested would bring up or render visible a higher number on the plate when tested with his sensitometer than was the case with the developer he always used, viz., pyro ammonia with metabisulphite of potash.

### HUNTING FOR PLATINUM ON THE BEACHES OF CALIFORNIA AND OREGON.

[Paper read before the Photographic Society of Philadelphia.]

I HAVE recently made a business trip in the Far West—California, Oregon, Washington, British Columbia, and the North-west Territories—in search of platinum, and your Lantern Committee has been good enough to think that some of the snap-shots that I have made to show the occurrence of platinum in the auriferous sands of the river beaches and the Pacific coast may be of interest. Some of them have no merit whatever, other than that they fairly represent the peculiarities of placer mining; some were made from the car window, some were made in the rain, some were made in the very early morning, or about sunset, and others when I had all the time I wanted and everything was favourable.

Platinum was first found, I believe, in the alluvial deposits of the River Pinto, near its mouth. The River Pinto is in the United States of Columbia, and empties into the Pacific Ocean at Choco Bay. At the present time the supply of platinum is mainly drawn from Russia. The total output of the Russian mines for the year 1897, the last for which there is a public record, was about 174,000 ounces, troy, while the platinum mined in the United States and Canada for the same period of time would be, I presume, about 500 ounces. Platinum is found in



nature in the form of scales, and sometimes in the form of lumps or nuggets. It is reported that a nugget of platinum weighing twenty-six pounds was found in the Ural Mountains. There is also a report of the finding of a platinum nugget in South America weighing about eight pounds. The largest nugget I have found on this trip weighs about one half ounce. Platinum has a specific gravity a little higher than gold. It is ordinarily non-magnetic, ductile, and is soluble only in heated aqua regia.

... I began my hunt for platinum in the north-western part of California. With an ordinary shovel a small quantity of black sand is removed from the bed of the stream in which it is supposed that platinum may be found. This is put into a miner's pan, which is made of heavy sheet iron, about the size and shape of an ordinary milk pan used by farmers. The pan is afterwards filled partly with water, and the contents agitated, so that the heavy particles of earth and sand will settle to the bottom, and the lighter particles rise to the top and be floated off with the water. Small pebbles, &c., large enough to be taken out with the hand, are removed in that way, and the operation is continued until the heavy material is settled in the bottom. This heavy material will consist of iron, gold, platinum, &c., the presence of which can be determined without trouble with the naked eye. By careful use of a magnet most of the magnetic iron can be removed. Great care is necessary, however, as, while pure platinum is non-magnetic, yet, as the grains are small, it may be mixed with the iron mechanically and lost. The gold is separated by the use of quicksilver. It is not necessary, in performing the mechanical operation termed panning, that a pan should be used. This operation is very frequently done with an ordinary shovel, and miners become very expert in the use of the shovel or the pan in separating the above-mentioned materials. Mining in a large way is done with water under pressure, and is termed hydraulic mining. . . . The water for this particular mine is brought about thirty miles, siphoned across a valley something over 200 feet in depth, and is delivered at the nozzle at a pressure of 175 pounds to the inch. . . . The nozzle is seven and a half inches in diameter. By a suitable arrangement the direction of the stream from the nozzle can be changed as directed, and the earthy bank is washed down to bed rock. . . . The large boulders are removed at proper periods, and the finer particles are carried with the waste water through a sluice or flume. The bottom of this sluice is usually paved with wood, after the ordinary method of paving streets. The interstices between the blocks of wood, however, are much greater than if the blocks were laid for street paving. In the sluice, towards the lower end, a suitable quantity of quicksilver is placed, and, by the action of the water, is reasonably well distributed in these interstices between the blocks, the gold that is carried down the sluice amalgamates with the quicksilver, and at intervals is removed, the quicksilver and gold being then separated in the ordinary way. At the lower end of the flume the bottom of the sluice is covered with copper plates, silvered, and any gold that may have passed the sluice without being amalgamated is retained by the copper plate. If the platinum is to be saved, the sluice beyond the part covered by copper plates is covered with a blanket, and the platinum, which is ordinarily in the form of flat scales, is retained by the nap of the blanket. The iron, garnets, monozite, and other heavy material, which is usually round in form, is carried by the force of the water over the nap and into the dump heap below. The blanket used is made so that it can be taken out at any time, and the platinum beaten or shaken off on to a sheet. This is the ordinary method of saving platinum, rather crude and very wasteful. There are several devices for doing the work in a much more scientific and economical way. Platinum is ordinarily found in the beds of streams or ancient river beds, in the vicinity of serpentine or chromite rock. . . . In hydraulic mining there is very considerable difficulty in getting rid of the earth, sand, and gravel, and a few years ago there was an active and bitter fight between the farming and mining industries in California, the principal question of politics hinging on the "Debris Law." On the east side of the Cascade Mountains no hydraulic mine is permitted without complying with the law regarding the overflowing of agricultural lands, but on the west side there are practically no farming lands, and not much attention is paid to the law. The present surface of the bed of a branch of the Trinity River is thirty-seven feet above the original level when mining operations were started. Wherever there was a ranch, the mining company has purchased the land from the proprietor to prevent litigation. In some mining operations, owing to the formation of the ground, it is quite difficult to get down to bed rock and have room to make the proper sluices. In some large mines extensive blasting operations have to be gone through with.

COLONEL W. E. BARROWS.

#### HETT'S DAYLIGHT CHANGING SYSTEM.

MR. CHARLES LOUIS HETT, the well-known mechanical engineer, is the author of this device, which he thus describes:—

"Each sensitive plate is placed in a separate light-tight bag of leatherette, or other suitable material. These bags are about double the length of the plate, and are closed by a double crease in opposite directions. The film side of the plate is distinguished by a mark on the outside of the bag.

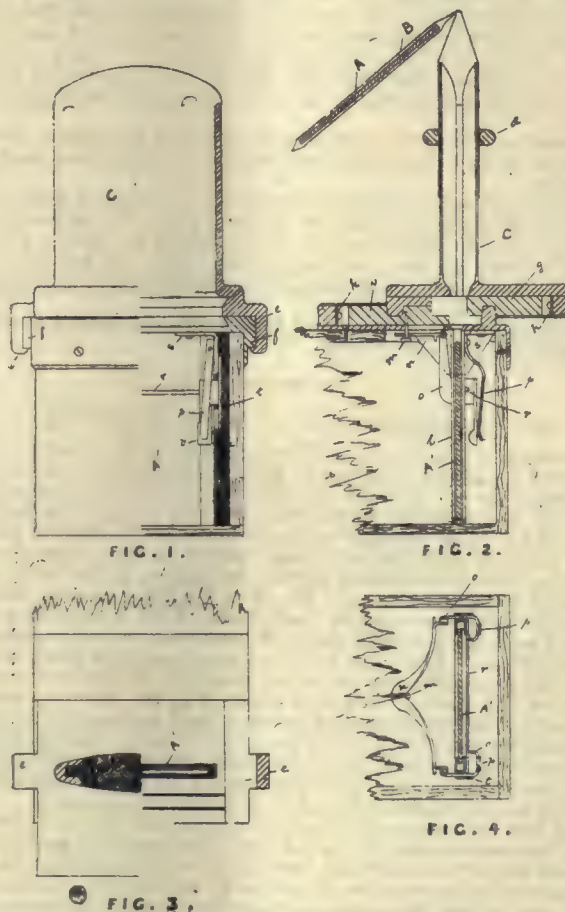
"As a further protection from light, the bags, when loaded, may be stored in outer bags or boxes, the latter being generally the more convenient plan.

"For placing the plate in the camera or dark back I employ a special transfer chamber about the length of the plate employed, or rather more.

"The section of this chamber is a flat oval, with suitable grooves to receive the plates. The upper end is open, and the lower end is closed by a sliding or revolving valve. The form of this valve, and the connexion between the transfer chamber and the camera or dark back may be varied; but I prefer the arrangement shown on the drawing.

"In the accompanying drawing my invention is shown as applied to a camera. In the case of a dark back, but little modification is required beyond the introduction of the ordinary sliding shutter.

"Fig. 1 is a back view of the camera with the transfer chamber in position for inserting a plate. Half is in elevation, and half in section. Fig. 2 is a longitudinal section. Fig. 3 is a plan, half in section, and



half with the transfer chamber removed. Fig. 4 is a plan of an automatic arrangement for pressing the plate against the front of the frame, and thus bringing the film into register.

"A is the plate when in the bag, B, which is placed on the transfer chamber, C, and secured thereto by means of an indiarubber ring, D.

"This ring is circular in section, so that it may readily be rolled from the lower part of the transfer chamber on to the mouth of the bag, or in the reverse direction. A' represents the plate when in position in the camera or dark back; E, E, are hooks on the transfer chamber, which, when the latter is in position, engage with the lugs, F, F, and hold the transfer chamber securely to the camera or dark back; G is a valve which closes the lower end of the transfer chamber, when removed from the camera or dark back; I is a valve which closes the opening in the camera at the same time; H and K are small springs which keep these valves from shaking open; L is the frame containing the plate when in the camera or dark back.

"The mode of operation is as follows:—

"When it is desired to place a plate in the camera or dark back, the outer crease of one of the bags containing a plate is straightened out, and the open end of the transfer chamber inserted into its mouth, taking care that the mark on the bag, indicating the film side of the plate, corresponds with a similar mark on the transfer chamber.

"The indiarubber band, D, which has previously been placed on the transfer chamber, is rolled over the mouth of the bag, holding it tightly, and effectually excluding the light. The transfer chamber is now



attached to the camera, or dark back, by applying it thereto and sliding it in the direction of the lens.

"As the transfer chamber moves it carries with it the valve, *i*, and thus opens the aperture in the camera, or dark back. While the transfer chamber moves the valve, *g*, remains stationary, and thus the lower end of the transfer chamber is opened. The bag, *b*, is now turned vertically upwards. This opens the remaining crease, and the plate drops into the camera, or dark back. The film is brought into register by a light-tight screw through the back, by any suitable arrangement now used for a similar purpose, or by the arrangement shown on the drawing which I now describe. *m* is a set screw tapped into and, therefore, moving with the valve, *i*. *n* is a yoke jointed at each end to levers, *o*, *o*. There is a stop on each end of the yoke, *n*, which bears against the levers, *o*, *o*, and the yoke is thus prevented from falling too low. *p*, *p*, are two springs bearing on the levers, *o*, *o*, and pressing them towards the plate, *a*<sup>1</sup>. *r* is a centre pin, carrying the two levers, *o*, *o*. *s* is a stay, a duplicate of which, not shown on the drawing, is on the other side. These stays support the frame carrying the plate, and also form packings between the cover plates, *t*, *t*, and the frame. *u* is a packing for the like purpose. The effect of *s* and *u* is to separate the cover plates, *t*, *t*, from the frame, and to leave room for the working of the levers, *o*, *o*.

The transfer chamber is shown in position, and the pin, *m*, acting through the yoke, *n*, holds the lower ends of the levers, *o*, *o*, clear of the plate, *a*<sup>1</sup>.

The transfer chamber is removed by sliding it backwards away from the lens, until the hooks, *e*, *e*, clear the lugs, *f*, *f*. This action closes the valves, *g* and *i*. The valve, *i*, in closing, leaves the yoke, *n*, free to move away from the lens, and consequently allows the springs, *p*, *p*, to press the lower ends of the levers, *o*, *o*, on to the back of the plate, *a*<sup>1</sup>, thus bringing the film into register.

The removal of the plate is effected by replacing the transfer chamber and reversing the above operations.

### THE PHOTOGRAPHY OF ANIMALS IN MOTION.

A NEW edition of Mr. Muybridge's book on animals in motion has just been issued by Messrs. Chapman & Hall. The work of this eminent photographer was at one time very imperfectly appreciated and understood; but modern critics appear more disposed to rate it at its just value. One of them remarks that the book contains "a series of photographs taken at rapid intervals, and, arranged in line consecutively, display the different movements of walk, trot, gallop, and so forth, in a number of different animals." We have illustrated here in oblong-shaped plates the ponderous gait of the elephant, the furtive stalk of the tiger, and even the suspended sloth. The human species is represented by "an athlete;" flying and walking birds show their paces, and a kicking mule completes the list of the principal diversities of animal locomotion and motion. The facts gathered by Mr. Muybridge enable him to criticise many statues and pictures, both ancient and modern. It is pleasing to find that many of the great artists and sculptors come unscathed out of the ordeal. The real artist, who can and does observe, sees the varied movements as they really are; the inferior craftsman is apt to put the conventional notion instead of the real appearance.

It has been held, apparently, by some that the horse cannot only walk, amble, trot, canter, and gallop, but that there is a faster pace still, to which the name "running" has been given. Careful photographs and a comparison of the succession of the feet in movement shows that no such "pace" exists. The gallop itself has been singularly misinterpreted by the moderns—by many of them at least. The author is compelled to use harsh terms, and to say with some truth that such illustrations "exhibit an entire absence of careful observation, unprejudiced impression, or serious reasoning." The type to which he refers is well exhibited by the leaden horses in a game once prevalent, that called the Race Game, where jockeys mounted on horses progress slowly over a marked cardboard racecourse; the horses here are elongated, the heads stretched out, the fore feet well to the fore; the hind feet equally extended behind. Such an attitude never occurs in the galloping horse. On the other hand, a frequent representation of this pace is seen in statues where the animal has the hind limbs planted on the ground and the fore limbs elevated as if to jump; this, rather curiously, is an accurate picture of one of the phases of the gallop.

### PATENTS IN 1898.

THE report of the Comptroller-General of Patents for the year 1898 has just been issued. For the first time since the Act of 1884 came into force, points out the *Journal of the Society of Arts*, there has been a distinct falling off in the number of applications for patents, the applications in 1898 numbering 27,659 as against 30,952 in 1897, a decrease of 3293, or 10·7 per cent. In the year 1895 there was a falling off as compared with the previous year, but the difference at that time was a little more than 300. The Comptroller considers the rapid growth in the number of applications which took place in 1896 and 1897 was to be attributed to the

activity of the cycle industry, and that there is little doubt that the decline in that industry has caused the present decline of numbers.

As the 1884 Act has now been in operation for fourteen years, the earliest patents granted under it have run out their full time. It appears that 5·5 per cent. of the 1885 patents have been maintained for the full fourteen-year period; the proportion of the previous year, 1884, was 4·5 per cent. The average percentage of patents granted under the 1882 Act which ran for their full term was 6 per cent., so that the conclusion may fairly be drawn that the reduction of initial fees in 1884 has only slightly diminished the average value of the patents sealed, while it has added considerably to their number.

Of the total number of applications, 17,389 come from England and Wales, 1395 from Scotland, and 502 from Ireland. There are only three foreign countries from which large numbers of applications come—2629 from the United States, 2599 from Germany, and 1133 from France. There are only eight other countries from which as many as 100 applications come.

An elaborate table, printed as an appendix to the report, shows the different classes under which inventions may be arranged for the period of 1884–97. Later figures cannot be given, on account of the time which may elapse before the acceptance of a complete specification following on an application. There has been a great increase under certain of the chemical classes, attributed to the development of the acetylene industry, which is also responsible for a large increase under lamps. In the following classes the number of patents is said to be practically stationary: Agriculture, guns and ammunition, sanitation, ships, and textiles. There has been a decrease as regards iron and steel, cutlery, and steam engines, and a considerable increase in advertising, electric lamps, and photography. Since 1884 the inventions relating to the cycling industry have increased sixfold, but the advance in 1898 was barely maintained in 1897. The numbers for 1898 are not yet fully available, but it is believed that the extraordinary inventive activity in this industry has reached a climax, and now gives signs of abatement. As might be expected, an unusually large number of valueless inventions appear to be included in this increase. Of 6000 applications made in 1897 in connexion with cycles, only 2300 were completed—much less than the average. An increase in air and gas engines is attributed to the number of inventions for oil engines intended for motor cars. Here, however, there is a decline in 1897, which appears to be continued in 1898. Among minor industries, hatmaking and tobacco show substantial increases, and sugar and watchmaking substantial decreases. Since the passing of the Workmen's Compensation Act the number of applications relating to guards for preventing accidents with machinery has very largely increased. Immediately after the railway accident at Wellingborough Station, caused by a luggage truck falling on to the line in front of an express train, there was a great increase in inventions for railway platform luggage trucks. As showing the relation between passing events and the course of invention, it is mentioned that the publication in a London morning paper of a letter relating to the waste of horse feed in London was followed within five weeks by thirty-four applications for patents for nosebags for horses, the average number per annum being about twelve.

## Our Editorial Table.

### TASCHENBUCH DER PRACTISCHEN PHOTOGRAPHIE.

Gustav Schmidt, Berlin.

THIS handy little volume has entered upon its fifth edition, and, as the first made its appearance in 1891, Dr. E. Vogel may regard this fact as substantial proof of the usefulness of his work. The directions and formulae are clear and concise, and Dr. Vogel has freely illustrated the book, to give the reader a clear insight into the subject. In each branch the work has been brought well up to date.

### JAHRBUCH FÜR PHOTOGRAPHIE UND REPRODUKTIONSTECHNIK, 1899.

Wilhelm Knapp, Halle a/S.

THE thirteenth volume of this valuable record of photographic work has reached us, and subscribers will not fail to appreciate the large addition Dr. Eder has been enabled to make to its pages. The original articles touch upon many important subjects which have excited the attention of photographers during the past year. As might be expected, the latest innovations in photo-mechanical work form an important feature of the volume, and in this respect the illustrations at the end add largely to the value of the book. Amongst the contributors we notice the names of Dr. G. Aarland, Ph. Ritter von Schoeller, Dr. J. Husnik, Raimund Rapp, Aug. Albert, Dr. Andresen, A. von Hübb, Professor Valenta, Dr. Mieths, J. Gaedicke, and many other leading Continental workers. The record of the year's progress is arranged according to subject, and is very thorough and complete.



## News and Notes.

THE South London Photographic Society's eight days' tour in Ireland (Royal Meath and County Wicklow), including sixty miles of driving, takes place July 21 to July 30.

THE Bootle Photographic Society's Sixth Annual Exhibition of photographic work will be held in the Masonic Hall, Merton-road, Bootle, Thursday, Friday, and Saturday, October 26, 27, and 28. All entries and other communications to be addressed to the Hon. Secretary, Mr. Thomas A. Dodd, 188, Strand-road, Bootle, Liverpool.

MESSRS. TAYLOR, TAYLOR, & HOBSON, of Leicester, write: "Our business having outgrown the capacity of Slate-street Works, we have erected new factory and office buildings, to be known as Stoughton-street Works, Leicester. These buildings, equipped with every modern convenience, will, we trust, enable us to improve our products and to execute orders with greater despatch."

PHOTOGRAPHIC CLUB.—Anderson's Hotel, Fleet-street, E.C., Wednesday evening, July 19, at eight o'clock. Discussion, "The New Photographic Printing Papers." Visitors are admitted to the meetings of the Club on the personal introduction of a member, or by invitation cards, which the Hon. Secretary (Mr. W. R. Stretton, 4, Queen-street-place, E.C.) will be pleased to forward on application.

THE very latest X-ray story runs as follows:—Mr. John Foster, a Cleveland millionaire, was suffering from a serious abdominal ailment, and the doctor made him swallow an indiarubber bulb, covered with a photographic film, which was inflated until it completely filled the stomach. An X-ray exposure was then made, the film withdrawn, and an excellent photograph of the interior of the stomach, revealing the presence of a large tumour, secured.

SELECTION COMMITTEE FOR THE AMERICAN INSTITUTE SALON.—The following photographers and artists have consented to act on the Selection Committee for the Salon of the American Institute: Pirie Macdonald, Albany, N.Y.; Rudolf Eickemeyer, Yonkers, N.Y.; E. Lee Ferguson, Washington, D.C.; Hinsdale Smith, Springfield, Mass.; Francis C. Jones, N.A., New York City; Alexander Black, Brooklyn, N.Y.; E. Wood Perry, N.A., New York City; W. Granville, Smith, New York City. It will be noted that two of these are artists of high standing, but both of them are photographers as well as painters.

LORD SALISBURY AS CHEMIST.—Lord Salisbury, whose intense interest in chemical research knows no lull, has, declares the *Medical Press and Circular*, discovered and completed an important chemical process in his private laboratory at Hatfield. The results, according to this journal, will be made known to the world on his behalf at a forthcoming meeting of one of the learned societies. The scientific world has for long known that it had in the English Premier a devoted student to chemical science. Despite the arduous duties attached to his official post, he, nevertheless, snatches every available opportunity of prosecuting his favourite study.

THE South London Photographic Society's Third Continental Excursion to Belgium takes place from August 19-27. The leaders are Messrs. William F. Slater, F.R.P.S., and Walter D. Welford, F.R.P.S. The estimated total cost is 3*l.* 16*s.* (including saloon on boat). An attractive programme has been prepared. The leaders have been able to obtain considerable reductions both in hotel charges and railway fares. It is expected that a meeting will be arranged with the Brussels section of the Belgian Photographic Association, on one of the evenings, which will be entirely of a social nature. All members of other societies are invited to the excursion. Any further particulars may be obtained from Mr. William F. Slater, 5, First-parade, High-road, Lee, London, S.E., or Mr. Walter D. Welford, 19, Southampton-buildings, Chancery-lane, London, W.C.

SUNDAY TRADING.—John Hawkey, photographer, of Humber-street, Cleethorpes, pleaded guilty, at the Grimsby Police Court, to having traded on a Sunday. Defendant admitted that he was open. He had been used to open on a Sunday, and, as a matter of fact, Sunday was the best day for photographers. People could get a bath, refreshments, cigars, or have a ride on Sunday at Cleethorpes, he thought they ought to be able to get their photographs taken. Fines 1*s.* and 5*s.* 6*d.* costs. Defendant said he would pay 5*l.* for a special licence to open on Sunday. There was a similar charge against R. Gildershaw, of 61, Queen-street, Cleethorpes, who keeps some sort of a menagerie. Superintendent Stennett said that he found defendant was not able under the Act under which he had been proceeded against, although he might be liable under another Act. The charge would be withdrawn.

THE BICHROMATE TRADE.—With regard to the making of bichromate of potash, which is widely used in dyeing and in other manufactures, there is no doubt, points out Dr. Andrew Wilson in *The Weekly Scotsman*, the trade is an unhealthy one. The particles of dust arising from the powdering and firing of chromic ironstone act on the lining membrane of the nose, and occasion with destruction of the partition (or septum) between the nostrils apt to occur. But Dr. Arlidge tells us, in his *Diseases of Occupation*, that precisely the same result occurs in cement-workers, so that some doubt may be entertained that chrome dust is a special agent in producing the disease in question. Then, it is true that on abraded portions of skin ulcers form, owing to the irritation set up by the emanation from the bichromate, and after these have healed "indelible scars remain." Dr. Arlidge adds that "men who handle the stuff best escape the ills of the trade," while subacetate of lead in solution is used as an outward application for the skin eruptions. Undoubtedly chromate works represent places where there is danger to the workers involved in their labours, just as needle-grinding and white-lead working are also accounted very unhealthy trades. It remains for science, the wiser, and, above all, for the common philanthropy of employers, to abate the ills complained of. That they will abolish them utterly is a hope not to be entertained this side of the millennium.

INCANDESCENT GAS MANTLES.—The commercial incandescent mantles of to-day are composed almost entirely of oxide of thorium,  $\text{ThO}_2$ , to which has been added a small quantity of oxide of cerium,  $\text{CeO}_2$ , varying from 0.5 to 2.0 per cent. With the exception of a small quantity of lime they only contain traces of impurities, such as nitrate of thorium, and oxides of zirconium, neodymium, lanthanum, and yttrium. To satisfy himself that these impurities have no appreciable influence on the luminous power of the mantle, the author has undertaken a series of photometric measurements, from which he has been able to establish the following conclusions: The oxides of zirconium, lanthanum, and yttrium do not increase the illuminating power of the mantles. Oxide of neodymium increases it to a slight extent. The admixture of 1 per cent. of the oxides of zirconium, neodymium, lanthanum, or yttrium, has no influence on mantles containing 0.5 per cent. of lime. The lime contained in the mantles, doubtless, comes from the ash of the tissue used in their manufacture. As this substance increases the fragility of the mantles, it should be eliminated as far as possible.

BOTH the chemists and photographers of the Rochdale district have heard with very great regret the news of the death of Mr. Hermann Bamford, the well-known chemist and druggist and Secretary of the local Photographic Society. Mr. Bamford had a very short illness. He caught a chill, and on Sunday of last week pneumonia set in. He gradually grew worse, and died on Tuesday evening of last week. Mr. Bamford's death, at the early age of thirty-one years, has come as a sad shock to his many friends. He leaves a widow and one child. Dr. Hodgson was deceased's medical attendant. Mr. Bamford was the youngest son of the late Councillor Bamford, and was associated with his brother, Mr. William Bamford, in the chemist's business which they carried on in Yorkshire-street under the title of "The Executors of the late J. W. Bamford." Deceased took great interest in photography, and was well known in the town and district as a magic-lanternist. He had been actively identified with the Rochdale and District Photographic Society from its inception, and for several years prior to his death he acted as Secretary of the Society. He had been connected with the Providence Congregational School from his childhood. Mr. Bamford was a man of quiet, unostentatious demeanour, and was warmly esteemed by a large circle of friends. The funeral took place on Friday afternoon last at Heywood Cemetery. It was an unostentatious ceremony, only the nearest relatives and friends being present. The Rev. B. W. Jackson, of Providence Chapel, conducted the funeral services both at the house and at the cemetery. The coffin was covered with wreaths. Messrs. Barton & Son had charge of the funeral arrangements.

SOME OLD PRINTING PROCESSES WORTH TRYING.—"By way of experiment, or perhaps amusement, or maybe, after all, with the hope of modifying some of the old printing processes, so as to make them available by the light which the new photography may shed upon them, I have been ransacking the old books for forgotten formulæ, and have had some very good results, which some of your readers may like to try," writes Mr. Hahn in the *American Journal of Photography*. "Here is one worth trying, which furnishes quick-printing paper: Float the paper for five minutes on a solution of bichloride of mercury; saturated solution of bichloride of mercury, 6 drachms; water, 1 pint. When dry, float in a darkened room in a silver solution, 40 grains to ounce. The exposure required is about five seconds in sunlight, or a minute in dull weather, until a faint image is produced, then develop with: Sulphate of iron,  $\frac{1}{2}$  ounce; water, 1 pint; glacial acetic acid, 1 drachm. Wash and fix with hypo. In place of the iron developer very dilute metol, or para-amidophenol, may be used with good effect. These prints need no toning and are quite pleasing in colour. Another process, long forgotten, gives most beautiful results: Take syrup of iodide of iron (which may be had at the apothecary's), distilled water, each 2 drachms; tincture of iodine, 10 drops, and mix. Brush over one side of well-glazed paper, and, after a few minutes, dry with blotting-pad and then wash with nitrate of silver, 1 drachm; distilled water, 1 ounce; and dry in dark. Expose in a printing frame, when a latent image is formed, which all that is required to develop is a wash in pure water and preservation for a short time in the dark, varying with the degree of exposure. The exposure induces an action which is carried on in the dark. After the image is completely evolved, the free silver is eliminated by fixing in hypo."

THE PROPER READING DISTANCE.—"At a distance of several metres or yards," says Dr. Norburne B. Jenkins in the *Medical Record*, "little or no muscular effort is required for the normal eye to see objects distinctly; but an extreme exertion of the ciliary muscle, which controls the crystalline lens, is necessary if the vision be directed to an object a few centimetres or half-inches distant from the eye. The following may illustrate the work of the muscles of the eye in reading at several distances: A sheet of paper about twenty centimetres (eight inches) square, printed with type sufficiently large to be easily read at five or six metres or yards, is placed at this distance from a person with normal or emmetropic eyes. Practically no contraction of the muscles of convergence or of the ciliary muscles is necessary in order to read the type. Should the paper be placed a metre or yard from the eyes, the ciliary muscles and the muscles controlling the motions of the eyeballs are called upon for additional work, but no inconvenience is occasioned to emmetropic eyes by prolonged vision at this distance. If the paper now be placed within a few centimetres or half-inches of the eyes, the ciliary muscles contract to their utmost. The internal recti likewise are in a state of extreme exertion in accomplishing the convergence necessary in order that both eyes may see the same type at the same instant. The muscles are no longer adequate to the increased tension. They become exhausted and vision is embarrassed. The type is alternately blurred and distinct, in consequence of the alternate failure and recovery of the muscles. Should this process continue for many minutes, pain and vertigo come on, and the sufferer is forced to direct his vision from the paper. The nearer objects approach the eyes, the greater will be the necessary muscular effort and the sooner will the muscles refuse to perform their functions; the farther the type is held from the eyes, the less is the requisite muscular effort; hence it is probable that the farthest point at which distinct reading vision is possible is the proper distance for continuous read-



ing. Probably this point is more than thirty-five centimetres (fourteen inches) distant from the eyes, and is dependent upon the strength of the muscles, habit, and the visual acuity."

## Patent News.

The following applications for Patents were made between June 26 and July 1, 1899:—

- EXPOSURE METER.**—No. 13,216. "An Improved Apparatus for Determining Exposures in Photographic Printing." E. E. CORNABY.
- CAMERAS.**—No. 13,300. "Improvements in Photographic Cameras." THE LONDON STEREOSCOPIC AND PHOTOGRAPHIC COMPANY, Limited, and W. E. MARTIN.
- CINEMATOGRAPHY.**—No. 13,369. "Improvements relating to Cinematograph Apparatus." E. E. BARTLETT.
- CINEMATOGRAPHY.**—No. 13,370. "Improvements relating to Cinematograph Apparatus." E. E. BARTLETT.
- STANDS.**—No. 13,391. "An Improvement applicable to Photographic Camera Stands." Complete specification. J. WILKINSON and A. WILKINSON.
- FINISHING PRINTS.**—No. 13,402. "Improved Method of 'Finishing' Photographic Prints." C. VANDYK.
- ANIMATED PHOTOGRAPHY.**—No. 13,421. "Improved Means for simultaneously Operating Animated Pictures and a Phonograph or Gramophone." Complete specification. E. MALKE.
- ANIMATED PHOTOGRAPHY.**—No. 13,422. "Improved Means for Illuminating Animated Pictures." Complete specification. E. MALKE.
- CAMERAS.**—No. 13,524. "Improvements in Photographic Cameras." A. H. RIETZSCHEL.
- COLOUR PHOTOGRAPHY.**—No. 13,568. "Pressure Plate for Photographic Dark Slides used in the 'Lippmann Process' of Colour Photography." A. W. PENROSE and W. GAMBLE.
- SHUTTERS.**—No. 13,648. "Improvements in Photographic Shutters." THE THORNTON-PICKARD MANUFACTURING COMPANY, Limited, and C. G. WOODHEAD.
- COLOUR PHOTOGRAPHY.**—No. 13,666. "Improvements in the Method of and Means for Producing Images in Complementary Colours, suitable also for Use in Taking, Projecting, Inspecting, Testing, or Combining Three-colour Photographs, Prints, or the like." G. SELLE.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
15.....	Croydon Camera Club .....	Excursion: Epping Forest. Leader, A. Willcocks.
17.....	South London .....	Exhibitions and Exhibitors. W. D. Welford.
18.....	Birmingham Photo. Society ..	Excursion: Tewkesbury and River Avon.
18.....	Gospel Oak .....	A Chat about Lenses. H. Billingsley.
18.....	Hackney .....	Carbon Demonstration. Autotype Co.
19.....	Croydon Camera Club .....	My Experiences with Kinematographs. Hector Maclean.
19.....	Oldham .....	Excursion: Dukeries. Leader, J. Chadwick.
19.....	Photographic Club .....	Discussion: The New Photographic Printing Papers.
19.....	West Surrey .....	Affiliation Lecture: Defects, and their Remedies. E. Dockree.
20.....	Manchester Amateur .....	Gum Bichromate. W. H. Machin.
22.....	Ashton-under-Lyne.....	Excursion: Moberley. Leader, Thos. Glazebrook.
22.....	Hackney .....	Excursion: Guy's Hospital (Interior). Leader, W. A. Ellington.
22.....	Manchester Amateur .....	Excursion: Alderley. Leader, Councillor G. H. B. Wheeler.
23.....	Oldham .....	Excursion: Chester. Leader, C. A. Hempstock.
2.....	South London .....	Excursion: Addington Park. Leader, F. Goddard.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 6.—Mr. H. C. Rapson in the chair.

Mr. R. CHILD BAYLEY referred to a discussion upon the merits of Agfa as an intensifier a few weeks back, when he believed there was some uncertainty about the results. He showed two negatives which had been developed and fixed both together in a combined bath, but slightly under-developed. He intensified one with agfa, and, beyond the fact that it took a quarter of an hour instead of three minutes, the result was satisfactory.

Mr. S. H. FRY examined the specimen and said that, if he had not been told that the resulting print of the intensified negative showed more contrast than before, he should rather have thought the fresh deposit a general one all over the plate.

Mr. A. MACKIE agreed that there was decided intensification, but with it considerable blocking up of the shadows.

Mr. A. HADDON said this was due to peculiarities of the emulsion. He found a considerable and granular deposit of silver in the rebate under a magnifier.

Mr. MACKIE said that he had a thin negative which wanted but a very slight increase of density, which was rather difficult to get. However, he had some Wellington's intensifier, of which he added a small quantity to an ortho. sulphite, and carbonate developer he was using. The increased density he got was just to his taste; but he noticed that the solution threw down a dense yellow deposit, similar to ferrous oxalate.

The discussion became one upon the merits of Wellington's method of intensification, and it was found that, while some succeeded with it, others noticed that its behaviour varied with different makes of plate and sometimes with different batches of the same make. Some plates did not seem to be amenable to its influence at all.

Mr. J. S. TEAPE showed some comparative examples of the method of reduction advocated by him at a previous meeting and involving the use of permanganate of potash and sulphuric acid. He had altered the formula first given, and now gave the stock solution as follows:—

Permanganate of potash .....	3 grains.
Sulphuric acid .....	30 minims.
Water .....	24 ounces.

This was diluted, for negatives, by an equal bulk of water, and no stain, first noticed, now resulted. He was in a position to repeat his claims for it as a reducer of the characteristics of persulphate of ammonium, viz., in its power of reducing excessive densities without affecting the lighter detail and halftones. The plates were divided in three strips, one showing the capabilities of the permanganate reducer, one those of persulphate, and the third the original unaltered negative. The action by the persulphate required only five minutes against twenty minutes for the permanganate, and this he placed to the credit of the latter, in that it was more under control for that reason. Mr. Teape also showed some trials he had made on gelatino-chloride prints with the permanganate reducer at a strength of one drachm of stock to two ounces of water. It would be found very valuable for this branch of work, he said, and was not, to his knowledge, equalled by other methods. It was curious too that, in one case at least, the delicate tones had been intensified while the denser parts had been reduced.

Mr. MACKIE referred to the bichromate and sulphuric acid reducer, which it will be remembered, has been commented upon before by Mr. Teape, and said that for some purposes it was very satisfactory. He also touched upon a method mentioned by Mr. Henderson, which he had used for the improvement of an under-developed negative. It was bleached with mercury, and subsequently treated with iodide of potassium, an excellent printing negative resulting.

Several reducers and intensifiers having now been named, further discussion turned upon the utility of these aids.

Mr. S. H. FRY spoke against them, as dodges of a misleading and unchievous nature, and as tending to reduce the practice of photography from high to a low level. He was sorry to see that even old photographers were much deceived as the excusable beginner.

A heated argument ensued as to the possibility, asserted on one side, of correcting for bad exposures by intensification or reduction, which was denied by partisans of the other side, who asserted that only errors of development could be corrected by such methods, although it might be possible to obtain less bad prints by their aid; but to argue that a badly exposed plate could ever be made to equal a correctly exposed plate was erroneous in the extreme.

Mr. FRY said he had found in business that it took six months to get a man out of the habit of relying upon dodging for his negatives, and to rely instead upon good exposure and good development.

Mr. W. D. WELFORD showed a combination negative made up of a foreground of one and a sky negative, and explained the means he took to make a satisfactory join in the reproduction. After development, the plate was washed, and the gas turned up, the light being allowed access to the part which marked the join. The light was then lowered, and the fresh exposure developed up to meet his requirements.

### PHOTOGRAPHIC CLUB.

JULY 5.—Mr. H. Snowden Ward in the chair.

Mr. F. A. BRIDGE showed some mounts stamped in decorative relief with the name of the photographer, which he had been asked to bring forward on behalf of Alexander Aguilon, of the house of Grimaud & Chartier, of Paris.

Mr. T. BEDDING gave a chat on the subject of "Binocular Vision and the Stereoscope."

Mr. FRANK HAES referred to the adjustments which some abnormal sight required, and alluded to a case of strabismus and difference of focus combined, which has been accommodated to the stereoscope by moving the lenses to the peculiar conditions.

Mr. CHARLES WALLIS said he had a great deal to do with field glasses, and was often asked which was the more powerful of two telescopes. He was quite able, by focussing the two separately on some object, and holding one in each eye, to determine this point, whereas other people failed, or had great difficulty in doing so, and he supposed that this was due to the muscular training of the eye to which the lecturer had referred.

**Sheffield Photographic Society.**—At the usual monthly meeting of the Society, held at their rooms in the Masonic Hall, Surrey-street, on Tuesday evening, Mr. J. Tomlinson (the President) occupied the chair, and Mr. SPARHAM CAMP gave a practical demonstration on the

### PLATINOTYPE-PRINTING PROCESS.

hot and cold development, rough and smooth papers, using both the Platotype Company's and the new Platona paper. The lecturer said it was necessary that the paper be kept free from damp, and to do this properly a tin tube must be provided to store the paper. Mr. Camp showed how the prints could be developed by floating on the cold developer. The hot bath gave slightly warmer tones than the cold bath, and development was quicker.



It was shown that warm tones could be got during development by adding a small quantity of a solution of bichloride of mercury to the developer. Mr. Camp then toned some prints with the uranium nitrate bath, and said prints might be obtained of any warm colour by this method. The bath was used hot, as it worked much quicker than when used cold. The lecturer alluded to the Packham method of toning, but preferred the uranium nitrate, as the Packham system was more of a staining than a toning process. Mr. Camp then showed how platinum prints could be controlled in development by using a developer partly composed of glycerine. He first rubbed the print over with pure glycerine, he then used a brush, and with a developer weakened with water he brushed the developer over the print, and the picture came up slowly and under control. By this method over-exposed prints might be saved and local development applied. Mr. Camp handed round the room a lot of fine pictures he had got on platinotype, which were much admired. The demonstrator claimed for this process a first place for photographic printing papers, as results were got which were absolutely permanent and most artistic. A very hearty vote of thanks was accorded Mr. Camp for his instructive and practical demonstration.

#### FORTHCOMING EXHIBITIONS.

1899.

- August ..... One-and-All Flower Show at the Crystal Palace (Photographic Classes). Hon. Secretary, E. O. Greening, 3, Agar-street, Charing Cross, W.C.
- Sept. 22-Nov. 4 ..... Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.
- „ 25-Nov. 11..... Royal Photographic Society. Hon. Secretary, Colonel J. Waterhouse, 12, Hanover-square, W.
- October 18-24 ..... Croydon Camera Club.
- „ 22-Nov. 19... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.
- Nov. 27-Dec. 18 ..... American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.
- December 7-9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

### Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### LONG-RANGE PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—With regard to your comments on Mr. Dallmeyer's long-distance view of the Isle of Wight, may I point out that the island, instead of being twenty-two miles across the water, is only twelve from Boscombe. Twenty-two miles is about the distance of Newport and Caribroke, the high ground in the neighbourhood of which is, I believe, visible. Ten miles of the twenty-two are then overland.

From Bournemouth, thirteen and a half miles from the Needles, I have with a four-and-three-quarter-inch lens obtained a fairly good view. The high cliffs behind the Needles and a good portion of the coast-line are well defined, though the Needles themselves are not visible. On the negative the outline of the island is faintly visible almost as far as the mainland and also in the other direction towards St. Catherine's Point, the whole length of the image being about an inch and a half, and the high cliff at the Needles measuring about one-fortieth of an inch in height.

From Folkestone there is an opportunity for a much longer shot in the direction of the French coast, which is often clearly visible. This should be an excellent practice range for the tele-photo, the distance being twenty-three miles over water and inland objects some miles from the coast being often in sight. I should like to know if this has been attempted.

It has occurred to me that the summit of Snowdon should be an excellent station for obtaining long-distance views. You are here often above the mist, the buildings afford shelter from the wind; there is now a railway to carry up the apparatus, and there are possible ranges up to eighty miles. A view of the Isle of Man from Snowdon at a range of seventy-five miles would be a truly remarkable achievement!

Nearer London there must be plenty of opportunities of obtaining the

powers of the tele-photo at long ranges, but there seems to be very little done in this way. The South Downs afford plenty of good stations, and near the sea the atmosphere is often remarkably clear. A very accessible and little-frequented spot is the summit of Beachy Head. From here there are many suitable objects at considerable distance overland, and you are not likely to be disturbed by inquisitive visitors, even if you stop there all day. It is best reached from the Old Town, but a still day must be chosen, for there is absolutely no protection from the wind.

I am surprised that the possibility of securing exceptional views, that cannot otherwise be obtained, has not more strongly attracted enterprising photographers. In Wales there is a great opportunity of securing fine bold mountain views with the tele-photo lens, views that cannot be possibly secured with an ordinary lens, for the finest peaks only show their most striking outlines at distances of six or eight miles, or more.

In the case of Snowdon, the clearness of the atmosphere can only be ascertained by making an ascent, the state of the weather at the foot being a very uncertain guide as to the conditions prevailing at the summit, 2000 feet higher. I once made an ascent from the Pen-y-Gwryd side at one o'clock in the morning in heavy rain, the top being shrouded in mist, saw the finest sunrise and best view of the year, and descended to Beddgelert through another thick mist. September is perhaps the best month for a clear view, but it is often intensely cold at the summit. It was below 40° F. on the above occasion at the top, and about 70° at the foot of the mountain.

Those who are fond of climbing, and who have sporting tastes, should find long-range photography among mountains very attractive. Even if baffled by the weather, you have the pleasure of the climb, and are certainly no worse off than after a day's fishing without a bite, or a day's shooting without coming in range of anything worth powder and shot; and these are common experiences that every sportsman is willing to risk. Success may come but seldom, but, when it does arrive, you will be in possession of a photograph that is for the time unique, and that probably few others will succeed in acquiring. There is a sporting interest about tele-photography, quite apart from the scientific or pictorial value of the results.—I am, yours, &c., C. WELBORNE PIPER.

46, Shooter's Hill-road, Blackheath, S.E., July 10, 1899.

#### PHOTOGRAPHY IN DOTS.

To the EDITORS.

GENTLEMEN,—I beg to enclose you a couple of small specimens of two screen negatives showing a coarse and fine grain effect, though both are taken through the same screen. I also thank you for the editorial reply to Mr. Wheeler, and I may say that my screens are quite opaque in the grain, and, no doubt, could be used as process screens, as one of the prints would show, the dots in the shadows being quite clear. The enclosed, however, were not made on "process" plates, but, undoubtedly, would tell better when properly handled. I have been using the screen for view work out of doors, and have actually taken a snap-shot through one (quarter second).—I am, yours, &c., F. G. WILLATT.

101a, Fulham Palace-road, Hammersmith, London, W., July 10, 1899.

#### MACHINE PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I notice in your issue of to-day a query re machine photography. Your correspondent would get some information from Mr. Huson's little work on photogravure. The press he refers to is probably the "Arloff." If I could see my way clearly, I should like to try machine photogravure, as I have suitable premises and power and some knowledge of the matter, and, if your correspondent cares to communicate with me, I could make an appointment to discuss it with him.—I am, yours, &c., EUSTACE CALLAND.

Hillside, Putney-hill, July 9, 1899.

#### THE BLACK COLOUR OF THE RESIDUE IN ACETYLENE-GENERATORS AN INDICATION OF THE TEMPERATURE OBTAINED.

To the EDITORS.

GENTLEMEN,—Some time since I questioned the accuracy of a statement in yours—LANTERN RECORD—pointing out that such black colour is also an indication that bad carbide had been used. In proof of my statement, I forwarded a sample of black residue which I knew to be the result of bad carbide.

In yours of the 7th inst.—LANTERN RECORD—I am replied to that this sample has been submitted to Vivian B. Lewes, who states that it is a good example of the results of over-heating in the generator.

I have no hesitancy in repeating my original statement and adding that, instead of the black residue (sent sample) being due to over-heating,



it is the result of carbonaceous matter which was with the carbide at the time it was placed in the generator.

In proof of the accuracy of my statement and to question the answer of Professor Vivian B. Lewes, noted in yours of the 7th inst., I send per post herewith sample of carbide which has been in no generator, and will ask you or your correspondent, G. R. Baker, to give Professor Vivian B. Lewes the opportunity of passing this sample through any generator, and I have no doubt in anticipating the result will be a black residue, same as that on which he has expressed an opinion which I hold is not in accordance with the facts.

The proportion of this bad carbide per "drum" are matters that may follow, it is now sufficient to say, I hold it is unreasonably large—that, where it is present, users of carbide get a correspondingly small yield of acetylene and a black residue in generator, which black colour is not due to over-heating.—I am, yours, &c.,

J. V. ROBINSON.

Malahide.

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

A. F. Mowll, 45, Hardman-street, Liverpool.—Two photographs of the Right Rev. J. C. Ryle, D.D.

F. W. Wells, Station-road, Paddock Wood.—Photograph of Brenchley Church. Two photographs of Canon Taylor. Photograph of group consisting of Canon Taylor and other gentlemen. Photograph of Canon Taylor, Dr. O'Donoghue, and Father Melia.

RECEIVED.—BERGER & CO.; CONSTANT READER; AJAX; R. FRANCIS; M. M. LAHIR; and many others. In our next.

C. H. CROSBY.—Many thanks. When we have a little leisure, we hope to peruse.

M. BARNARD.—We do not think the photograph could be restored, or that any photographer would attempt to do so. The photograph has been returned to you.

A. L.—Your complaint is, probably, well founded, as we have heard similar ones; but, as you will not attest your communication with your name and address, it cannot be inserted.

TAXATION OF VEHICLE.—R. C. P. If the vehicle is used exclusively for business purposes, it is exempt from taxation; but if it is used, if only occasionally, for other purposes, a tax must be paid upon it. Under the circumstances, we suspect the appeal will not be very successful.

TENANCY.—TENANT. If the three years' agreement ends in September next, you must vacate the premises, unless you renew the agreement to continue the tenancy. The landlord is not bound to serve you with a notice to quit. The tenancy simply terminates at the end of the term.

MOUNTING CARBON PICTURES.—T. BUSS asks the best medium with which to mount large carbon prints on rather thick paper?—Nothing is better than starch paste, made tolerably thick. The paste is best applied with a sponge, as it breaks up the starch better than a brush does when a large surface has to be coated.

BLOTTER-OFF PRINTS.—L. OSBORNE. 1. Albumen and collodio-chloride prints may be dried, under pressure, between blotting-paper without fear of their sticking; but not so with the gelatine P.O.P. papers, as your experience proves. 2. Get pure and inert blotting-paper or blotting boards. Both may be had from Messrs. Marion & Co., and other large houses.

HAND-CAMERA QUERY.—W. BERRY. We doubt if you will be very successful in developing the plates so as to get good negatives. Ordinary plates, exposed with an aperture of  $f/22$ , with a shutter working at the forty-fifth of a second, unless they are exposed in an exceptionally good light, must be expected to prove under-exposed. The developer tried will bring out as much detail as any we know.

USE OF STILL-PURE WATER writes: "I want some pure distilled water for making toning baths and other purposes; but I am told that, if I distil it myself, I require a licence from the Excise to use a still. As I only want it for distilling water, is this correct?"—Yes. A licence from the Excise is necessary to use a still for any purpose, even for distilling water. The cost, however, is not great, only ten shillings a year, we think, if it is not used for spirit.

DEVELOPING P.O.P.—G. BAILEY. The commercial gelatino-chloride printing-out papers are not specially prepared for development printing, though they may sometimes be used for the purpose. It is manifest that any paper that is to be developed must be more carefully handled during its manipulations, as regards light, than when it is printed out. The light that is permissible for examining the progress of printing in the latter case would be quite fatal in the former.

RESTORING PAPIER-MACHÉ ACCESSORIES.—FLASHLIGHT says: "I have several papier-maché accessories with portions damaged. Can you give a recipe for making pulp, so that I can restore them? Fallowfield, several years ago, gave a good recipe made of soft paper, flour, alum, and water, but I have forgotten the quantities."—The proportions need not be very exact, so long as there is sufficient flour-paste to make the compound adhesive. If, however, you write to Fallowfield, they will doubtless give you the precise quantities they recommended.

PATENT.—NERO says: "Some year or so ago I described to a friend an idea I had for an improved hand camera, and he thought much of it at the time. Since then I know he has been making a hand camera, and has applied for a patent for it, and the application has been granted. I have reason to believe it is the same as I described to him. If it is so, have I any remedy?"—Yes. Wait till the complete specification is published, and, if it is as you surmise, oppose the sealing of the patent on the ground that he obtained the invention from you. He will, doubtless, then be glad to make terms with you.

TESTING ALUM.—A. R. S. says: "Will you kindly test the alum herewith. After carefully searching out the cause of spots on prints herewith, we find that they first show themselves after coming out of alum bath. We had this alum from a chemist. I may say we have never had any spots like this through using other people's alum."—In reply: We do not undertake such matters as the testing of chemical compounds. If the alum is at fault, you had better reject it. In the event of your requiring an analysis, you had better address Mr. Thomas Bolas, of 60, Grove Park-terrace, Chiswick. Of course, you would have to pay a fee.

COLOURING PLATINUM PRINTS.—ALFRED FRISKE says: "Some few months ago I had occasion to put a scarlet coat on a platinum print, and it has gone dark. Can you tell me if there is anything between this colour and the print that does not agree? I have used the same colour on carbons years ago, and they remain quite good."—Evidently there is, but we do not know the composition of the colours that were employed. Vermilion is a sulphide of mercury, but we do not imagine that the platinum image pure and simple would have any effect upon that. The case may, however, be different if the paper contained any of the iron compound or the acid used to remove it.

LENS FOR HAND CAMERA.—T. BLAGDEN says: "I want a lens for a quarter-plate hand camera for a special purpose. It must have a working aperture of not less than  $f/5.6$  included, an angle of  $80^\circ$ , and give all objects beyond six feet microscopically defined, as the negatives will have to be enlarged six or eight diameters. The lens must be used with its full opening. Whose make do you recommend?"—It is against our rule to recommend any particular maker's goods. We may say, however, that the qualifications laid down are quite incompatible with each other. There is no lens in the market that will fulfil the conditions named, nor is there likely to be with our present knowledge of optics.

TRANSFERRING COLLODION FILM.—F. J. says: "Would you kindly inform me if it is possible to transfer a collodion film (negative) from the glass support on to canvas? If so, how to do it? I do not think it can be done, but I am told it is possible. I am well up in the wet-plate process, but never heard of the film being transferred on to canvas."—It is possible, with some practice, to transfer the film to canvas, primed as it is used by artists. It may be done in the following way: The glass plate upon which the picture is made is treated with French chalk or waxed; the canvas is given a coating of gelatine and allowed to dry. The picture, when dry, together with the canvas, are immersed in a thin solution of gelatine, and carefully squeezed together and allowed to dry. The picture can then be stripped off. As we have just intimated, some practice is necessary, particularly with large sizes, to ensure success.

LENS QUERY.—J. L. says: "I should take it as a favour if you could give me a little information. I have an old portrait lens without the back-glass, and would like to know whether I could get a back glass, also the likely cost of same. The front is of meniscus form, two glasses cemented together of about  $8\frac{1}{2}$  inches focus covering half plate to perfection. The mount has rack-and-pinion movement, but without stops, I have tried another lens in the back similar to the front, but can only get a picture 2 inches by 2 inches. Any information you can give me on the subject will be greatly appreciated!"—The maker of the lens will fit it with a suitable back combination. We cannot say the cost. As the front combination is  $8\frac{1}{2}$  inches focus, and the mount is not fitted with stops, we assume it is an antiquated quarter-plate portrait lens. If so, the cost of the back lens will be more than the instrument will be worth when completed. Second-hand quarter-plate lenses are only worth a few shillings each in the market.

STEREOSCOPIC NEGATIVES.—R. WARDEN writes: "1. I have an idea of going in for stereoscopic photography. I am undecided what size plate to adopt. The choice seems to be between the old  $6\frac{3}{4} \times 3\frac{1}{4}$  and the double quarter  $6\frac{3}{4} \times 4\frac{1}{4}$ , but I find that neither of these sizes are stocked at several dealers I have inquired of, of my favourite brand. If I get a camera of the  $6\frac{3}{4} \times 4\frac{1}{4}$  size, could I not use two quarter-plates, which are to be had anywhere, in it? 2. Is there any magazine stereoscopic camera on sale that will take two quarter-plates for stereoscopic work?"—In reply: 1. Yes; but there is the difficulty in developing two separate negatives to exactly the same density. This, however, is not a serious difficulty seeing that a trifling difference in the two halves of the picture is not very apparent when the finished result is seen in the stereoscope. 2. The only apparatus of the kind that we call to mind is that of N. Richard, of Paris—agents, Negretti & Zambra; but whether that takes plates of the standard English quarter-plate size we are not sure. We think not.

\* \* Owing to our absence at the Convention this week, many communications have had to be held over.



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## EX CATHEDRA

THE Gloucester Convention is an event of the past. All the contributing circumstances operated to bring about a remarkable success. The charming weather, the beautiful scenic, historical, and architectural surroundings of which Gloucester is the centre, combined to give the Conventioners every chance of passing an enjoyable week in the practice of photography, for which it is safe to say they have not hitherto found such favourable opportunities. From the people of Gloucester, headed by the Mayor and Corporation, the greatest kindness and courtesy were experienced during the week, and to them the heartiest acknowledgments of the whole of the Convention are due. The thanks of the members which are recorded in our report of the proceedings elsewhere only faintly testify to the gratitude entertained for Mr. F. A. Bridge (Hon. Secretary); Mr. Dugdale (Local Hon. Secretary); and the other members of the Local Committee for the hard and ungrudging work they performed during the week, and thus, all round, the recollections of the Gloucester meeting of the Convention are of the happiest character.

ON Monday last the Select Committee of the House of Lords, charged with consideration of the Copyright Bill and Copyright (Artistic) Bill, held another sitting, Lord Monkswell presiding. Mr. Edward Cutler, Q.C., who has been deputed by the Board of Trade to make a report on the Artistic Copyright Bill, gave evidence regarding its various provisions. He pointed out that if they gave photographs, say of a picture, a shorter term of copyright than the term of the original picture—which was proposed in the Bill—they would come in conflict with the second article of the supplementary clauses of the Berne Convention. In other words, if they adhered to the proposal to give a shorter term to photographs in order to carry out the Berne Convention, they must give the foreigner a longer term than the native Briton. That would call forth considerable comment, and showed want of uniformity. With regard to the clause dealing with registration of works of art in order to secure copyright, he suggested an alteration bringing the clause into harmony with the clause requiring an assignment to be in writing.

\* \* \*

A CORRESPONDENT informs us that the Swiss Photographic Society have petitioned their Government to alter the Copyright Act of 1883, and what is more, they have every reason to believe that the Swiss law will be altered in their favour. "Petition: § 1. It is no longer necessary to register the photograph, but the photographer shall make a register containing all photographic negatives, indicating the date of taking, and this register shall be acknowledged by law for the whole time of the duration of protection. § 2. The duration of protection shall be thirty years, and begin on January 1 of the year in which the negative was taken."

\* \* \*

IN OUR News and Notes last week we gave an extract from the *American Journal of Photography*, in which Mr. Hahn suggests that some of its readers would do well to experiment with some of the old printing processes, so as to make them available by the light shed upon them by modern photography. In doing this the writer re-echoes what we have more than once advised. Some of these old processes, if experimented with, *plus* our modern knowledge of the chemistry of the subject, might, no doubt, be turned to profitable account; any how the results would be interesting, if



nothing more. The ferro-prussiate, or blue process, with its many modifications, which is now so largely used, was described by Sir John Herschell nearly sixty years ago. The platinotype, one of the most generally used processes of the present day, is closely allied to another old process of Herschell's. One of the processes described by Mr. Hahn is what was known as the Catalysotype process of Dr. Wood. Amongst these old processes were what were known as the "Chrysotyp," "Amphityp," "Chromatyp," "Ferrotyp," "Fluorotyp," "Energiatyp," &c. Some of these printing methods were sensitive enough for camera exposures. Most of these old processes are described, with formulæ and working details, in Hunt's *Manual of Photography*, which went through several editions in the "fifties," and which, though long since out of print, may often be met with at second-hand bookshops for a trifling sum. It is also to be found in most photographic libraries. Photographic societies are often hardly pressed for subjects, hence we again suggest the overhauling of some of these forgotten processes, with modern ideas upon them, as food for experiment and discussion.

\* \* \*

THE Oberammergau Passion Play has been frequently photographed. This year it has been cinematographed, and the results, through the enterprise of the Royal Aquarium management, are now being shown in the St. Stephen's Hall. Londoners now have the opportunity of seeing what this play is like without having to pay a visit next year to the highlands of Bavaria to see for themselves, and whether it is worth the journey, if for that purpose alone. We are told from Berlin that the Sultan has long had a passion for the cinematograph, and has now determined to turn it to practical use. He wishes to see, without the trouble of travelling, the working of the Anatolian Railway, and has given orders to a cinematograph specialist to prepare, regardless of cost, a series of pictures covering 1100 kilometres of the line. These pictures are to be shown to him, when done, in the Imperial Theatre at Yildiz Kiosk. This is rather a large order for the cinematographer, and we know some who would have liked to have had the job, particularly as it is to be done "regardless of cost."

\* \* \*

OUR readers will, doubtless, remember the hue and cry there was, on the part of artists and archaeologists, some time ago when it was first proposed to pull down the west front of Peterborough Cathedral, and to rebuild it, for the safety of the structure. As we pointed out at the time that there were plenty of photographs of it in existence that would show whether or not the architects had despoiled the building to the extent it was alleged they would by making the structure safe and stable. Since the work has been practically finished, we have heard little on the subject, so we may safely conclude that it has been done fairly to their satisfaction. Last Friday, in the presence of the Dean and the representatives of the Restoration Committee, the high cross on the southern gable—the crowning point of the completion of the principal restoration of the huge façade—was placed in position. The work of restoration has been in progress for about fifteen years, and has cost something like 80,000*l.*, which has principally been expended on ensuring the safety of the building. To most persons a fine cathedral presents a better appearance in a stable condition than it does in ruins, and, as we have just said, photographs of the west front taken now will show,

when compared with those taken before the "desecration was commenced, how much the original design has been de-parted from, if at all.

\* \* \*

A QUESTION was put in the House of Commons on Friday last as to whether Buckingham Palace, with its art treasures, could not be made available to the public? In reply thereto, Mr. Akers Douglas said that the objections to the opening of the Palace to the public were that it is unsuitable, from internal arrangements, for exhibition, and it is almost continually occupied by members of Her Majesty's family, adding that the Queen has given every possible facility to the public to view Windsor and other Royal palaces, and that he was not prepared to ask Her Majesty to make any concession in regard to Buckingham Palace. It is tolerably well known that the collection of paintings at Buckingham Palace is far better than that at Windsor, as the fine photographic reproductions of them by the houses of Hanfstaengl, of Munich, and Braun, of Dornach, testify. The Queen possesses some of the finest Vandyks in this country. By the way, speaking of pictures by Vandyk, we see, by the judgment delivered on Saturday in the case of the sale of some of the Peel heirlooms, that Mr. Justice Byrne directed the sale of two Vandyk pictures. It will be interesting to note who will be the purchaser of them, and, when sold, whether they will remain in this country. A large proportion of the old masters when they are sold here find their way ultimately abroad—frequently to America. Will it be so in this instance?

\* \* \*

WHILE on the subject of art matters, it may be mentioned that the Turner Exhibition at the Guildhall has closed its doors. In the few weeks it was opened it was visited by nearly 225,000 people. This shows how art is now appreciated even in the busy city of London. The Court of Common Council will shortly be asked to authorise the holding of another Art Exhibition next year, and there is little doubt that these loan exhibitions will be a fixed annual institution.

\* \* \*

A FINE-ART and Industrial Exhibition is announced to be opened in November next at Newark-on-Trent by the Duchess of Portland. The schedule of classes for exhibits includes a Section H, devoted to photography. Mr. Bliss, photographer, Newark, will forward full particulars to those interested upon application.

\* \* \*

It is a regrettable thing in connexion with photography that it can be used for persecution in so many ways. Last week we alluded to the way in which Madame Dreyfus was persecuted by the ubiquitous photographer and cinematographer, when visiting her unfortunate husband in the Rennes prison. Now it appears, according to the correspondent of the *Standard*, some enterprising photographers having been able to take, from the roof of a neighbouring house, snap-shots of the prisoner whilst walking in the garden, but this has now been covered in with a large awning in order to prevent further indiscretions—and very right too, say we. It will be remembered that, when this unfortunate man was first convicted of an offence of which most people out of France thought him not guilty, or at least not proved guilty of, and of which now a large majority in France believe him innocent, he was degraded in front of the



soldiers, and, after his stripes had been torn off, photographed. This photograph has since been shown publicly in London. At the time the sentence was passed and the photograph taken, we mentioned that it was the first time that photography had been used for such a purpose of degradation, and we now hope, for the credit of the art, it will be the last, when applied to such purposes.

\* \* \*

AMONG the visitors to the Gloucester Convention was Mr. F. Dundas Todd, the editor of the *Photo Beacon* (Chicago), who, after an absence of seven years in America, has returned to Britain for a brief holiday, which we trust will be a pleasant one. Mr. Todd tells us that American Conventions are conducted far more spiritedly than our own, and that great features are made of the elements of professional photography and manufacturing interests at those gatherings. Notwithstanding these drawbacks (if drawbacks they are), we believe that Mr. Todd, on his return to the States, will be able to tell his American brethren that the British Convention could hardly be excelled in point of enjoyment and good fellowship.

\* \* \*

AT Rome next year the principal photographic society purposes holding an International Exhibition on lines similar to those upon which the recent successful Exhibition at Florence was conducted. It will be recollected that at the latter Exhibition an Invitation Section of British pictorial photography was one of the features most appreciated by the visitors. It is proposed to repeat the experiment at Rome, and invitations will shortly be issued to the principal exhibitors.

### TONING TROUBLES.

WHAT Mr. Burton aptly describes as the battle of the toning baths still occupies the arena, and from reports received of the proceedings of the various photographic societies, and numerous queries and letters from our correspondents, it is abundantly evident that the subject of toning, whether with platinum or gold, still presents many difficulties and uncertainties. A few months ago we dealt exhaustively with the subject of toning baths, contrasting the ancient with the modern methods employed, and pointed out the causes which rendered changes necessary, and which made the older forms of toning unsuitable for the new and modern papers. A few further words confined to the causes of failure with modern makes of commercial papers might prove instructive to the large number who still meet with occasional difficulties and failure. As we previously pointed out, the principal difference between the albumenised or salted papers of the past and the gelatino-chloride of the present day consists in the comparatively small quantity of silver chloride and of silver nitrate in the uncombined state which exists in the latter as compared with the former. Again, there is the difference that the old papers were salted and sensitised by floating on a solution, whilst the modern papers are surface-coated with an emulsion consisting of silver chloride and an organic salt of silver instead of the free nitrate.

First, let us consider how gold acts upon the reduced silver in the print. It is, perhaps, as well to point out that the chloride of gold of commerce should properly be called auric acid, since its formula is  $\text{AuCl}_3\text{HCl}$ , or, more properly,  $\text{HAuCl}_4$ , by which it will be seen that for each atom of gold deposited upon the print three atoms of chlorine are set free, and in its

nascent condition unites with three atoms of the reduced silver of the printed image, reconverts it into silver chloride, and thus, in a large measure, undoing what the light has done. To prevent this, the addition of some salt, the acid of which is capable of being easily displaced by chlorine, is necessary. Hence the function of soda acetate, phosphate, or tungstate as employed in ordinary toning baths, is, first, to neutralise the  $\text{HCl}$  molecule of the gold chloride; and, second, to absorb or combine with the liberated chlorine as the gold is deposited, thus preventing, in a great measure, the bleaching of the print.

It will be familiar to most photographic printers that with most of these baths the orthodox method was to mix at least twelve hours before using. The reason for this was because the  $\text{HCl}$  molecule of the auric acid is not immediately displaced by a neutral solution of an acetate or phosphate requiring some hours for completion. By carefully neutralising with a solution of carbonate of soda previous to mixing, however, this time was saved, and an acetate or other similar toning bath might be used at once. This method of toning was satisfactory with albumenised papers of all kinds, and with collodio-chloride or matt papers; but, with the advent of gelatine as a vehicle for containing the emulsion for surfacing the paper, fresh and new troubles were introduced. Old and tried formulæ refused to act. Either the prints would not tone at all, or toned very unevenly. Usually the fainter half-tones and lighter-printed portions toned rapidly to a cold blue, whilst the deep shadows remained red, and the so-called double toning took place.

We invariably hold as a maxim that, when the cause of any trouble is clearly understood, the remedy is obvious and the difficulty disappears. In this case the reason is of a twofold character. That this may be clearly understood, let us examine the action of gold chloride on gelatine. If we dissolve a few grains of gelatine in water, say, in a test tube, and add a few drops of the stock solution of gold chloride, the gelatine is at once gelatinised and becomes insoluble. Again, take a strip of dried gelatine and immerse in a solution of gold chloride, and no amount of after-washing will remove the gold, nor will boiling water dissolve the gelatine. The two have entered into some form of chemical combination, and an absolutely insoluble product is the result, just as if an excess of formalin had been added. It is easy to see, then, that with a gold-chloride toning bath and a gelatine-surface print this combination will take place over the whole surface of the print, and the toning bath be robbed of its gold. Another factor of a different kind also comes into force, and is even more the cause of double tones than the one we have referred to. In albumenised papers the sensitising salt was usually the free nitrate of silver, with citric or other organic acid as a preservative. This, being soluble in water, was easily eliminated in the washing previous to toning; but in gelatine papers the whole of the silver nitrate is converted into the nearly insoluble organic salts of silver such as citrate or tartrate, and this, being intimately bound up within the gelatine of the film, is almost impossible of removal by washing. Returning now to another reaction of gold chloride, that upon salts of silver. If we take a solution of auric chloride and add to it carefully an exact equivalent of silver nitrate, we obtain a precipitate consisting of a mixture of aurous and argentic chloride. Two of the three atoms of chlorine go to form silver chloride, and the gold is reduced to the insoluble aurous state, or  $\text{AuCl}$ . This aurous chloride is exceedingly unstable, and easily suffers reduction to the metallic state, consequently toning takes place rapidly



to the blue stage; but for reasons which we will now point out this is a decided disadvantage.

As was previously stated, the unexposed paper consists of a uniform and homogeneous mixture of silver chloride and silver citrate, or other organic salt; but, when exposed and fully printed, this condition no longer exists. As the printing of the image progresses, the chlorine eliminated by the action of light from the silver chloride unites with the organic silver salt, to form further amount of silver chloride, which is itself again darkened, and so on until the necessary depth and vigour is obtained. It will be readily seen, therefore, that in the fully printed proof the whole of the free salt of silver may be used up in the deepest shadows, whilst the half-tones and lighter tints still contain a considerable quantity, and the whites the whole amount originally in the paper. If, now, this silver salt is not removed, or is insufficiently removed, and a toning bath containing gold chloride be employed, the above reaction at once takes place, as precisely the same change takes place in the gold, whether organic or nitrate of silver be used. The gold chloride of the toning bath is precipitated as silver aurous chloride, not only on the partially printed portions, but in still larger quantities over the white or unexposed parts, whilst the shadows, which really require the most, receive the least. At the same time, the toning bath is robbed of its gold, and rapidly becomes useless. The deduction from these facts is obvious: First, gold chloride is unsuitable for toning gelatine prints; and, second, we see the necessity of taking adequate measures for the total removal of the organic salts of silver previous to placing in the toning bath.

The first of these objects is satisfactorily attained by the use of gold sulphocyanide instead of the chloride. When gold chloride in solution is added to ammonium sulphocyanide solution, a deep red precipitate is first formed of gold sulphocyanide, and ammonium chloride remains in solution. On the application of a gentle heat this precipitate dissolves first as a red and then a colourless solution. This gold solution no longer combines with gelatine, and will mix freely with a solution of it without any apparent disturbance taking place.

The second object is attained by a preliminary bath of salt and water, which converts the whole of the citrate and tartrate into chloride of silver. A further wash in one or two changes of water now removes the resulting soda citrate or tartrate, and uniform, even toning is the result. The double salt of hyposulphite of soda and gold may be substituted for the corresponding sulphocyanide salt, and is, in fact, the active toning agent in what is termed the combined bath. But space forbids to go further into the subject at present. On this latter point we may have something to say at a future date.

**Cloud Photographs.**—Photographs of clouds have a use beyond that of serving as adjuncts to cloudless negatives of land or seascape subjects, as may be seen by a reference to the *Monthly Weather Review* for February last, in which there is to be found a set of photographs taken by Mr. Alfred J. Henry, of the United States Weather Bureau. Naturally, when a photographer takes a cloud picture, it is usually for the purpose referred to by us; but, in these particular photographs, when the camera has once been set to work, the operator is not content with a pretty picture, he takes a series of successive pictures, thus obtaining data of the production, alterations, and dissipations of clouds of a particular class. Then, again, by virtue of previous arrangements, the same clouds can be

photographed from other stations at considerable distances apart, and thus negatives can be secured of the same masses of clouds from different standpoints.

**Novel Use for the Kinematograph.**—Reports are given of a very remarkable use to which the kinematograph has been put before a select assembly in the University of Kiel, there being present the Prince of Monaco, Professor Von Esmarch, the famous surgeon, and numerous professors, doctors, and medical students. M. Doyen, who had charge of the experiments, explained that it was not possible verbally to describe the performance of an experiment in such a manner as to make it impossible to avoid error in carrying it out by one who had not actually seen it performed. M. Doyen, by means of certain alterations in the kinematograph, has been able to make a perfect series of pictures of various kinds of operations, from the first cut of the knife to the putting on of the bandages. Every phase of the operations was thrown on the screen with marvellous accuracy. M. Doyen insists that his invention will be of incalculable benefit to students of surgery. He received an ovation from the medical students who witnessed the experiment.

**Stereoscopic Röntgen Rays.**—At the Royal Society's second, or Ladies', *Conversazione* were several exhibits of interest to photographers, among them an arrangement by Mackenzie Davidson for giving a stereoscopic effect in X-ray investigation. Under ordinary conditions, as is well known, the effect produced is merely like a "shadow on the blind," a foreign object being shown apparently on the same plane as objects in front of or behind it. Mr. Davidson so arranges a rapidly rotating disc, with two apertures cut in it, and so rotates it, that each eye only receives the rays from the source of light opposite to itself, and never receives them at exactly the same moment that the other eye is receiving its rays. In the same way a Röntgen-ray image cast on the fluorescent screen is only seen by one eye and the image cast by the other source of light is only visible to the other eye. If these succeed one another fast enough, faster than ten times a second, the impressions are naturally apparently continuous owing to the effect of "persistence of vision," and thus the two images will coalesce as in a stereoscope.

**Diffraction Gratings and Colour Photographs.**—Another exhibit of great interest was that of Mr. R. W. Wood (whose method of colour photography was explained in our issue of July 7) and exhibited by Professor C. Vernon Boys, F.R.S. It included a silvered photographic grating. The grating shown was on silver, and one of 2000 lines to an inch was a contact print on albumen, which was afterwards silvered and polished while wet. The spectrum obtained by its aid is of great brilliancy. There was shown a diffraction colour photograph produced in the manner described in the article referred to.

**The New Electrolytic Interrupter.**—Mr. A. Campbell Swinton, at the *Conversazione*, showed experiments with various electrolytic contact-breakers. Mr. J. W. Swan, F.R.S., showed effects produced by the action of modifications of the Wehnelt-Coldwell mercury interrupter. An article by Mr. Campbell Swinton appears in *Nature* of July 7, describing a modification of the latter instrument, which now appears to be brought to a state of absolute perfection and will, where electric current of high potential is available, almost revolutionise work with the intensity coil and Crookes tube. The new break has several points of advantage over the original design. It can be used with alternating currents equally well as with continuous; it does not appear to be liable to "fatigue;" and it is capable of a simple and easy control over the ampérage and frequency of the break, while still being of so simple a design that any one at all conversant with laboratory work could with ease construct one himself without calling in the aid of an expert.



## PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

GLOUCESTER MEETING, JULY 10-15.

At the Tuesday evening meeting the following paper was read by the author:—

### SOME FUNDAMENTAL POINTS CONCERNING DEVELOPMENT

In a preliminary paper on "Development," read before the Convention last year, I gave an abstract of the position of the question at that time, and in particular pointed out that the definition of a perfect negative given by Hurter & Driffield could not be accepted, because, in the first place, experienced photographers are aware that a negative that gives the best possible results with one printing process does not necessarily give the best possible result with every other process; and, in the second place, the assumption that a perfect negative must in its different parts transmit quantities of light proportional to the quantities of light reflected from those portions of the object that the particular parts represent involves a further assumption that the effect on the printing paper is directly proportional to the amount of light acting. This latter assumption probably holds good, within certain limits, in the case of enlarging on bromide paper, or in other printing processes in which the action of light causes no appreciable change in colour. It does not, however, hold good, and, on the face of it, could not be expected to hold good, in direct-printing processes where the action of the light at once begins to alter the absorption coefficient and other properties of the sensitive material.

In order to make clear the object of the, unfortunately, comparatively few experiments that I am now in a position to describe, it is necessary to recapitulate a little ancient photographic history. Until the publication of Hurter & Driffield's first paper, photographers generally held the belief that it is possible to modify the general character of a negative, especially the gradations, by altering the mode of development and the composition of the developer, and thus, to some extent, to compensate for errors in exposure and more particularly for over-exposure. This belief had gradually been developed as a result of the observations and experience of a large number of photographers, who for many years had made experiments and recorded their results, although in most cases they had not, it is true, tried to express their results in very definite figures. Now, I, for one, must confess to holding somewhat strongly the view that, when certain general conclusions have been arrived at as the accumulated experience of the practical workers in any branch of applied science or art, any contrary conclusions that may be deduced from the results of laboratory experiments should be examined very critically before being enunciated, and should be enunciated with considerable reserve.

In their first paper Hurter & Driffield arrived at two main results as the outcome of that part of their work that dealt with development. The first was that the character of a negative is determined by exposure, and not by development, and that the ratios of the densities or opacities is not affected by the mode of development. The second was that the ratio of the opacities remains the same at each stage of development, and that the only control that the photographer is able to exert on the printing quality of a negative lies in the length of time during which development is allowed to continue.

At the time of the last Convention, a second and lengthy paper, communicated by Hurter & Driffield to the Royal Photographic Society, was in process of publication, and every one who has read this paper will recognise that it materially changes the position in which the matter was left by their first paper.

The most important result in the second paper is that Hurter & Driffield, whilst they still regard exposure and not development as the main factor in determining the character of a negative, and whilst they regard the constancy of the density ratios as the fundamental point in quantitative photography, nevertheless, as the result of their later experiments, arrive at the conclusion "that, if all possible variations in concentration and in composition of developing solutions are to be taken into consideration, the density ratios of the visible image cannot be said to be constant."

They describe in detail, with diagrams and numerical results, experiments on the influence of variations in the proportions of pyrogallol, sodium carbonate, and potassium bromide respectively in the ordinary pyro-soda developer, on what they term the "inertia" of the plate. The practical significance of saying that the inertia is increased is that the result is the same as if the plate had been a slower one or had

received less exposure. Conversely, if it is said that the inertia is reduced, the meaning is that the resulting negative is the same as it would have been if the plate had been a quicker one or had received more exposure. To put it in another way, to increase the apparent inertia of the plate by modifying the developer is practically the same thing as correcting over-exposure, whilst to reduce the apparent inertia of the plate in the same sort of way is the same thing as correcting under-exposure.

Now, Hurter & Driffield find that, by increasing the proportion of pyrogallol, the sodium carbonate remaining constant, the inertia can be increased more than twice, or, from the practical point of view, more than twice. The proper exposure can be corrected in this way. The effect of increasing the pyro is higher when the proportion of sodium carbonate is low (25 parts of the crystallised carbonate in 1000) than when it is high (100 parts of the crystallised carbonate in 1000 of developer).

They also find that, by increasing the proportion of potassium bromide up to 8 parts in 1000 in the ferrous-oxalate developer, the inertia of the plates can be increased as much as thirteen times, or in the pyro-soda developer as much as eleven times; or, stating it practically, that more than ten times the proper exposure can be corrected by this means alone.

They state, it is true, that these differences disappear if the development of the plate is allowed to reach its limit, that is, is allowed to go on until the whole of the effect of light has been developed out, and are apparent only when development is stopped before this limit is reached. It is obvious, however, that, when a photographer is endeavouring to correct for over-exposure, his object is to prevent the whole of the light effect from being developed, and to stop development before the limit is reached is therefore exactly what he is aiming at.

Further, Hurter & Driffield find that an increase in the proportion of sodium carbonate reduces the inertia of the plate, that is, corrects for under-exposure, but the effect is relatively smaller than the effect in the opposite direction of increasing the proportion of pyrogallol or potassium bromide. In other words, the power of correcting for under-exposure is considerably less than that of correcting for over-exposure.

It will be seen at once that Hurter & Driffield's second paper may fairly be said to bring us back to where we were before, and to afford numerical justification for the older beliefs of practical photographers. It is impossible to avoid feeling regret that their earlier somewhat sweeping conclusions as to the absence of any control during development for errors of exposures should have been enunciated at all until their investigations had covered a wider range of variations in the composition of the developer. Even as it is, their second paper does not entirely cover the limits within which a photographer has power to make variations, and does, in fact, make variations in extreme cases.

Since Hurter & Driffield, so far as control in development is concerned, to a large extent contradict their first paper, and bring us back very much to the old conditions, it might seem that there was nothing further to be done. However, as the old beliefs have been disturbed, and various questions have been raised, it seems very desirable that the same field of observation and experiment should be traversed by some other observer.

There is also another consideration which, from the practical point of view, seems to me to be very important. In their second paper Hurter and Driffield state that the error of speed determinations by the methods described in their first paper may be as much as twenty-five or thirty per cent. Some years ago, in the course of the discussion on a paper of mine at the Royal Photographic Society, two of the most experienced photographers then living stated that they did not think it was possible to recognise in the negative and resulting print a difference of twenty-five per cent. in the exposure under ordinary working conditions.

From the practical point of view, differences that cannot be recognised by careful inspection may fairly be regarded as of little importance; from a scientific point of view they may be very significant.

From the practical point of view it seems to me to be sufficient to adopt a method of working that does not require a photometer, and is in other respects comparatively simple. All that is needed is a scale composed of bands of graduated opacities, such as may be produced by the old method of exposing different strips of one and the same plate for different lengths of time, and then developing it. This scale is then used for subsequent experiments, plates being exposed behind it in the ordinary way. After exposure the exposed plate is cut into two or four strips, and each strip is developed in a different way. In order to compare the fixed and dried strips they are simply placed together in their original positions, and examined against a sheet of white paper or other uniformly illuminated



surface. If no differences can be detected in this way, or if the differences seem to be merely differences in general opacity, the strips should next be put into a printing frame, with a sheet of some chosen printing paper behind, and in this way a direct comparison of their printing quality can be made.

With regard to the point at which development should be stopped, in the case of the negatives ordinary working conditions should be imitated as far as possible, and therefore, in most of the experiments to which I shall refer, the plan adopted was to stop development as soon as a given strip of the scale, representing shadow detail, had become distinctly visible.

In the case of prints, we may stop either when two successive bands on the scale, representing shadow detail, have become equally dark, or when a certain band at the other end of the scale, representing high-light detail, just becomes visible.

Operating in this way, it is comparatively easy to demonstrate that the general belief as to the effects of altering the proportions of pyrogallol and of alkali respectively is correct, and that Hurter & Driffield's conclusions on these points are also correct. In the case of bromide, it is quite easy to demonstrate the marked effect on the negative, and with a new developer, adurol, it is even easier than with pyro. It is also not difficult to demonstrate the marked differences between the negatives produced by pyrogallol and metol respectively, especially in the early stages of development, and also to demonstrate the equally important fact that these differences tend to disappear when development is allowed to proceed to its limit.

The present position consequently may be briefly stated as follows: With a given exposure, a photographer has control over the character of his negative in two ways: firstly, by varying the proportions of the constituents of his developer in accordance with the general belief resulting from accumulated experience; and, secondly, by selecting his developer, the results with metol and pyrogallol, for example, being markedly different.

Another point to which I have given some attention is that investigated by Mr. Watkins, namely, whether there is a constant ratio between the time required for development and that which elapses between the pouring of the developer over the plate and the first appearance of the image. The experiments are not yet complete, but, so far as I have gone at present, I am able to confirm Mr. Watkins' main conclusions within certain rather important limits. Where the exposure has been fairly accurate, or where we are dealing with line subjects or similar classes of work, the method seems to have very considerable utility. Where, however, there has been any considerable excess of exposure, my experiments up to the present lead me to the conclusion that the old method of inspection of the negative during development is the only safe one, and that development by time passes beyond its proper limits. So far as detail in the shadows is concerned, the different negatives do not show any marked difference when the developing factor is employed, but I find that at the other end of the scale there is a marked loss of detail in the high lights, the different bands of the scale tending to become indistinguishable from one another in all cases where the exposure has not been so great as to bring about incipient reversal.

At present I am inclined to the view that it is impracticable to reduce development to a matter of figures; the operator must watch the progress of the process if he wants to get particular results. Development, in fact, is an art.

C. H. BOTHAMLEY.

#### ANNUAL MEETING.

THE Annual General Meeting and election of the new Council was held at the Guildhall, on Wednesday morning. The President (Mr. W. Crooke) occupied the chair, and there were about twenty-five members present. The election of the Council resulted as follows:—

Harold Baker, Birmingham.	H. M. Hastings, London.
W. Barry, Hull.	A. Horsley Hinton, London.
R. Child Bayley, London.	W. Hodges, Gloucester.
Thomas Bedding, London.	E. J. Humphery, London.
Godfrey Bingley, Leeds.	Sydney Keith, London.
C. H. Bothamley, Weston-super-Mare.	C. Phipps Lucas, London.
Dr. Oscar W. Clark, Gloucester.	Percy Lund, Bradford.
Alexander Cowan, London.	J. L. Lyell, London.
H. S. Crump, Gloucester.	Major Lysaght, Chichester.
T. B. Dallmeyer, London.	George Mason, Glasgow.
Dr. P. H. Emerson, Lowestoft.	H. Medland, Gloucester.
A. Haddon, London.	J. Porritt, Leicester.
Martin J. Harding, Shrewsbury.	Ralph Robinson, Redhill.
	H. P. Robinson, Tunbridge Wells.

J. C. Ruthven, Dublin.  
A. Seaman, Chesterfield.  
W. Taylor, Leicester.  
Alexander Tate, Belfast.  
J. Stuart, Glasgow.  
E. J. Wall, London.  
J. H. Walker, Leeds.

H. Snowden Ward, London.  
S. B. Webber, London.  
G. Watmough Webster, Chester.  
W. D. Welford, London.  
J. B. B. Wellington, Elstree.  
A. Werner, Dublin.

Messrs. H. Harvey George (Great Yarmouth), William Goodwin (Glasgow), and B. W. Dugdale (Gloucester) are *ex-officio* members of the Council for one, two, and three years respectively.

Mr. F. A. Bridge introduced the subject of alterations or additions to certain rules, which were agreed to as follows:—"That if a member elected on the Council has not paid his annual subscription (5s.) before August 1, his seat on the Council shall be vacant." "That the election of Hon. Secretary shall take place at the first Council meeting held in London after the Convention." It was also resolved that past presidents (vice-presidents) shall be *ex-officio* members of the Council.

With reference to next year's meeting of the Convention, it was unanimously decided to accept the Newcastle and Northern Counties Photographic Association's invitation to meet at Newcastle.

Messrs. Fall and Fry were appointed Auditors.

On the motion of Mr. Bridge, a hearty vote of thanks was accorded to Mr. Dugdale (Hon. Secretary) and the Local Committee of the Gloucestershire Photographic Society for the enthusiasm they had displayed and for the efficiency and assiduity with which they had carried out the arrangements for the Convention. Mr. Dugdale and Mr. Medland briefly acknowledged the vote.

After the meeting the members adjourned to the Spa Cricket Field where the official Convention group was taken by Mr. A. H. Pitcher.

In the afternoon a visit was paid to the Cathedral, where the members were met by the Dean, who conducted them over the building, and gave an account of some of the more important historical and archaeological features of this ancient structure. Subsequently Mr. F. W. Waller (architect to the Cathedral) dealt with the architectural side of the building. At the conclusion of the tour the President, on behalf of the Convention, accorded a vote of thanks to Dr. Spence and to Mr. Waller for their services as guides.

After lunch a cricket match was played between sides representing the Gloucester Conventioneers and the United Kingdom Conventioneers.

The following was the score:—

MR. WALWIN'S ELEVEN.		MR. WELFORD'S ELEVEN.	
Mr. Clarke, c. A. H. Ward, b. Welford	1	Mr. Burton, b. Walwin	7
Mr. W. Walwin, b. Welford	2	Mr. Alf. Werner, c. Dugdale, b. Trohman	8
Mr. F. A. Trohman, b. A. H. Ward	3	Mr. Appleby, b. Walwin	2
Mr. Dugdale, junr., b. Welford	12	Mr. A. H. Ward, b. Walwin	9
Mr. E. A. Ind, c. Appleby, b. Welford	4	Mr. W. D. Welford, not out	13
Mr. Walwin, junr., b. Welford	0	Mr. H. H. Ward, c. Bedding, b. Trohman	0
Mr. H. V. Hyde, b. Welford	0	Mr. W. W. Naunton, b. Trohman	4
Mr. W. J. Crowl, not out	8	Mr. Gandy, c. & b. Walwin	1
Mr. Thos. Bedding, b. A. H. Ward	4	Mr. Wallis, c. Hyde, b. Walwin	9
Mr. R. E. Beard, c. Wallis, b. Welford	2	Mr. E. J. Humphery, b. Hyde	2
Mr. Emery, b. A. H. Ward	6	Mr. J. H. Avery, b. Walwin	3
Extras	6	Extras	6
	47		50

At the Council Meeting subsequently held Mr. Thomas Bedding, F.R.P.S., was unanimously chosen as the next President. There was a discussion on hotel arrangements, and it was decided that in future there should be no official headquarters, but that a list of hotels should be supplied, from which members were to make their own choice.

#### ANNUAL DINNER.

The Annual Dinner was held at the Bell Hotel in the evening. The President (Mr. W. Crooke) occupied the chair, and was supported at the chief table by the Mayor and Mayoress (Alderman and Mrs. Braine), the City High Sheriff (Councillor Hatton), the Town Clerk and Mrs. Blake-way, Mr. M. H. Medland (Chairman of the Local Executive Committee), Dr. Oscar W. Clark and Dr. Campbell. The company numbered about 120. The loyal toast being duly honoured.

The President proposed "Success to the Photographic Convention of the United Kingdom." The first meeting of the Convention was held at Derby in 1886, since which time it had grown, it had given pleasure and instruction, and spread interest throughout the kingdom. The members travelled nowhere but where they left their mark, or rather took it away with them; and, though their particular calling assisted them to take away a great portion of the cities they visited, the proportion was so small, and the damage done so little, that he did not think it could be



called very harmful. At one time it was considered that the Photographic Convention should be an educational organization, and many members urged the importance of having as many scientific papers as possible read. Personally, however, he did not consider that the members of the photographic profession, amateur and professional, were in a frame of mind during the Convention week to digest many scientific papers. His opinion was that they would never make the Convention anything but a gigantic picnic. They might have one or two papers during the week, but they had such a multiplicity of photographic societies throughout the country that the members must be positively gorged with photographic intelligence by the time they came to the Convention. With the toast he coupled the names of the General Hon. Secretary and Treasurer of the Convention, and the Local Secretary.

In reply, Mr. Bridge acknowledged the very great help which he had received from the members of the Local Committee, and especially alluded to the valuable assistance which Mr. Dugdale had rendered.

Mr. Dugdale said he had been only too pleased to do what he could to make the Gloucester meeting of the Convention a success. He was standing before them as the local Hon. Secretary, who, in accordance with the traditions of the Convention, would be laid out at the end of the week as an "unfixed print;" but the Gloucestershire Society numbered amongst its members three doctors, and he hoped with their assistance to be able to stand the racket of the work and be still above ground when the Convention was over. Mr. Dugdale paid a tribute to the indefatigable energies of the Local Committee, to whom great credit was due, and said they had been greatly aided in their efforts by the valuable co-operation of the Mayor, City High Sheriff, and Town Clerk.

The President announced the receipt of messages from absent friends. Mr. John Stuart, the ex-President, wired from Moffat: "An old friend of the Convention wishes you and all Conventioners a good night and many returns." Mr. A. L. Henderson wired: "I am with you in spirit and join in toast, 'Vive la Convention.'" Mr. Child Bayley, writing from his bed in Gloucester Infirmary, thanked the members for their kindly expressed sympathy with him in his accident.

Mr. Bothamley, who gave the next toast, "Prosperity to the city of Gloucester," said they had all of them, at least, they said they had attended all the meetings of the Convention except one, but he doubted whether those who could carry their minds back to the many successful meetings they had had could remember any place in which they had been more cordially received than in the ancient city of Gloucester. Members, of course, tried at times, at any rate if they had any time during the Convention, to pick up some of the characteristics of the places which they visited, and the first impression that he formed about the city of Gloucester was as to its extraordinary greediness. He had no sooner turned out on Saturday morning with a camera and the rest of it than he was stopped by a kind of brigand with a rectangular box covered with new paint and fresh varnish, and having a rectangular slit in the middle, and he was asked to give something to the waifs and strays. At the moment he was studying in vain a map of the city, and, as he did not know where he was, he explained that he was astray himself, and that he had better keep his money, which he did. But that particular greediness of Gloucester was rendered very obvious by the way in which it had managed to secure for itself a great many of the best things, and it was only mitigated by the great readiness of the Gloucester people to share all those good things with the members of the Convention. With the toast he coupled the names of the Mayor, City High Sheriff, and the Town Clerk. If he might trespass once in a way, he thought it was a particularly gratifying fact to find that all the "brain" of which they had official cognisance was divided between the people of Gloucester and the members of the Convention.

The Mayor, in his reply, said that Mr. Bothamley anticipated the desires of the good citizens of Gloucester when he wished prosperity to their fair city. On behalf of those citizens he thanked Mr. Bothamley and the members of the Convention generally for their hearty good wishes. Gloucester, as they all knew, was no mean city, and, although perhaps it was not very large, comparatively speaking, it was of considerable importance. They had heard from Mr. Bothamley that he had been much interested by all that he had seen in Gloucester, even the collection boxes which were placed under his nose upon his entering the city. He was sorry Mr. Bothamley did not subscribe his mite, because he might have been doing something to assist some of the waifs and strays in the cities to which some of the Conventioners belonged; for he could assure him that they had no waifs and strays in the prosperous city of Gloucester. He felt highly honoured that the visit of the Convention had been made during his mayoralty, and he had done all he possibly

could to accord the members a very hearty welcome. He trusted that the snap-shots and interesting visits which they had made during their stay in the city and neighbourhood would result in increased prosperity to the old city.

The Sheriff and the Town Clerk also replied.

Mr. S. B. Webber, in giving "The Photographic Press," said that one of the leading members of that body, who was no longer with them, had much to do with the institution of the Convention. With the toast were coupled the names of Mr. Thomas Bedding (editor of *THE BRITISH JOURNAL OF PHOTOGRAPHY*), Mr. E. J. Wall (editor *Photographic News*), and Mr. F. Dundas Todd (editor of the *Photo Beacon*, Chicago), each of whom responded.

The latter gentleman expressed himself as highly delighted with the civic welcome which had been accorded the Conventioners, and concluded by saying he was authorised to convey the good feeling of the National Convention of America to the National Convention in Britain.

Mr. Medland, in proposing the health of "The President of the Photographic Convention of the United Kingdom," eulogised the services which Mr. Crooke had rendered, and said the citizens of Gloucester, and particularly those belonging to the local photographic society, would always look upon that week's proceedings as one of the important events in their lives.

The President, replying to the toast, which was accorded musical honours, announced that the Newcastle meeting would be presided over by Mr. Thomas Bedding. Proceeding to speak of the high attainments which were possible in photography, Mr. Crooke said there was a multiplicity of workers in the ordinary sort of thing, and the grievance was that the public seemed to be absolutely and perfectly satisfied with the ordinary thing. In that matter education was necessary, they wanted to bring the public up to the standard of appreciating the higher forms of art and more artistic productions.

Mr. Percy Lund submitted "The Ladies, and the Convention ladies in particular," coupled with the name of Mrs. Mason, who appropriately replied.

During the evening songs were sung by Miss Hargreaves, Mr. Vivian Hyde, Mr. Bridge, Mr. Debenham, and the President, while Mr. Welford contributed a selection on the one-string fiddle. Mr. W. H. Morgan and Mr. Bridge shared the accompaniments. The proceedings terminated with the singing of "Auld Lang Syne," Mrs. Mason sustaining the solo part, and of "God Save the Queen."

The members had an enjoyable excursion on Thursday, about 130 of them visiting Chepstow, Tintern, and Symonds Yat. On Friday morning about 100 members left Westgate Bridge aboard the steamer *Avonmore*, which conveyed them to Ashleworth, Deerhurst, and Tewkesbury.

The meeting at the Guildhall on Friday evening was largely attended. The following papers were read:—

#### BINOCULAR VISION AND THE STEREOSCOPE.

WRITERS on optics frequently institute a comparison between the human eye and the photographic camera, or, strictly speaking, the photographic lens and camera, which are supposed to be alike in their capacity for forming real images of objects situated in front of them. This comparison, if briefly examined, will take us a little on the way towards realising what binocular vision is.

The manner in which a photographic lens forms an image is, of course, well known. When we photograph either a near or a distant object, there has to be a movement of the focussing screen, or, in optical language, an alteration of the conjugate foci. Let us examine in what manner the eye forms an image on its focussing screen, otherwise the retina. In so doing, we need only consider that portion of the eye which is termed the crystalline lens. This acts precisely in the same way in the formation of the retinal image as does the photographic lens in the formation of the image on the ground glass of the camera. This crystalline lens may, for our purpose, be described as a double convex lens of unequal radii of curvature. It is, in fact a crossed lens, which forms images of near and distant objects in virtue of what is termed accommodation. Accommodation consists simply of the ability of the eye to alter its radii of curvature at will. The crystalline lens is held in position between two sets of muscles called the ciliary muscles, and when the eye is directed towards some near object it becomes more convex in virtue of the property which these muscles have of compressing the lens, thus shortening its anterior radius, and, of course, increasing its degree of curvature. On the other hand, when the eye is directed towards some distant object, the curves of the crystalline lens are flattened, and their radii consequently increased.



What I have so far said may bring home to us the exact amount of resemblance there is between the eye and the photographic lens as image-forming systems. In the case of the photographic lens used for the formation of images of near or distant objects, a movement of part of the optical system is necessitated, whereas with the human eye the same end is simply fulfilled by its ability to alter its curvatures at will.

In this connexion it is, perhaps, permissible to speculate that it would be a very great advance in photographic lens construction if the optician of the future could provide us with a lens of some plastic transparent material which, by a little pressure one way or the other, would give us an instrument convertible to either a long or short-focus lens at will. Whether it is too much to expect I do not know, but in these days of advancing enlightenment scarcely any speculation as to what remains for achievement by scientific agency seems too far-reaching.

Now so far we have dealt only with monocular vision—that is, vision with the single eye. But in nature we have to deal with two eyes, and consequently we must consider in what manner those eyes, which project on a plane surface plane images of objects situated in front of them, yet enable us to realise the marvellous phenomena of distance, depth, height, and solidity—binocular vision, in short.

Lecturers and writers on the subject of stereoscopy usually tell us that we see two dissimilar views of an object or scene which the brain combines, thus giving us the effects I have just enumerated. But, if we go deeper into the theory of binocular vision, we shall see that there are revealed to us some very beautiful principles underlying the functions of the eye in the conveyance of the representation of solid objects to the brain.

Let me, therefore, briefly recount portions of the theories of several eminent men on this question of binocular vision. Helmholtz, perhaps the greatest writer we have had on this subject, points out that the eyes only see one object at a time, while Brewster, another celebrated writer on binocular vision, tells us that the eyes are always in motion, and that they realise distance, depth, and solidity by what is commonly called the greater or less convergence of the optic axes. This term is susceptible of a simple explanation. You may imagine two right lines drawn in front of the eyes, and that these lines either parallelise for distant objects or converge for near objects. The greater the convergence, the greater the amount of stereoscopic relief; the greater the parallelism, the less the relief.

Wheatstone, the inventor of the reflecting stereoscope, presents a slightly different theory. He says, in effect, that binocular vision is a psychical function—in other words, it is produced by the mental fusion of two dissimilar views.

Brücke, a German author, relies for an explanation of the theory upon the controlling action of the ciliary muscles upon the crystalline lens, to which I have already referred. Thus we obtain three distinct theories—the muscular, the mental, and the optic axes.

But the late Professor Tyndall expounded a theory which will appeal, I think, to most of us as perhaps the most easily comprehensible and rational. He asserts that, "when the optic axes are converged upon a certain point of an object, the other points produce a certain determinate effect on the retina, and are in some measure the objects of our attention. There is thus established an association between a certain convergence of the optic axes and certain incidental impressions, and this association may, I think, be so refined by habit as to enable us to infer the solidity of a body or the relative distances of objects, while the optic axes are kept immovably fixed on a single point."

In all probability the theory presenting the greatest subtlety and difficulty of acceptance is that advanced by an American writer—Dr. Le Conte. He says that "the retinal image impresses the retina in a different way; this impression is then conveyed by the optic nerve to the brain and determines changes there, definite in proportion to the distinctness of the retinal image, and then the brain or the mind refers or projects this impression outward into space as an external image, the sign and facsimile of an image which produces it."

Having briefly endeavoured to place before you some of the various known theories of binocular vision, I will digress from the main subject, and point out the importance of the theory of binocular vision in relation to what we call pictorial photography, a relation which is not widely suspected, and may strike many with surprise.

About ten years ago a notable book was produced under the title of "Naturalistic Photography." Like other notable books it excited much comment and opposition, and, above all, was grossly misunderstood. Most people, however, are probably unaware that the whole theory of naturalistic photography which the author, Dr. Emerson, worked out, relies entirely upon an intimate study of the phenomena of binocular

vision. In the third chapter of this work, mostly overlooked by its reviewers, the author goes very fully and exhaustively into the principles of binocular vision—what the eye sees, and how it sees it, and, reasoning out the application of those principles to photography, comes to the conclusion that we should go to nature for our photographs and photograph nature as the eye sees it, that is, in accordance with the laws of binocular vision.

You will recollect that Helmholtz told us that we only see one object sharply or distinctly at a time, and that we are only conscious of the other and surrounding objects. This proposition, I take it, no photographer who uses his eyes will controvert, and thus it will be perceived that naturalistic photography, as reasoned out by Dr. Emerson, relies entirely on a scientifically established basis.

This association of science with art may, perhaps, have the effect on many that the red rag is popularly supposed to have on the bull. No one likes less to hear of the intimate relations of science with art than the "photo-faker" or "photo-dodger." Still the fact remains that, in making pictorial photographs, you have here a little bit of sound scientific reasoning which places you secure in the knowledge that, if you take your photographs according to these rules, you are producing them just as the eye sees nature, which seems to be only a common-sense way of doing things.

Passing now from this branch of our subject, we come to the stereoscope itself, of which a body of photographers like that which I am addressing needs no description. Among the general public, however, the functions of the refracting stereoscope, dismissing from our minds the form which depends upon reflection, are woefully misunderstood. It does not possess any wonderful occult property, nor is it a magic construction that produces effects difficult of explanation. The functions of the stereoscope may be summed up in the remark that it resembles a pair of spectacles in so far as it assists or corrects the human vision in the examination of binocular photographs. It has often occurred to me that the stereoscope as an optical instrument receives but scant justice at the hands of modern opticians. I feel that, when one wishes to view photographs by the stereoscope, he should have his eyes tested as carefully as he should for a pair of spectacles, as it is obvious that defective vision enters as much into the one case as the other. Were this systematically carried out by competent persons, it might be possible to put the lenticular stereoscope on a footing from which it would not easily be disturbed. Each instrument would be fitted for the special optical requirements of the individual, inequality of foci, distance of eye separation, and the aberrations being provided for. The fact that this is not done is probably the cause of so many of the complaints that we hear from people who do not understand what stereoscopic photographs are, or how they are viewed, and for whose defects of vision, where they exist, no provision is made. Thus a beautiful branch of photography is very often misunderstood and condemned.

But my main purpose now is to speak, not about the improvement of the stereoscope as an optical instrument, but to endeavour to throw out a few suggestions for means whereby you can dispense altogether with the stereoscope in the examination of binocular photographs.

In times gone by, several methods have been published, designed to enable persons of normal vision—and it is of normal vision only to which I refer throughout—to see stereoscopic pictures stereoscopically without a stereoscope. It is one of the easiest things in the world to acquire, and, when acquired, it is a faculty from which you can extract a world of enjoyment.

Going back to Brücke's theory, by which the ciliary muscles of the eye are supposed to play the most important part in binocular vision, there is a simple system, devised some thirty years ago or more, which, if practised for a little while, will give the eyes the necessary command over axial parallelism, divergence or convergence, so as to enable them at the focus of normal vision to see stereoscopic photographs in relief.

Here it is. Two sheets of white paper are required. Upon one, near its upper margin, make two circular marks in ink an inch apart; upon the other one, also a circular ink mark or dot. Hold the latter paper about 20 inches from the eyes; interpose the former about midway between the eyes and the paper with the one dot, so that the three dots appear in a line. Now look intently at the farther dot; the mind will shortly see three dots on the first paper. When this effect has been obtained, substitute for the paper with the two dots another sheet having dots  $1\frac{1}{2}$  inches apart, and, when with these the effect above described has been obtained, the distance of separation may be yet further increased, and the muscular control thus obtained will enable a binocular photograph to be substituted for the sheet of paper with the two ink dots. The centres of the photographs should be not more than  $1\frac{1}{2}$  inches apart, and these may be





MEMBERS OF THE FOURTEENTH ANNUAL PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM

Negative by A. H. Pitcher, Photographer, Gloucester.







gradually increased. Let these two photographs and the dot be looked at as were the three dots. Three photographs in a row will shortly be seen, and then the beautiful effect of a single photograph in relief will present itself. In all my experience of photography, nothing has given me so much fascination as the moment when, having practised the little experiment above described, I first acquired this valuable facility of dispensing with the use of a stereoscope. It is one of the greatest pleasures I enjoy that I am always able to take up a slide or transparency and instantly and perfectly perceive it in its stereoscopic form.

So far I have explained how this little feat, which is wrongly supposed to be difficult of acquisition, but is not, may be acquired; but I would now wish to draw your attention to the fact of the human eyes being, after all, probably the best stereoscopes to employ, having been recognised by Elliott, the Edinburgh optician, over sixty years ago, before the invention of the stereoscope itself, either as a reflecting or refracting instrument.

The first stereoscope (Elliott's) contained no lenses or prisms at all. It consisted simply of a plain apparatus for enabling you to see stereoscopically dissimilar drawings, which, of course, long preceded the advent of stereoscopic photographs.

Imagine, then, a rectangular box, about eight inches long, with a division running down its centre, and two holes where the latter-day lenses are fixed, and a groove at the further end wherein you drop your specially prepared drawing or stereoscopic photograph. These holes themselves may be supposed to perform the function of the stereoscope in parallelising the optic axes. They enable the left eye to see the left picture and the right eye to see the right picture only, and this is practically all that is required in the examination of binocular photographs.

Ordinarily we converge the optic axes, but what we have to do in stereoscopic photography is by muscular effort either to parallelise or diverge them, and so present one picture to the left eye and another to the right eye.

I hope it will not be imagined that the suggestion I am about to make is too chimerical, but it occurred to me recently, noticing that books are being illustrated by means of stereoscopic pictures, that children—in whom one might imagine the muscles of the eye to be in a supple state—might be easily taught, without inconvenience, to use their eyes as a stereoscope in the manner I have above already described.

I have recently tried the experiment, with every success, upon two of my own children, who are in the habit of looking at stereoscopic photographs in a stereoscope. I constructed a box similar to the one described by Elliott, put prints in, and told them what to look for and how to look for it, and after a while they could see binocular photographs quite stereoscopically without the use of lenses. I then took a Holmes-pattern stereoscope and removed the prisms, and still the children were able to obtain the stereoscopic effect. Hence it will be seen we here go to the first principles of Elliott. It seems to me that, in this age of physical and muscular education, which is largely taking the place of mental culture, somebody might take up this point of the education of the eye for stereoscopic purposes. By so doing it is not difficult to foresee the time when the majority of our books would be illustrated by stereoscopic photographs, and we should all be able without effort to see reproductions of art and nature in the relief, depth, and solidity with which the eye sees creation itself.

I hope to refer to this subject on future occasions.

THOMAS BEDDING.

#### "WORDSWORTH'S COUNTRY—ILLUSTRATED BY THE PHOTOGRAPHER."

In the north-west of England lies a tract of rugged hilly country, measuring some thirty miles from north to south, and about twenty from east to west. Among these northern hills, some of which rise sufficiently high to be justifiably called mountains, lie some of the most beautiful vales in our island, and in many of these valleys delightful lakes are imprisoned. There is probably no other tract of country in Europe where, within a comparatively small area, one may find so many types of scenery or enjoy such varied atmospheric effects.

Although most of the principal valleys converge towards the highest group of mountains, from whence the observer can see them stretched out, map-like below him, radiating outward like the spokes of a wheel, yet each of these valleys has a character of its own, "in some instances," says a well-known writer, "as if they had been formed in studied contrast to each other, and in others with the united pleasing differences and resemblances of a sisterly rivalry."

The forms of the mountains also are endlessly diversified, and their slopes change in condition, as the altitude becomes greater, from meadows of great fertility to wooded steepes, and then to rocky ridges, precipices, and screes, with summits often made up of huge blocks of stone scattered in the utmost confusion. Streams and cataracts fall down their sides, which often, after heavy rain, increase in number and volume, and fill the air with a strange roaring sound.

In winter the hill tops carry a snow cap for several months; in summer their sides become green with bracken, and all kinds of ferns and mosses flourish in the rock crevices with the greatest profusion.

I have said that the valleys show great diversity of appearance. Some of them are well under cultivation, others remain stony and wild, serving only to provide pasturage for the flocks of mountain sheep. Woods abound in places, oaks, beeches, birches, and the mountain-ash flourishing to the greatest extent. As to the lakes themselves, they differ very materially one from another, some being broad and having irregular shores, others narrow and resembling a wide, winding river, some covering an area of many square miles, while a more numerous class are but a few acres in extent.

Such, then, is a very bald and inadequate description of the main features of our English Lake District. One need hardly add that for the sun-artist in particular, also for any who occupy themselves with the study of nature in its varied phases, the Lake Country possesses the most alluring fascinations and the most advantageous opportunities.

But it enjoys also, in addition to natural charms, the interest of association with many writers and poets, who have lived or sojourned among its hills, and left in prose or verse lasting records of the impressions they experienced under the influence of external nature—impressions of storms and sunrises, of mysteries of light and atmosphere, of the songs of birds and the plashing of streams.

Southey, Coleridge, De Quincey, and, last but not least, Wordsworth, are a few of the names indissolubly connected with the Lake District.

William Wordsworth interpreted nature as no poet had done before his time, and, as he lived almost the whole of his life in the Lake Country, there is hardly a feature which he has not in some way touched upon, hardly a beautiful scene which has not received at his pen

"The gleam,  
The light that never was on sea or land,  
The consecration and the poet's dream."

His poetry is the poetry of common things, of human experience connected with nature's works, of nature as the connecting link between the human and the Divine.

Believing that to study the poems of Wordsworth in the midst of those rare natural surroundings which inspired them would be at once the best way of finding the truths they hold, and arriving at a full appreciation of the country we call Wordsworth's, I began not long ago, at those times which I could spare from a busy life, such a course of work. Visiting first one valley and then another, I followed the footsteps of the poet from his school days at Hawkshead to the home of his old age at Rydal, seeking, under the guidance of his verses,

"To look upon the hills with tenderness  
And make dear friendships with the streams and groves."

But that was not the whole of my scheme. Mental impressions were to be aided with pictures. With my camera I proposed to make records of Wordsworth's favourite haunts—his homes, and hoped even to represent pictorially some of the finer descriptive passages that lent themselves best to such treatment.

The scheme was ambitious—an attempt to grasp the connexion between nature, art, and poetry, and so far but a small measure of progress has been achieved.

To be quite candid, the pupil was far from apt; getting and spending had put him out of tune with the subtler side of nature. Like a child plunged suddenly amid unfamiliar wonders, he was distracted by the sensuous beauty of the scenery, the joy of basking in glorious sunshine, the delights of climbing lofty crags, or of contemplating the wreathing mists as they unfolded the hills. All these things induced a condition of subjectively, rather than objectively, making personal action not unlike the paralysed moments of a dream.

Let me take you in imagination to the vales and mountains of Westmoreland and Cumberland, and, as we see the views upon the screen, I will venture to give a very brief epitome of Wordsworth's life, and adorn my tale with a few quotations from his poems.

PERCY LUND.



## TALES OF A WAYSIDE INN.

"Ticket for Gloucester, sir?" said the booking clerk at Paddington as he espied me through his little pigeon-hole window with my patent-rising, back-sliding, take-'em-any-how, brand new camera, with aluminium bayonet tripod.

The surprise on the man's face gave way to a grin and a wink as I corrected him and said, "Tourist for Cheltenham *via* Gloucester, please, where I may perhaps break my journey." As the change was handed to me I felt a calm satisfaction not so much at the fact that I had saved a few shakels of silver, but at the thought that I was stealing a slight march on the astute Conventioners by getting an extra half-day at Cheltenham and Oxford on my return if I wished to do so, a tip that future Conventionists to the Cider City and neighbourhood would do well to bear in mind.

It was close on seven in the evening of the Convention Dinner when the New Inn was reached; and I only got a hurried glance at the surroundings before dressing for the forthcoming gastronomic function about to be perpetrated at the Bell, which was the headquarters of the Convention, so that the description of the more ancient Hostel will have to wait until the "aching void" within is filled.

Being a stranger the forethought of kind friends provided me with a seat near the Beddington corner of the table (I dare say you know that corner, sir?) and after a cordial handshake with the future President I glanced around at the hundred odd guests there assembled, and requested my right-hand neighbour to inform me who were the principal persons present. He said he did not know them all, but gave me a few of the names hereinafter mentioned.

These names included two gentlemen in glittering armour—beg pardon—chains, whom I believe to be the City Lord High Executioner, commonly called the City High Sheriff, and the Lord High City Mayor (is that the correct title, sir?). Between these two were seated the Shepherd (President) of the Flock, a man without a crook; close by him sat the City's High Town Clerk and his partner, and the Society's high-minded local Secretary, next again was the Treasurer and Secretary of the P.C.U.K., Goodman Old Bridge, Esq. Other notabilities were Bishop (of London) and Lady Singwell, the G.O.M. and his son Ralph Redwill, Alphabet Leighotham, Esq., F.I.C., F.C.S., &c., Professor Murus (the sage of Cecil Court and patenter of "Anti-squint"), Percy Wordsworth, Esq. (*et ux.*), T. P. Shutter, Esq. (specially released for the occasion by Father Time), Keadck Dot of New York, U.S.A., Vyvison Jekyll, Esq., Philmand Plato (of Warwick), Herr Secco (of Berlin), Coalblack Fryers, Esq. (no relation to "Checky" of that ilk), Avery Carmel, Esq., Sandy Henderson, Esq., Harold Handsome, Esq. (of Brum), Albert Moredon, Tut Tut, Esq. (of Shaftesbury Avenue) the newly appointed Honorary Carpenter and Handy Job-master to the Convention, Harri Corniescen, Esq. (of Falmouth), Wantmore Paxcard, Esq. (of Chester), Walter Singlestrung Welldone, Esq. (of Chancery-lane or thereabouts), A. Fatman, Esq., Mrs. Fatman and the little Fatmen (accompanied by the Cathedral Belles), Snowdon Fairface, Esq. and Mrs. Fairface, Genial Alfred of Steepletown (*et ux.*). The Attorney General of St. Martin-in-the-Fields, and many others, including Lord Knowswho.

There was, however, one great link missing in the chain of illustrious names above mentioned; it was, alas! that of the Child of Photography, whose misfortune and sufferings were the subject of sympathetic comment throughout the evening.

The dinner, *per se*, was not an unqualified success. The cooking was good, but the difficulty we experienced at our table was to get served with anything.

By the way, I wonder how the word "waiter" became applied to the modern "*garçon*." I must look that up. If a "waiter" is a person who "waits," it is certain that at our table he "waited." We did not object to his waiting; it was the time he waited. He waited too long, and so did we; in fact, we are, I believe, still waiting for those absent courses. If one asked for calves' head, should he be given gooseberry tart?

One old waiting-man—we nicknamed him "Methuselah"—I at first mistook for the late Duke of Wellington. He was rushing about with a single plate in his hand, offering it to everybody in a most bewildering manner for about five minutes by the local "Waterbury." I thought the poor old chap had gone mad, and was about to ask his way to the local lunatic asylum, and end his days where the rattle of plates and dishes and the popping of corks would have to be carefully concealed from him for fear of exciting the suicidal mania that appeared to lurk in the corner of his feverish eyes.

The golden ambrosial fluid of France (uniced) was running like water, eyes were beginning to brighten, tongues to wag, or, as the editorial

loquacitor (good word that, sir) would have remarked, "The leashes of free speech are let loose upon us—let it be done." And it was done.

The Presidential Crooke rapped upon the table, and the bleating of his flock became silent even to the hush of expectancy. The speeches began. As the great pendulum of the Photographic Press will, doubtless, swing to and fro, marking with each beat the more minute details of these speeches on the page of time, it behoves me not, as a looker-on, to make many notes thereon. But what did strike me was the cordial harmony of the meeting. It was what one might term a Mutual Admiration Society.

The cordiality of the speeches of the civic and municipal representatives of Single and Double Gloucester, and the return of the courtesy by the President of the Convention was very marked. Then there were delicate compliments to the Press, coupled, Mr. Editor, with the name of the President-Elect, and the *apropos*-ness of his reply, seizing as he did in a masterly manner the points made by the President, and neatly turning them into humorosities of the first water, inspired perhaps in a slight degree by second and tertiary applications of the sparkling fermentations from France. Well-punctuated and mellifluous periods of peroration fell, sir, as they properly should do from the lips of the representatives of the Press. Some one again said, "Let it be done well" (with the accent on the "well"), and it was done, and done well, and had it been Donemore it might have been too dry. Speeches, toasts, and songs went hand in hand, and when at length the meeting broke up everybody was happy, a few hungry, and the majority—thirsty.

This meeting was but the precursor of another and less formal, though not less merry, one, for the majority of us adjourned to that ancient and delightful hostel yept the New Inn.

For those of your "perusers," Mr. Editor, who have not visited this Convention a little description of the *locus in quo* would not perhaps be considered out of place here.

The exact date of the erection of the New Inn is not recorded in local history, but it was rebuilt after a fire in the year 1457. Its architectural characteristics have been brought to light and enhanced considerably by its present owner and our host, Mr. Berry, of whom I shall have to say a word or two anon. This galleried inn with its trailing creepers and quaintly carved oak, so picturesque in the twilight, became at night a modern "All of 'Armony." It seems to me almost a sacrilege to say so. The courtyard was pleasant and cool after the heated dining-hall of the Bell, and tables and chairs were brought out, big and little groups formed, and conversation, song, story, and gaiety reigned supreme.

As I sat in a quiet corner I pictured the more stirring days seen in this quaint old country courtyard. What tales could not those black old beams unfold had they but the power of speech? and what a contrast there was between the scenes here in the days of old and the modern *café chantant* show before me. The booted and spurred gallant had given place to—the camera man. Such is the progress of civilisation!

The contrast was deepened at that moment by the clamour of the Cathedral chimes,

"Whose slow and stately changes,  
Speaking of bygone ages,"

made the chords of the piano sound like a jangle of profanity.

Generation after generation passes away, but those sonorous bells ring on and on, heedless of the flight of time—'twas a strange thought to think to the clinking of glasses.

Speeches were made, healths drunk, and the songs and music were alternated with clever card tricks by Mr. Wantmore Paxcard, and many stories told—all fit for publication, Mr. Editor—at least, until the ladies left at midnight, after which time it is not distinctly remembered who made the last speech or told the last story. All I know, sir, is that your very good health, with musical honours, ended a very enjoyable evening (and morning).

We retired to bed (after having partaken of light supper) to sleep "and perchance to dream."

I had a short dream; it caused me a little uneasiness, but it was only momentary.

I dreamt that the duck I had partaken of at dinner had gobbled up all the peas, and was floating on a pond, the confines whereof were bounded on one side by my diaphragm.

Mr. Editor, this and another story I may tell you some day—with your kind permission—is copyright, and if Professor Murus sneaks them for the next Convention there will be a vacancy on the staff of the paper he so ably conducts, and I shall have great pleasure in contributing to the



funeral expenses in the interest of humanity, even if I have to do a tight-rope performance afterwards.

On the next day (Thursday) a vast array of photographic apparatus was lugged and tugged and hugged by a perspiring multitude of enthusiastic ladies and gentlemen in variegated costumes to the railway station *en route* for the Chepstow and Tintern excursion.

At Chepstow they photographed the castle, the door of the courtyard, the keep, and, when they had nothing else to take, they took each other, and one gentleman, I am sure, was taking more than was good for him (his name is Nemesis). The best view I got was at the Beaufort at Tintern. It was a grand view, everything composed beautifully. Many others appreciated this particular view very highly, and it did not belie our first impression, for we all enjoyed it. I refer, sir, to the view of the luncheon tables.

Have you ever pulled from Tintern to Chepstow in a boat, sir? I have reason to believe, "from information received," that you have, and that your adventures were worth recording. I did hear that Professor Murus pulled stroke, and with lightning rapidity saved the ship, and that, in the language of binocular vision, your party not only saw "rocks" in the photographic sense, but felt the solid image thereof, and nearly landed, as Mr. Meter would have said, "in the middle of next week." This, in consequence of the Aethmatical Foghorn who steered you through the rapids slipping his rudder-string at the critical moment. I congratulate you all, sir, on your escape, and the Professor on the promptness with which he handled his oar. Truly, as the poet forgot to sing,

"In the hands of men entirely great  
The oar is mightier than the pen."

That night was a night of rejoicing, but all retired early in view of the morrow's excursion by boat through "Churchland," *via* Ashleworth and Deerhurst, to Tewkesbury. Stereoscopic Alfred, of Steepleton, photographed us on the boat just before starting, and forty or fifty other people wasted good material in a similar manner; but, I suppose, the one is for business and the other for the sake of reminiscence. I took—"Bass."

The river journey was pleasant, but business was brisk. The unconventional uncommercial travellers unbosomed the virtues of their wares indiscriminately; there was no escape for the victim except by drowning. I drowned my sorrow in another Bass, whilst some idiot drowned me with the contents of a ginger-beer bottle, the cork of which took a heavenly direction before its time. I would have burnt that cork slowly and surely with agonising torture had there been a fire, but as there wasn't I could not drown it, the only other means of death on board, and who ever heard of drowning a cork?

*En route*, every architectural subject was subjected to the searching glare of the lens.

As I don't, as a rule, care for churches (Sundays, of course, excepted), I took a stroll *solus*, alone, by myself, everybody else going to church—it is the proper thing, you know, sir—and I took a snap with a camera, specially filled for me by the amiable Moredun Allet (Sh! spell 'em backwards), at a bent old man with a sickle, standing on a rustic bridge near an old cottage, cutting nettles. There was a tall tree close by, and in the distance the church spire peeping through the tall elms, and some palings in the foreground; but, of course, I apologise to the Convention for thinking of taking such a rustic subject when there was a church in the vicinity. At Deerhurst, Harri Cornisson and I drove some sheep down a lane, and we never got near the church, and have no regrets. Some people do prefer lamb and mutton to bricks and mortar; it is human nature, except perhaps for a lanternist.

Here the passengers were cinematographed, and, had I not been at lunch at the time, I should have quarrelled with the boatman on the plank and disappeared into the waters beneath for the sake of a little variety for the cinematographist.

Tewkesbury is too well known to need comment, and the side alleys were particularly worthy of photographic effort. Life in the country slums contrasts very favourably with that of the greater cities.

This night is indelibly printed on the tablets of my memory. First, sir, your lecture, and Professor Murus's remarks on the question of the stereo squint, combined with another gentleman's views into futurity can never be forgotten, and the comical question put to you, sir, by the Chairman, when he asked you how it was he could sometimes see two images with his eyes when, in reality, there was only one? This reminded me of the story of two celebrated statesmen entering the House of Commons after dinner. One said to the other, "I say, Pitt, I can't see th' Speaker!" Pitt replied, "That's funny; I can see two!"

Not that I would insinuate for a moment that your Chairman was suffering from too much clearing solution, of which soda forms an integral part.

But the greatest fun of the night was meeting the commercial stranger from Scotland in the landlord's sanctum at the New Inn.

Sitting quietly in a corner, his bright eyes ever and anon twinkling with amusement at the witticisms of the President and others, his bulky form at length arose, and he held forth in a strain that you, sir, as well as those present, will never forget. His description of the photographer was quaint. He said, in his own inimitable Scotch way, that he "had often seen gentlemen—good-looking young gentlemen like the one opposite" (pointing to the Lord High Carpenter, whose waxed moustache had caught his lynx eye), "nicely dressed young gentlemen, some with knickerbockers on, and some with a round piece of glass stuck in one of their eyes—carrying what he thought was a small box." He had often wondered, he said, what these small boxes were; he didn't know what they called them, nor what they were for, but, as the fellows always carried a funny kind of three-legged pole with them, he presumed they were gentlemen bird-catchers in a good way of business.

Print fails to convey the humorous way this was spoken, but it went home to the flock amid shrieks of laughter. Being invited to attend the next Convention, he said he would be delighted to do so, did business permit; and there was one thing he would propose if he became one of the Society. He would suggest that the qualification of membership should be a double one, and that no member be allowed to attend Convention without a lady. If, he said, it needed two of those little boxes, why, let there be two, and one little three-legged pole, if they were expensive, as some one suggested, why, the same could be used by both.

As you, sir, very properly asked, Was blood relationship to guide the qualification of the lady members? The gentleman's reply was as emphatic to the contrary as the laughter was loud.

As the light was good, I took a snap-shot before retiring to rest. Good morning, sir.

Before closing, I cannot refrain from paying a high tribute to the kindness and attention we all received at the hands of the landlord and his amiable spouse, to say nothing of the pleasure we felt in having the company of his charming little daughter and baby. The President, as is well known, took a very fatherly interest in the latter. We were more than comfortable, and the staff ably assisted the landlord's efforts. The New Inn is the best hostel I have had the pleasure of visiting.

A GLOUCESTER PILGRIM.

## A STRANGER AT THE CONVENTION.

BY A SCOTSMAN.

It is said that opium exerts a powerful influence on the imbibers of the fumes of that said article, and, once indulged, the victim is practically powerless to escape from its snares; the same fascination—but, let us hope, in a beneficial instead of a hurtful capacity—obtains fast hold on the photographer who has once indulged in the delights of the Convention. He or she, or rather, to give that preference to the ladies which we learned as boys, especially when a flogging or some nauseous medical prescription was in question—she, or he, is with difficulty prevented attending, every effort is made to secure attendance at the annual pow-wow, or, more properly, photographer's picnic, and, when personal attendance is denied, the unfortunate Conventioneer is present in the spirit.

Your readers may pardon a few notes from one who was at Gloucester—a stranger in a strange land—who, from his very ignorance, may perchance write something that if not edifying may be at least amusing to those who know better; they may even have that opportunity, dearly beloved by all, of laughing at, if not with, the writer.

Many things attracted the notice of a visitor from "ayont the Tweed" that even a lengthy railway journey and some exhausting waits at weird, gloomy, half-lit railway stations were not sufficient to efface. Perhaps first might be mentioned the striking difference between Scottish and English scenery. The majority of the hills seen were grass-clad to their summits instead of the heathery slopes of "Caledonia stern and wild," the fields were divided by hedges—rustic in their unprimed simplicity—or dykes sufficiently "ragged to be artistic; these were pleasing to a photographer's vision when compared with the stiff, utilitarian wire fences on the other side of the Border. The landscape was almost invariably diversified by trees which grew here, there, and everywhere in beautiful profusion, not the stiff, business-like warriors of a northern clime, but "with verdure clad" to their very roots. Well may the Sassenach make pleasing tree studies, he has every inducement. The trees situated in the centre of fields form many pleasing backgrounds for cattle studies, and the pigs feeding in the orchards formed a scene at once quaint and unusual to northern eyes. In a word, English scenery may be described as "pretty," while the proper word for Scottish



scenery would be "grand." In both cases, of course, I speak in general terms.

The wealth and beauty of colour and arrangement in these rare old typical "half-timber" houses, of which we saw so many in the excursions last week, can perhaps best be appreciated by those who view them as novelties, while the magnificence and grandeur of the glorious ecclesiastical buildings that we were privileged to view will be for long a treasured memory. Time was all too short to allow even to be partially satisfied; the desire was ever present to "live" amongst them, at least for a long time.

It is, perhaps, too late in the day to write of the invariable kindness of Conventioners to strangers. The masters of our art were always willing and anxious to give to novices the benefit of their knowledge, and here a humble scribe would tender to many—the list of creditors is too long to individualise—his humble and heartfelt thanks.

The energy displayed by some—and perhaps in this respect some of the ladies showed a greater vitality and ability for work than the men folk—and the caution by others, were noticeable, and at times amusing. For instance, when an energetic one found a coveted view in the possession of a cautious one, the evident impatience displayed by Energy was in striking contrast to the nonchalance of Caution.

In connexion with the ancient domestic architecture, I had almost omitted mention of a feature that struck me, namely, the old builders, whether with an eye to effect or not, I am unable to say—placed the chimneys "all over the shop;" the present utilitarian age invariably, unless where they copy from the architecture of the past, always places them on top of the gable, and therefore loses a valuable means of giving variety and beauty to their work.

The field labourer is different, too, from his Scottish brother; he seems to take matters more leisurely. A Scotsman goes to work in the field coatless; the Englishmen, while he, like his Northern brother, does not wear his coat, carries it with him, probably as a precaution against any rainfall, or, perhaps, to show that he possesses such an article of attire; the latter, involving a certain degree of pride, may be the proper reason, as on one of the excursions I noticed a railway porter prominently flourishing a gold—no, I won't say it was brass—ring.

Speaking of porters draws attention to the politeness displayed by the railway companies in their announcements. They say, "You are requested to cross the rails by the bridge only." In Scotland the, railway autocrats announce, "Passengers must cross the rails by the bridge only." No request there, a peremptory demand to their humble servants, the travelling public.

Then, again, it seemed strange to see a railway station called "street," such as Oakle street; probably this may be a survival of the famous Roman Watling-street.

I have not yet tried the President-elect's three- (spot) card trick, but, even at the extent of risking the symmetry of my eyes, I intend doing so at an early opportunity. I was glad to hear Mr. Lund's lecture and see his slides, as it directed attention to a branch of photographic work that I had the honour to direct attention to two or three years ago, although in a much more humble direction. The work suggested gives great scope to the worker, and still further endears him to the favourite author whose wanderings he follows and whose life and work he attempts, however feebly, to illustrate.

The increased pleasure of a trip by boat, contrasted with the dirt, hurry, and noise of a trip by rail, renders it imperative that the Council, in arranging its trips in future years, should always include at least one trip by water.

In conclusion, let me express the thorough enjoyment the Convention was, and express the hope that I may meet the "camera-men" and ladies frequently in years to come.

### THE MEASUREMENT OF SHUTTER SPEED.

LIEUTENANT R. R. RAYMOND, of Boston, Mass., contributes the following paper on this subject to the *Scientific American* :—

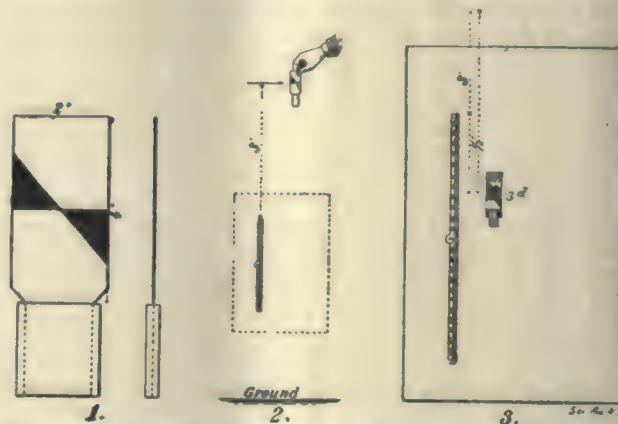
There are to-day published a number of tables giving the proper time of exposure for different subjects in different classes of light, at all hours of daylight, and all seasons of the year. These tables are a valuable guide to photographers; but, in order to use them intelligently, it is necessary to know the speed of one's shutter. The figures found on the indicator dials of most shutters are far from accurate, but are generally accepted as correct because at first sight the measurement of a shutter's speed, when set for instantaneous work, appears too difficult to be attempted. It may, however, be accomplished quite accurately in the following simple manner: Take a piece of white cardboard shaped as shown in fig. 1, and draw upon it the figure shown, being careful that the upper edge of the lower black triangle is in prolongation of the lower edge of the upper triangle. Now insert the narrow part of the card in a piece of lead pipe about two inches long and one inch in diameter, and then flatten the pipe so as to fasten it securely to the card. With the addition of an ordinary two-foot rule, this is all the apparatus needed.

Select a brightly lighted wall, and mark a point about six feet above the floor or ground. Then fasten the rule vertically against the wall with its upper end exactly three feet below the mark. Set up the camera

squarely in front of the rule and at such a distance as will give the largest possible image of the entire length of the rule. Focus sharply and use a small stop.

The card should now be held so that its centre mark is just beside the six-foot mark on the wall. Fig. 2 shows all in readiness for the drop, the dotted rectangle representing the field of view of the camera.

Now release the weighted card so that it will fall close beside the rule,



and expose the plate while the card is passing the rule. This will require care, and it would be well to practise it several times without withdrawing the plate-holder slide.

The plate must now be developed, and will show a picture like fig. 3, in which the centre mark of the card is blurred by its motion. This motion must be measured by the scale shown in the photograph of the rule (never with the rule itself), and must be expressed in feet. Call this distance  $d$ .

Let  $t$  be the time in seconds that the shutter was open. Then  $\frac{d}{t} = v$ , the velocity of the card in feet per second at the time of exposure. Observe the distance that the centre of the blurred mark has fallen below the upper end of the rule. Add three feet, and the sum is the sum total distance that the card has fallen. Call this  $h$ .

Neglecting air resistance, we have from the law of falling bodies  $v = \sqrt{2gh}$ . Equating the two values of  $v$ , we have  $\frac{d}{t} = \sqrt{2gh}$ . Solving for

$t$ , we find  $t = \frac{d}{\sqrt{2gh}}$ , in the second member of which all the quantities are known.

Example.— $d = 3'' = 0.25'$ ;  $h = 4'$ ;  $g$  may be assumed as 32.2. Then

$$t = \frac{d}{\sqrt{2gh}} = \frac{0.25}{\sqrt{257.6}} = 0.0156 \text{ second, approximately.}$$

The card may be dropped from a greater height than three feet above the rule, and the greater the fall of the card the greater will be the accuracy of the result; but the greater will be the difficulty of getting the picture of the card at the proper place.

The following table gives shutter speeds from  $\frac{1}{100}$  second to about  $\frac{1}{1000}$  second with sufficient accuracy for ordinary purposes. By placing the camera at a greater distance from the wall and using a longer drop of the card, the table may be extended as desired.

Total fall in Inches	Fall of Card During Exposure, in Inches.											
	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
36	0.003	0.006	0.009	0.012	0.015	0.018	0.021	0.024	0.027	0.030	0.033	0.036
42	0.003	0.006	0.008	0.011	0.014	0.017	0.020	0.022	0.025	0.028	0.031	0.034
48	0.003	0.005	0.007	0.010	0.013	0.016	0.018	0.021	0.023	0.026	0.028	0.031
54	0.003	0.005	0.007	0.010	0.013	0.015	0.018	0.020	0.022	0.025	0.027	0.030
60	0.002	0.004	0.007	0.009	0.012	0.014	0.017	0.019	0.021	0.023	0.026	0.028

### DETERMINATION OF SOLUBILITY.

For a correct determination of solubility, it is important, points out our contemporary, *The Pharmaceutical Journal*, in the first place, that the substance to be dissolved and the solvent should both be quite pure. The solubility of nearly, though not quite, all substances varies according to the temperature, and this must accordingly be maintained constant and be accurately noted. For this end, the vessel containing the substances under experiment is immersed in a bath of water or other liquid, which



is kept at a steady temperature; if this temperature is above that of the surrounding air, an automatic regulation of the heat supply is best; such an arrangement is called a thermostat. Several kinds of thermostat are in use; they are obtainable from makers of scientific apparatus, and need not be described in detail here; the principle on which the heat is regulated is the same in all of them. The gas supplied to the burner by which heating is effected has to pass through a tube which is in connexion with a reservoir containing some very expansible substance, immersed in the bath itself. The connexions are so arranged that expansion of the substance in this reservoir partly closes the tube through which the gas is passing, and so diminishes the supply, while contraction again increases it.

The substance whose solubility is to be found is reduced to powder and added to the solvent until a good deal remains undissolved; the mixture is now put into the constant temperature bath and kept in a state of continuous or intermittent agitation for a long time. When no more appears to be dissolved, the excess of the solid is allowed to subside, or, if necessary, it is removed by filtration. A portion of the solution is then removed, weighed, and carefully evaporated to dryness, and the residue again weighed; in this way the exact strength of the solution is found. To check this result, the remainder of the solution and the excess of the solid are again agitated together for some time at the same temperature as before, and the strength of the solution again found, as before. Or the temperature may be raised and solution effected at the higher temperature, and then the whole allowed to gradually cool down to the required temperature and kept at this for some time, the strength being then found as previously. The results found in these ways ought to agree very closely.

#### KODAK VERSUS GAMAGE: MR. JUSTICE STIRLING'S JUDGMENT.

MESSES. KODAK, LIMITED, send us the following notes on this case, which were unavoidably held over from our last issue:—

The decision in this motion is very important to manufacturers and dealers as clearly showing the legal relation of the manufacturer and the retailer in respect of retail prices. It is evident from the judgment that every manufacturer can legally protect himself from his fixed retail prices being cut by one dealer, who seeks thereby to get an unfair advantage over other dealers. The discounts given by manufacturers are intended to give a fair and living profit to the dealer, and to him alone. If the discounts be greater than are needed for a living profit, then the assumption is that they ought to be reduced. If under-selling sets in, there is no end to the competition, and the result is that the businesses of the smaller men get extinguished. There is no question of monopoly or boycott. The dealer gets a liberal discount for himself on condition of selling at certain prices fixed for all alike, and it is a breach of faith if he departs from these conditions. He is then in the undignified and dishonest position of having to conspire with pseudo-dealers and other intermediaries to get the goods by back-stair methods, giving discounts away in order to keep up a reputation with the public of selling well-known articles at a lower price than other dealers. The great stores have given up this position in regard to photographic manufactures, and it is very unlikely that any one dealer will be able to sustain such an attitude for any length of time.

It ought to be generally known by all manufacturers and dealers that a form of invoice, with restrictions, or referring to restrictions, on a discount sheet, makes an effective contract.

Mr. Justice Stirling, in the course of his judgment, after saying that the duty lies with the vendor to take care that his stipulations are brought home in a clear way to the purchaser, observed as follows: "It appears to be the fact that circulars were published by the plaintiff Company from time to time, and all that would be necessary would be to put in the invoice of the goods a reference to the circular for the time being in force."

#### THE ROYAL INSTITUTION.

At a general monthly meeting of the members of the Royal Institution held on the 3rd inst., Sir James Crichton-Brown (Treasurer and Vice-President) in the chair, Lord Kinnaird, Mr. A. F. Lindemann, and the Hon. W. J. Ward were elected members. The special thanks of the members were returned to Mr. Henry Vaughan for his donation of 20*l.*, and to Sir Henry Thompson, Bart., for his donation of 25*l.* to the Fund for the Promotion of Experimental Research at Low Temperatures. The cordial thanks of the members were returned to the Master and Wardens of the Merchant Taylors' Company, to the Lord Mayor and Lady Mayoress, to Dr. and Mrs. Mond, to Dr. and Mrs. Dewar, to Professor William Odling, and to the Teachers of Natural Science at Oxford, for their hospitality to the members and guests of the Royal Institution during the recent Centenary celebrations. The Managers reported that they had received gratifying assurances from their guests that the Centenary celebrations, as a whole, were highly appreciated, and considered not unworthy of the past history of the Royal Institution, and of good augury for that new century of scientific work to which it has now

to apply itself. Taus Professor Cornu, on his return to Paris, reported to the French Academy of Sciences as follows:—

"La Royal Institution of Great Britain, fondée en 1799 par Benjamin Thompson, Comte de Rumford, fêta les 5, 6, et 7 juin, le Centenaire de sa fondation; S.A.R. le Prince de Galles (Vice-Patron de l'Institution), a gracieusement demandé qu'on lui présentât nos confrères et leur a remis, dans l'une des séances commémoratives, le diplôme de membre honoraire de l'Institution Royale. Lord Rayleigh et M. James Dewar ont rappelé, dans deux remarquables Commemoration Lectures, les principales découvertes faites dans les laboratoires de l'Institution Royale, par Thomas Young, Sir Humphry Davy, Michael Faraday, John Tyndall.

"Les expériences les plus intéressantes ont été exécutées; en particulier, celles qui se rapportent à l'interférence des sons et à l'hydrogène liquide ont excité un véritable enthousiasme. Nous avons pu mesurer ainsi l'immense chemin parcouru depuis un siècle, grâce aux efforts déployés dans cette belle Institution.

"Enfin l'Université d'Oxford a convié tous les savants étrangers présents à Londres à visiter ses collèges, plus de cinq fois séculaires, qui renferment des richesses d'une valeur inestimable.

"Les deux Universités de Cambridge et d'Oxford ont témoigné à nos confrères leur sentiments d'estime et confraternité scientifiques en leur conférant des titres de docteur honoraire.

"Nous rapportons donc de notre séjour parmi les savants anglais non seulement l'impression de la plus cordiale hospitalité, mais encore une véritable admiration pour la manière dont ils cultivent et honorent la science. L'histoire de ces Universités, et particulièrement celle de l'Institution Royale de la Grande-Bretagne, offre un exemple bien instructif; on voit par quelle méthode une nation, jalouse de s'élever au premier rang du progrès scientifique, d'encourager les recherches élevées et d'en faire comprendre les applications, parvient au but qu'elle s'est proposé.

"Elle choisit à chaque époque les savants les plus illustres, leur donne à la fois l'indépendance et les moyens matériels sans lesquels aujourd'hui on ne saurait réaliser de grandes découvertes.

"Il y a là un sujet de méditations et d'études pour ceux qui ont l'honneur de diriger le mouvement scientifique et qui s'efforcent de maintenir notre pays au rang élevé que ses traditions lui imposent."

It is satisfactory to be able to report that the Centenary celebrations have not affected the pecuniary resources of the Royal Institution, as all expenses in connexion therewith have been defrayed by private contributions. A balance remaining over of the sums contributed, amounting to 87*l.*, has been paid over to the Fund for the Promotion of Experimental Research.

## Our Editorial Table.

VICOL P.O.P.

Manufactured by Berger & Co., South Hill Works, Hampstead, N.W.

We have received a sample packet of this printing-out paper, which, as we mentioned a fortnight ago, is used for the purpose of producing results in colours. The specimen print submitted to us is of a pleasing character, and shows that the process has great possibilities. The working instructions are as follows:—

*Printing* should be done in the shade, and carried out rather deeper than the finished print is required to be.

*First Washing*.—Before toning, wash the prints for ten minutes in gently running water, or in several changes.

*Alum Salt Bath*.—To harden the surface of prints, soak them, after the first washing, in

Alum .....	1 ounce,
Common salt .....	1 "
Water .....	20 ounces,

for five minutes, keeping them always in motion; then wash again for ten minutes, before toning.

*Toning*.—"Viccol" P.O.P., either matt or glossy surface, works very well in any ordinary toning bath. The following formula gives splendid results, and, if made up separately in well-stoppered bottles, the solutions will keep good for a long time:—

No. 1.	
Ammonium sulphocyanide .....	150 grains.
Water .....	15 ounces.
No. 2.	
Gold chloride .....	15 grains.
Distilled or boiled water .....	15 ounces.

For use, add 2 ounces of No. 1 to 16 ounces of water, and then add 2 ounces of No. 2. These quantities are sufficient to tone a 1*s.* packet of "Viccol" to a rich purple-black. The whole of the prints should be put into the bath at the same time, as nearly as possible, and kept in constant motion. Toning is complete in six to seven minutes.

*Fixing*.—After toning, wash the prints for five minutes, and then immerse for ten minutes in this fixing bath, which should always be freshly made: Hypo, 3 ounces, in 20 ounces water. After this, the prints must



be thoroughly washed for about one and a half hours either in gently running water or many changes.

The paper, whether matt or glossy, has a rose-tinted surface before toning and fixing, when it changes to a delicate mauve, the prints resembling ordinary photographs of fine quality. If desired, pure whites may be obtained by soaking the prints in a bath composed of 20 minims of A solution (see below) in 20 ounces of water.

The colours are produced as follows:—

After fixing and washing, press the prints between clean blotting-paper to remove superfluous moisture, and apply the following solutions with a camel's-hair brush to the parts it is desired to change:—

- |    |   |
|----|---|
| A. | For flesh tints, a 5 per cent. solution of citric acid. |
| B. | " reds " " " " boric "                                  |
| C. | " pink-yellow " " " " pyro. "                           |
| D. | " blue " " " " sodium hydrate.                          |

Solution A or C gives a realistic brown appearance to such subjects in the prints as tree-trunks, masonry, horses, &c. Solution D imparts a greenish effect to foliage, &c. After colouring, slightly rinse the prints under the tap in gently running water. Finish and mount in the usual way.

#### THE "CAMERA OBSCURA:" AN INTERNATIONAL PHOTOGRAPHIC REVIEW IN FOUR LANGUAGES

Published by Williams & Norgate, Henrietta-street, London, W.C.

We have received the first number of this publication. There are French, German, Dutch, and English sections, the latter being edited by Mr. Chapman Jones, who has secured the co-operation of Colonel Waterhouse, Mr. Hector Maclean, and other gentlemen as contributors to the number. The printing, illustrations, and get-up of the new magazine are very good; but we fancy it is hardly likely to appeal largely to English readers. Nevertheless, we wish it every success.

## News and Notes.

We are informed that Messrs. J. H. Dallmeyer (Limited) have just paid an interim dividend of twelve per cent. for the past six months.

**PHOTOGRAPHIC CLUB.**—Wednesday evening, July 26, at eight o'clock. Discussion, "The Extent to which Hand Work is permissible in Photography."

**THE AUSTIN-EDWARDS MONTHLY FILM NEGATIVE COMPETITION.**—The prize camera for the current month has been awarded to Mr. W. E. Hickling, 19, St. Stephen's-road, Leicester, for his negative, *Picking up the Pilot off Flushing*.

Mr. W. H. ASSENDEN, 3, Vestris-road, Forest-hill, S.E., writes: "I beg to request you to insert in your next issue the fact that I have withdrawn my name from the signatories of the Nottingham Incandescent Lime-cylinder Syndicate (Limited), of Egerton-street, Nottingham, and 385, Old Kent-road, London, and at the same time have ceased my connexion as traveller and agent of the said business."

**THE KODAK EXHIBIT AT THE CONVENTION.**—Among the exhibits of Messrs. Kodak, Limited, at the Convention, we noticed some very fine enlargements on Royal bromide paper, from 4x5 cartridge Kodak negatives, the subjects being as follows:—*Sunbury Lock*, by Mr. George Davison; *Wadby, Lifemint Scene*, and *Paul Lunge with his Kodak*, by Mr. F. M. Sutcliffe; *Horses*, by Colonel Gale; *Cattle*, by Dr. Grindrod; also a series of Gloucester Cathedral, and a fine set of direct prints on Solio and Dekko papers from 12x10 negatives by Messrs. W. & D. Downey. The entire exhibit attracted the close attention of the visitors.

**THE SANDELL "PERFECT" COMPETITIONS.**—The following are the results of the June competitions:—10l. prize, *A Message from over the Sea*, Mr. W. McLean, Belfast; 5l. prize, *The Forge*, Miss Mary C. Fair, Southampton; 1l. prizes, *Bubbles*, Mr. Albert Durr, Wotton-under-Edge; *Study of Girl in Sunlight*, Dr. Llewellyn Morgan, Liverpool; *Home Lessons*, Mr. T. Knox, Belfast; *Giddy A.P.*, Mr. F. W. Fielder, Foxenden, Dene-road, Guildford; three interiors, Mr. Harold Baker, Birmingham; *Gladiolas*, Mr. H. C. Leat, Bristol; two snap-shots, *Morning off Deptford*, *Evening off Greenwich*, Mr. T. K. Beaufort, Westminster; two snap-shots, *Evening on the Mersey*, Mr. E. A. Spivey, Colne, Lancashire; three interiors, *West Monmouthshire School*, Mr. H. Dunning, Usk; interior, *Falkland Palace*, Mr. J. Terras, Markinch, N.B.

**MESSRS. B. J. EDWARDS & CO.'S EMPLOYEES' OUTING.**—On Saturday last the *employees* of Messrs. B. J. Edwards & Co., The Grove, Hackney, took their annual outing. The place selected this year was Yarmouth, to which the party were conveyed by the Great Eastern Railway. Upon arrival, the company disported themselves as they thought fit; some took sea trips, others sea dips, whilst, again, others preferred the country, and went for a drive until they all met at a given time at the Bath Hotel, where a capital dinner awaited them, to which they all did ample justice. The head of the firm (Mr. B. J. Edwards) presided, and Mr. Thomas Cowderoy filled the vice-chair. After the cloth was removed, the usual loyal toasts were given by the Chairman, and then the toast of "Success to the Firm" was given in a neat little speech by the Vice-chairman, and suitably responded to by Mr. Edwards. Occasion was then taken to present to Mr. J. L. Newman a pair of solid gold sleeve links in recognition of his valuable services as Hon. Secretary to the outing fund, and his untiring exertions in bringing these outings to such successful terminations year by year. The company met again later for tea, and then made for home after a most enjoyable and pleasant day.

## Patent News.

THE following applications for Patents were made between July 3 and July 8, 1899:—

**TREATING PLATES AND FILMS.**—No. 13,832. "Improvements in Apparatus for Treating Photographic Plates and Films." W. P. WETHERED.

**ANIMATED PHOTOGRAPHY.**—No. 13,903. "An Improved Method of and Apparatus for Conducting certain Photographic Operations, principally applicable in connexion with Animated Photography." C. RALEIGH.

**WASHING PLATES.**—No. 13,987. "Improvements in or relating to Apparatus for use in Washing, Drying, or otherwise Treating Photographic Plates." Complete specification. G. GEIGER.

**THREE-COLOUR CAMERA.**—No. 14,021. "Camera for Three-colour Work." W. C. MASSER.

**SHUTTERS.**—No. 14,075. "Improvements in Photographic Shutters." THE THORNTON-PICKARD MANUFACTURING COMPANY (Limited) and C. G. WOODHEAD.

**EXPOSURE METERS.**—No. 14,070. "Improvements in Photographic Exposure Meters." A. WRIGHT.

**FILMS.**—No. 14,094. "Improvements in Photographic Films and in Apparatus for using same and connected therewith." J. E. THORNTON.

**CAMERAS AND TRIPODS.**—No. 14,102. "Improvements in or in connexion with Cameras and Camera Tripods." F. W. BRANSON.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
25.....	Ashton-under-Lyne.....	Excursion: Mow Cop for Morton Hall. Leader, Walter Leigh.
25.....	Birmingham Photo. Society ..	Social Evening.
25.....	Hackney.....	Exhibition of June Excursion Prints
26.....	Kingston-on-Thames.....	Excursion: Zoological Gardens. Leader, J. F. East.
26.....	Photographic Club.....	Discussion: The Extent to which Hand Work is Permissible in Photography.
26.....	West Surrey.....	Open Night
29.....	Birmingham Photo. Society ..	Excursion: Rugby and Dunchurch. Leader, R. Haines.
29.....	Borough Polytechnic.....	Excursion: Richmond Park. Leader, S. H. Kemble.
29.....	Hackney.....	Excursion: Zoological Gardens. Leader, W. L. Barker.
29.....	Oldham.....	Excursion: Vale Royal. Leader, James Brooks.
29.....	South London.....	Excursion: Eynsford. Leader, C. Churchill.
29.....	West London.....	Excursion: West Drayton.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 13.—Mr. F. W. Mundy in the chair.

Mr. A. L. Henderson sent up a couple of positives, showing what might be done in the direction of the utilisation of bad or light-struck plates. The first positive was on a light-struck bromide plate which had been printed out after treatment with a solution which, for experimental purposes, was composed as follows:—

Silver nitrate .....	10 grains,
Citric acid .....	5 "
Water .....	2 ounces,

with sufficient ammonia to redissolve the precipitate formed. The plate is dried in the dark, with no washing. After printing, the plate is washed in salt water, fixed, and toned in a gold and sulphocyanide bath.

Mr. A. HADDON thought that an ordinary bromide plate of any speed would be too coarse in grain to look well treated as had been described. A slow plate would do, but, of course, the point was the utilisation of old plates.

Mr. MACKIE said that bromide of silver would print out in the presence of free silver similarly to the other forms of silver.

Mr. J. A. SINCLAIR showed a negative on Sacco film, which presented no difficulties of manipulation and was easy to handle. He found it stripped off its support with ease, and took to its supplementary supporting piece of gelatinised paper without any trouble.

Mr. J. E. HODD thought the negative was rather granular in appearance. If the emulsion could be coated in the first place upon celluloid, from which it should just as freely strip, this drawback would be overcome.

### PHOTOGRAPHIC CLUB.

JULY 12.—Mr. W. R. Stretton in the chair.

A vote of sympathy with Mr. Child Bayley in his unfortunate accident at Gloucester was passed, on the proposition of Mr. FOXLEE, and the Secretary was authorised to write and give expression of the same in the name of the Club.

Mr. PERCIE T. EDWARDS sought some information on the question of photo-transfers for application to porcelain and for burning in on pottery. The original he had was an ordinary silver print, but he was not clear whether the transfers were to be simply for transfer, or whether they were to be such as could be burnt in upon pottery, &c.



Mr. FOXLEE said that the image must of necessity be in a vitreous pigment if the transfers were needed for burning in. Then, again, it was necessary to know the method of firing in to be followed. Some potteries fire in at a mild heat, and others at a great temperature.

The names of Messrs. Morgan & Kidd (of Richmond), Pendry (of Nottingham), Grundy (of Derby), &c., were mentioned as carrying on ceramic work.

Mr. FOXLEE, continuing, said that the transfers could be made by the carbon process, using a pigment of a vitreous character; or, as by Grundy's method, the collotype process could be used, and an image, in vitreous pigment, built up of several printings to give sufficient body to the result, be burnt in upon the desired article. Mr. Foxlee said that observers on railway stations, &c., would also have seen a method of burning in upon enamelled iron, by which some really good work had been done. Attempts at imitation of enamels had been made, and it would perhaps be remembered that at the last Crystal Palace Exhibition he showed a collodion transparency on clear glass which had been backed up and cemented upon a piece of opal, the margins being afterwards bevelled off. This made a very effective picture indeed.

Mr. HANS MÜLLER produced a print which he had seen made at the Royal Photographic Society's *Soirée* at 66, Russell-square, by the inkless electric printing machine. The paper, it may be said, is chemically prepared, and is placed in contact with the usual printing surface, when an electric current is passed through. The result is that the chemical is decomposed, and the type or block is imprinted upon the paper. The print in question had been in his pocket since its production, and, strange to relate, had gone to a deep muddy colour. No explanation was forthcoming, but the behaviour of the paper was considered peculiar. Another instance was mentioned in which a print had partly been exposed, and where so exposed had gone decidedly yellow, while the unexposed parts were unchanged.

### FORTHCOMING EXHIBITIONS.

1899.

- |                       |   |
|-----------------------|---|
| August .....          | One-and-All Flower Show at the Crystal Palace (Photographic Classes). Hon. Secretary, E. O. Greening, 3, Agar-street, Charing Cross, W.C. |
| Sept. 22-Nov. 4 ..... | Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.  |
| " 25-Nov. 11.....     | Royal Photographic Society. Hon. Secretary, Colonel J. Waterhouse, 12, Hanover-square, W.   |
| October 18-24 .....   | Croydon Camera Club.  |
| " 22-Nov. 19...       | Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.   |
| Nov. 27-Dec. 18 ..... | American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.     |
| December 7-9 .....    | Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.   |

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

### Correspondence.

\*.\* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\*.\* We do not undertake responsibility for the opinions expressed by our correspondents.

### KROMAZ COLOUR PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—We notice in a report of the Convention you mention, in connexion with our exhibit, that "Messrs. Watson & Sons showed Ives's kromaskop, which attracted the delighted attention of visitors." This is not correct. The colour process which we exhibited and explained was the "Kromaz colour photography," invented and patented by Barnard & Gowenlock, and for which we are sole agents.

As your description is likely to mislead many who examined and spoke very highly of the process, we shall be obliged by your kindly correcting the notice in your next week's issue.—We are, yours, &c.,  
W. WATSON & SONS.

313, High Holborn, London, W.C., July 17, 1899.

### CALCIUM CARBIDE.

To the EDITORS.

GENTLEMEN,—In answer to your correspondent, Mr. J. V. Robinson, I would suggest he sends his samples of calcic carbide and deposit, after generating acetylene gas, to some other specialist, if he wishes his own

opinion confirmed, or otherwise. Personally I can do nothing more, for I should hesitate to again approach Professor Vivian B. Lewes on the subject after his courtesy in once giving an opinion. Experts like him are busy men, whose time is of considerable value and who seldom give an opinion without receiving a substantial fee.—I am, yours, &c.

London, July 16, 1899.

GEORGE R. BAKER.

### BRAIN WAVES AND PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Will you kindly give an opportunity to the many artistic and other workers you, doubtless, have amongst your readers to express their views on the action of the brain waves excited in the operator by the object to be photographed in their action on the "conjugate foci;" for, as the optical relation between conjugate foci involves the reversal of the direction of the light, so may it be that the brain waves I am about to describe are themselves involved in the reversal of the direction of the light, thereby establishing a definite individual relation between the operator and the object. Then, of course, it will be obvious that, as the brain waves thus take an actual part in the production of the picture, so will each definite individual feeling in the brain be expressed in the picture. It should, therefore, follow that an indispensable condition of a good photograph is that the operators should form, as nearly as possible, a perfect conception of the object, and then bear that conception in mind as intensively as possible. The production of the brain waves for the purposes of thus affecting a photographic plate may be described as incident in the larynx, continuously as nearly as may be, and analogous to the heating, luminous, and chemical action the discharge of each impulse liberates, by means of which each impulse gives to the vibrations in the larynx its individual pitch, which is emergent from the sympathetic movements of the oral cavity of the mouth, tongue, and lips, whose slight, silent movements conjugate, continuously as nearly as may be; the vowels and consonants forming the silent symbols in which the brain thinks of each impulse, into undulations of invisible light, whose vibrations, with the velocity of light, and the wave-length given by each impulse, form conjugate foci to the rays from the object to be photographed, for the reason that the light which the oral cavity of the mouth, tongue, and lips conjugate correspond in their vibrations to the picture which the object has formed on the brain of the operator; that is, the frequency of the emergent vibrations (wave-length) from the oral cavity of the mouth, tongue, and lips correspond to the frequency of the vibrations (wave-length) from the object, as seen by the brain of the operator. That the oral cavity of the mouth, tongue, and lips do conjugate the vowels and consonants which form the symbols or silent speech in which the brain thinks, may be experienced by any person who will quietly observe himself. For example, I feel myself conjugate each letter and each word I am now engaged in writing. But this silent faculty of speech is co-extensive with each and all mental and bodily movement whatever. So that, such being the case, then the emergent sympathetic waves (all things being equal) are indispensable to the production of a good picture, and may be said to form both the physiological and psychological bases of the quality of the picture.

Trusting that you may consider the above of interest to your numerous readers,—I am, yours, &c.,  
WM. CLIHAN.

2, Brunswick terrace, Victoria-road, Bowden, Cheshire.

[Agreeably to our correspondent's request, we insert his letter, but we must not be understood as supporting his somewhat curious theories.—EDS.]

### Answers to Correspondents.

\*.\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\*.\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

- L. Varney, Bridge-street, Buckingham.—Photograph of 1st Bucks Rifle Volunteers.
- C. Mayne Clark, 2, Station-parade, Exmouth.—Two photographs of kitten with two faces.
- W. M. Sweetman, 23, Chesham-flats, Duke-street, W.—Four Photographs of Rev. Father Ignatius.
- T. Wallace, Eskbank-road, Dalkeith.—Photograph of H.R.H. the Prince of Wales and party at Dalkeith.
- B. T. Watson, 461, Anlaby-road, Hull.—Photograph of Australian cricketers. Photograph of English cricketing team.

B. MCGRATH.—We see nothing to object to in the advertisement.

BAS-RELIEF.—R. Pietzner, Vienna; The Taber Bas-relief Co., 141, New Bond-street, W.

"NOVITAS."—The address of the firm who supply the paper is Scholz, Binsfeld-road, Clapham, S.W.



**EAGER.**—If you registered your photograph, you are in a position to make a claim—not otherwise.

**INDIA.**—1. South Africa would be about your best ground. 2. Encaustic paste [see formulae in our ALMANAC].

**W. L. BERRY.**—We believe the firm to be respectable, but, if you have any doubts on the matter, why not adopt the deposit system?

**H. SHIRINGTON.**—We have no personal knowledge of the firm. Sorry we cannot help in the matter. It must be obvious to you that we cannot be responsible for the *bona fides* of every advertiser in the JOURNAL.

**WOOD'S DIFFRACTION GRATINGS.**—A. F. J. R. says: "Will you kindly inform me whether the diffraction gratings as described by Professor Wood are on sale in England, and, if so, their price?"—Not obtainable yet, so far as we know.

**DARK ROOMS IN IRELAND.**—CELTIC asks: "Could you tell me if there are any dark rooms in Drogheda, Navan, Kells, Trim, or anywhere within a few miles from these places?"—Will some Irish reader oblige with the information?

**ENLARGED NEGATIVES.**—INQUIRER asks: "Would you kindly say if you consider that an enlarged transparency and the contact-printed enlarged negative could be successfully produced by the use of negative paper?"—Yes; but, of course, the grain of the paper would be apparent in the finished result, though not offensively so.

**RECOVERING GOLD.**—R. T. W. says: "Could you oblige with the best way to get the gold out of the sulphocyanide bath?"—The most economical way of getting the gold out of the bath is to exhaust it by toning prints in it. The gold may, however, be precipitated by a solution of the protosulphate of iron, as from any other toning bath.

**STEREOSCOPIC PHOTOGRAPHY.**—M. M. LAHIRI says: "Will you kindly let me know—(1) where I can get cheap American stereoscopes, and also (2) whether Theodore Brow's stereoscopic transmitter, advertised in your JOURNAL of May 19, p. 17, can produce good stereoscopic pictures?"—In reply. 1. Of S. Guiterman & Co., 35, Aldermanbury. 2. Yes.

**STARTING IN BUSINESS.**—VQUIP says: "I have started photography professionally, and should feel greatly obliged if you could give me some good practicable ideas how to work a portrait club, and a good method of canvassing; also, is it customary to appoint agents? if so, at what commission are they usually paid?"—Some reader may be able to help.

**'SUN' DARK SLIDES.**—E. WATZLAFF says: "I should be so pleased if you could let me know where I could get double dark slides made by the 'Sun' Camera Co. Lim., Leeds? A letter addressed to that address came back with the remark 'not known at that address,' and, as my camera has been made there, I thought it might be best to get the extra slides from the same place."—In reply: Try Lonsdale Brothers, 22, Goswell-road, E.C.

**S TICKY NEGATIVE VARNISH.**—J. D. F. replies: "I have a lot of negative varnish which has become sticky; whilst printing I can hardly get the prints from it. What is the best to do with it to remedy stickiness? also to thin the varnish?"—As the composition of the varnish is not stated, we can give no advice. We should say, however, that the best thing to do would be to discard it altogether. Possibly it may be thinned with methylated alcohol.

**ANAGLYPHS.**—"SOLID" says: "In a recent number of the JOURNAL you commented on the anaglyph, and stated that it owes its origin to Du Hauron. Could you kindly favour me by informing me whether there is any publication from which I can obtain particulars by Du Hauron or others on the principle of the anaglyph?"—In reply: *La Triplique Photographique des Couleurs*, by A. Ducos du Hauron, published in French by Gauthier Villars et Fils, Quai des Grands Augustins, 55, Paris.

**PHOTOGRAPHS OF CRYSTALLISATION PROCESS.**—R. FRANCIS says: "I wish to take some instantaneous photographs of the process of crystallisation from a colourless solution poured on to a glass plate and allowed to evaporate spontaneously. They are for educational lantern slides, and I find it difficult to light them so as to get sufficient contrast. Can you advise me as to the best method? The space to be included is about two inches square."—We should recommend you to get an elementary treatise on the microscope, as the subject is too long a one to be usefully dealt with in this column.

**CRIPPLE** writes: "Thanks for your reply. The notice was not given by the owner's solicitor, but from the man I took the house of, a builder, who was then the owner. 1. Have I not a right to be instructed by the new owner or solicitor before paying any more rent? I have paid two quarters' rent since he sold the house. 2. Would it not cancel the notice, he not being a solicitor?"—1. No. As you have been paying the rent to the one who let you the premises, pay it to him now, as you have received no notice from the new owner to the contrary. 2. Not under the circumstances, particularly as you formally accepted the notice to quit.

**BICHROMATE POISONING.**—RASH says: "I have recently been doing a little carbon printing—made about a couple of dozen half-plate pictures, perhaps a few more—and since then I have had a rash on my back, which itches and smart most annoyingly. Can you tell me of a remedy, or how to avoid the ill effects of the bichromate in the future?"—We should say that the bichromate has nothing whatever to do with the rash, and its cause should be sought for elsewhere. The ill effects of the salt are confined to the parts that come in contact with the solution, and rarely, if ever, extend beyond. It is also pretty certain that no trouble would accrue from so limited a use of the carbon process.

**LENS QUERY.**—A CONSTANT READER OF THE JOURNAL asks: "What sort of a lens would you recommend me for a studio which is only twenty feet long? As I like to go in for high-class portraiture, the question is, Will I be able to produce good work in so small a place? Also, would it be advisable to have one camera for the studio and outdoor work, as I cannot afford to buy two sets? I am not quite certain about the size of studio; I may be able to have it up to twenty-seven feet perhaps. I should like to have a lens which would cover from a cabinet up to 15×12 for the studio."—In a studio of only twenty feet long lenses of short foci must be used, and unpleasant perspective put up with. Even in a studio twenty-seven feet long it will be impossible to use a lens that will cover 15×12 for full-length cabinet portraits. We should recommend two lenses, one specially constructed for cabinets, say, eleven or twelve inches focus, and the other for larger size. One camera will answer for both purposes.

**ENGRAVING SMALL ARTICLES.**—BRASS writes: "I beg to ask for a little assistance, if possible, through the columns of your estimable paper. I have a considerable number of small metal articles to engrave. To engrave them by hand will take me too long, as I have only a short time to get them done. Can you tell me how to do them by some photo process quickly, and cheaply if possible? If there is any process described in the back volumes of the JOURNAL, I shall be extremely grateful for the information."—The kind of "small articles" to be engraved is not mentioned. Photo-engraving processes are principally confined to flat surfaces, and the small articles are probably not such. If our correspondent has had no experience in the photo-engraving processes, he will probably find that engraving by hand will be the quickest and cheapest method to him, as it would, in all probability, take him very much longer to make himself proficient in photo-engraving than to do the work in the ordinary way.

**A BUSINESS MATTER.**—PHOTO-ARTIST writes: "I should be glad if you could find space in your next issue to answer the following: I have had an assistant who has had charge of a branch studio for me. He has left me, and started business for himself in the same town. He has been exposing prints in his show-case taken at my studio, and he also has had men canvassing for orders with specimens taken at my studio; they have been taken and finished by him, but I have never given him permission to use any of the prints, which are from negatives in my possession, and which he has taken away without my knowledge and permission. Could you oblige by telling me what remedy I have, as I find he is doing me considerable harm by going round to all my former customers and telling them that the photographs are all his own taking?"—If the prints were made from your negatives, in your time, and with your materials, without your permission, we should say the man can be proceeded against criminally, for it is nothing less than theft. Before proceeding, however, we should advise you to consult your solicitor.

**DEVELOPMENT AND PRINTING.**—ESPERANCE says: "1. I find that some of my negatives present a mottled appearance, due, I understand, to imperfect washing after the alum bath. Is this injurious to the negative, and will it produce fading? If so, can it be in any way removed? The mottled appearance is scarcely noticeable in the prints. 2. Is there any means of removing pyro stains from the hands, and especially from the nails? 3. Can you give me some information as to the use of matt and glossy papers in printing? I am using Solio (5×4) at present, both glossy and matt. The latter, however, seems to be unsuitable for most negatives, especially if detailed or architectural. Is the use of glossy or matt surfaces solely a question of taste?"—1. Mottling may be due to several causes. Not rocking the dish during development is a very general cause. Without seeing the negatives we could not give a decided opinion. 2. The stains can generally be removed by moistening the parts with an acid, such as citric, oxalic, dilute hydrochloric, &c. 3. Simply a matter of taste. A matt or rough surface paper is not so well suited for small negatives with fine detail as one with a more glossy surface.

**REVERSAL.**—ALBERT ENGLAND says: "Will you kindly inform me in your JOURNAL what is the cause of reversal of image, and how can it be avoided? I had some interiors to take, and used —'s plates, developed according to their own formula. They were not backed. As I wrote to them on the subject, and they said there was no use in doing so, I took a room with windows at the end, fairly lighted, and gave twenty minutes' stop, f/22, Ross-Zeiss lens. I took some more same day at the same house, and did not get reversal in these cases. The window was not open to the sky, there being trees in front of it, yet the whole window is reversed. As you will see, it was not over-exposed in the shadows; in fact, I took the same room a few days before under the same conditions, and gave about eleven minutes, but it was very much under-exposed. Would backing have stopped it? Any particulars you can, give me, and, if you can refer to any work that I can get on the subject, I shall feel obliged."—The reversal is brought about by over-exposure of the window. The remedy is to subdue the light coming through it, give less exposure, and develop tentatively, so as to get out all the detail before the negative acquires too great a density. There can be no harm in backing the plates, though the makers say there is no necessity for it.

\* \* Several answers to correspondents unavoidably held over.

#### NOTICE.

With the present number of the JOURNAL we issue a half-tone print of the group of members of the Fourteenth Annual Photographic Convention of the United Kingdom, assembled at Gloucester during the week July 10-15, 1899. The negative was taken by Mr. A. H. Pitcher, of Gloucester. A key and list of names will be published next week.



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## EX CATHEDRA.

At the offices of Messrs. W. H. Ward & Co., 119, Shaftesbury-avenue, W.C., there were given this week demonstrations of a new machine for employment in colour printing, the invention of Mr. Ivan Orloff, Chief Engineer and Manager of the Russian Government Printing Works at St. Petersburg. The salient points of the new machine are thus indicated: In colour printing by the ordinary method the successive colours are applied one at a time as the preceding one becomes dry. The Orloff machine puts down all the colours at once, and as quickly as a single colour could be printed by the old means. It is claimed that not only does the Orloff machine print quicker, but the work is superior as regards "register" to anything ever produced by the usual means. For the first time in the history of colour printing, the colours are not only applied to the paper simultaneously, but with such perfect "register" that in any number of impressions no two copies will differ from each other.

\* \* \*

MOREOVER, it is pointed out that one of the difficulties in ordinary colour printing is the slight shrinkage and expansion

of the sheets of paper between the times of applying the successive colours, owing to the continual variations of temperature and moisture in the air, which affect the measurement of the sheet by several millimetres, more or less, and make perfect "register" impossible. The Orloff machine overcomes this difficulty entirely, and also makes perfect "register," no matter how thin the paper used. The Orloff machine was designed to print elaborate multi-coloured patterns to prevent the possibility of forgery by photographic agency. All other bank notes can be so perfectly copied, by this means as to defy detection. The Russian notes have elaborate interlaced designs made up of fine lines, which have the most intricate variations of colour, so perfectly printed that no two notes in a million are found to vary in the disposition of their interlaced patterns.

\* \* \*

THE prospectus adds that the perfection required for the printing of such bank notes has rendered the Orloff machine available for artistic as well as commercial colour printing. No such prospect was within the view of the Russian authorities when they encouraged the inventor (who was not a printer, but a weaver) to make the attempt to produce unforgeable notes, but the reward was held out that he would be at liberty to realise his invention by patents for other countries if he succeeded in his task. As yet the Orloff machine has been in operation only in the Imperial Printing Works at St. Petersburg, within the walls of which it was invented, and where there are now thirty-two of these machines in full work, each producing at the rate of 800 to 1000 sheets per hour of the new issue of the Russian paper money, and also bank notes for the Chinese Government.

\* \* \*

So far the prospectus. What we actually saw was this: A block for each colour is attached to a large revolving cylinder, and, when the machine is set in motion, by an elaborate system of gearing the different rollers apply to each block its own particular colour. When all the blocks, save the one which is to give the final impression, are inked, the colours from these blocks are laid down on what appears to be a gelatine roller brought into contact with them, and from that roller the deposits of colour are transferred to the actual printing block, and thence to the paper by cylindrical movement. Examina-



tion of a number of prints, containing no less than seven different colours, showed that the results were perfectly in register. The Orloff machine is a massive piece of engineering construction, and it appears to do its work exceedingly well and quickly. The results we saw were produced from hand-engraved blocks in metal, but it is anticipated that half-tone work and photogravure will be produced from the machine. The registration appears to be faultless, and, so far as we are able to judge, the machine should have a great future before it in colour printing.

\* \* \*

THE last sitting of the session of the Select Committee of the House of Lords on the Copyright (Artistic) Bill was held last week, Lord Monkswell presiding. Mr. Herbert Bentwich, solicitor, expressed his opinion that there should be a distinction between photographs and works of fine art, with the exception that photographs of works of art should have the same term of protection as the original works; photographs taken from nature should have a shorter term; photographs should not be included in works of fine art. He emphasised the hardship of the proposed registration requirements on owners of small works, such as Christmas cards and advertisement drawings, and suggested that a mark on each card, &c., giving the date of publication, the name of the owner, and the fact that copyright was claimed, should be sufficient. The Chairman announced that this would conclude the evidence for this session, and that he hoped the Committee would be re-appointed next session.

\* \* \*

Our contemporary, *Anthony's Bulletin*, contains particulars of a decision, in regard to the photographing of criminals and placing their pictures in the New York Rogues' Gallery, which has lately been rendered by Justice Truax in the Supreme Court of the United States. He was asked to grant a writ of peremptory mandamus to restrain the Police Commissioners from taking the picture of one Thomas Joyce, and placing it in the Rogues' Gallery, after the said Joyce had been convicted of an assault and sentenced to six months in the workhouse. It being shown in response that Joyce had formerly been arrested, and that he was an associate of criminals, the application was denied, Justice Truax holding that these facts were sufficient to warrant the action of the Commissioners. In giving his decision, Justice Truax quoted Professor Tiedeman's treatise on the limitations of police power, as follows: "Another phase of police supervision is that of photographing alleged criminals and sending copies of the photographs to all detective bureaux. If this be directed by the law as punishment for a crime of which the criminal stands convicted, or if the man is, in fact, a criminal, there can be no constitutional or legal objection to the act, for no right has been violated."

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JUSTICE TRUAX proceeds to say that, under the Consolidation Act of the city, the duties of the police were, among other things, to preserve the public peace, prevent crime, detect and arrest offenders, and protect the rights of person and property, holding that one of the ways to carry out this end is to know who are the habitual criminals, and that the easiest way for the recognition of such is by their photographs, and, in view of the preceding, he held that, if any wrong had been done the relator, it was in the nature of a libel, for which an adequate

remedy at law is provided. We have not heard of a case analogous to this in Great Britain. Mr. William Sikes, we take it, is not troubled by such qualms of delicacy as his American congener, and we doubt, if he took it into his head to object to his photograph being included in the archives of Scotland-yard, whether there would be a probability of an English Judge seriously considering such an objection. The English law has a tendency to over-nicety in its treatment of criminals, but the line has to be drawn somewhere, and we think it should be drawn at excessive-scrupulosity in the matter of exhibiting the portraits of convicted criminals.

\* \* \*

We have frequently published extracts from the advertisement columns of our Antipodean contemporaries indicating the *bizarre* business methods of Australasian photographers, and illustrating the absurd lengths to which price-cutting is carried. A friend now favours us with copies of two advertisements which lately appeared in the *Sydney Morning Herald*, which show that there is still a lower deep than those we have previously explored. The first runs: "Eden: the leading photographer. The volume of business done at the Eden Photo Studios has been increasing by leaps and bounds beyond all anticipations, and, large as the new premises are, they have proved too small for the coping with such a rush of orders as were lately given at the studios, and for the first time in our Sydney history we had to disappoint our customers by keeping them waiting for their portraits; but this trouble is all over now, and we have made more extensive arrangements for the future. There are two reasons for the greatness of our custom—the first is that we spare no expense on our establishment and the production of first-class work; and, secondly, that in fixing our prices we do not consider how much profit we can get, but how little we can do with, and as a consequence our prices are (as most people who write their testimonials of our work state) a marvel of cheapness. Years ago photography was considered so high a profession that a photographer would almost want a guinea profit to look and say which side of your face was best to be photographed. Now, since the introduction of dry plates, bromide papers, &c., the work has become so simple (*sic*) that it seems the last resort of the commercial failure to *become a photographer*. Mr. Eden has given consideration to the fact that, as photography has become a trade, it is only deserving of trade profits, and thus the prices at the Eden Photo Studios are considerably lower than any other respectable house in Sydney."

\* \* \*

THIS advertisement admits of a variety of interpretations. One of them, the most obvious, can scarcely advantage either Mr. Eden or his profession, for it is a hint to all the weeds and wastrels of commercial life to take up professional photography in the expectation of doing what Mr. Eden boasts of doing, *viz.*, a business which advances by leaps and bounds. But there is something more. Mr. Eden's photographic business is advancing by such great leaps and bounds that he has made an addition to it in the shape of a tailoring department. He says: "If you want to dress well and at a small cost, then you should go to the Eden Tailoring Company, at the Eden Photo Studios' new building. You can make your choice from the very best of materials, and, after our first-class cutters have measured you, the suit is hand-made in the very best style. Bear in mind this is not a



factory-made suit, but made by men who are paid the low prices for hand work. Mr. Eden pledges his reputation on these suits being as good as what one usually pays from four to five guineas for, and yet the Eden Tailoring Company only charge 57s. 6d. for the whole suit. It will pay city gents to visit us." Only a few weeks ago we quoted from a Sydney contemporary a lamentation that it seemed difficult, if not impossible, to raise the status of Australasian professional photography. Can it be wondered at?

\* \* \*

THE use and abuse of lenses in taking large direct portraits is touched upon in our leading article this week.—Mr. Alfred Watkins describes an interesting application of his well-known method of development by time, or without light, to the manipulation of colour-sensitive plates.—The Kromaz, the newest system of colour photography by means of stereoscopic transparencies, now being introduced by Messrs. Watson & Sons, of 313, Holborn, London, is described.—We also print full instructions for the development and manipulation of Messrs. Wellington & Ward's new "dry" stripping film.—"Adurol" forms the subject of a brief report by Dr. J. M. Eder, who, in comparing it with hydroquinone, gives the advantages to the newer reagent.—Some little interest may attach to the method of printing from unfixed negatives described by Herr Goldschmidt; but the idea is not a new one, and in our opinion is not patentable.—With this number of the JOURNAL we also issue a numbered key to the Convention group given last week. Will those gentlemen who helped us with some of the names kindly accept our thanks for their co-operation?

### LARGE DIRECT PORTRAITURE.

At one of the recent meetings of the Photographic Club, when reference was made to some large direct portraits on plates 20 × 16, by Mr. Witcomb, of Buenos Ayres, a remark was made that there was a greater difficulty in getting orders for large direct work than there was in executing it. Mr. Snowden Ward, in reply, said that in the United States large direct photographs were much favoured. We know also that there is a considerable business done in them on the Continent—France, Germany, and elsewhere. Seeing that large direct portraiture is so much in favour, alike in the States, on the Continent, and in the Argentine, and we are told by opticians, and also by dealers in second-hand apparatus, that the majority of the large lenses for portraiture they sell are for export, and not for home use, it will be well to inquire why this is the case.

It must be admitted that a good large direct picture—up to a certain size—has a delicacy and charm about it that is not possessed by an enlargement. Perhaps one reason why there is so little demand for this class of portrait here is that English photographers do not make such a feature of them as do their confrères abroad. Another reason, and probably a greater one, is that, when a feature has been made of them here, they have not been so pleasing in character as are those of the smaller sizes, owing to the violence of the perspective, caused by the camera being brought too close to the sitter through the use of lenses of too short foci, a thing studiously avoided in the States and on the Continent. This subject has frequently been dealt with in our back volumes.

Many photographers here make the mistake of using lenses on the full-size plates they will cover; although they do this with the larger sizes, they do not do so with the smaller ones, or, at least, to the same extent. For example, the most general lens for cabinets, the size of which is  $5\frac{1}{2} \times 4$  inches, is one of from 11 to 12 inches equivalent focus, and when used for this size the perspective is pleasing, and this very largely conduces to the popularity of the cabinet picture; but, as most are aware, a good lens of that focus will cover a much larger plate when moderately stopped down.

The late Mr. J. H. Dallmeyer laid it down as a rule, some thirty years ago, that the equivalent focus of a lens should be at least double the longest dimensions of the plate upon which it is used, and that has never been controverted. The famous portraits by M. Adam Salomon, which created such a *furor* in the "sixties," were about 10 × 8 inches, for example, and were all taken with a lens of 20-inches focus. Now, what applies in the case of small pictures applies also, and in a greater degree, to large ones.

Keeping these facts in mind, we will now see how opticians catalogue their large lenses. We have now before us the catalogues of our two leading opticians, Ross and Dallmeyer. In each of these are quoted lenses, suitable for portraiture, in three series: the portrait combination; the "D" group or universal; and the rapid rectilinear or symmetrical of almost, in each list, identical foci, and to cover similar size plates. We will quote from the latter's catalogue, because in it the equivalent focus of the portrait lens is given, while in the other the back focus only is mentioned. We find there a portrait lens of 30 inches focus, a "D," or group lens, of  $30\frac{1}{2}$  inches, and a rapid rectilinear of 30 inches focus, so that, practically, the three lenses are of identical foci. The first-named is catalogued to cover 20 × 16, the second 18 × 16 to 22 × 20, and the third similar sizes, and the reputations of the two makers are sufficient to guarantee that they will cover the sizes stated; but should photographers use them for the full-size plates?

Bearing in mind what has been said with regard to the smaller sizes, say the cabinet, neither of these lenses should be employed for plates larger than 15 × 12 if we wish to obtain pleasing results, so far as perspective is concerned, and it may be mentioned that as to the size, we find upon inquiry, they are used for abroad, where large direct portraits find favour with the public. When used for sizes of half the focal length of the lens, the camera is placed at a considerable distance from the sitter, and a pleasing perspective is obtained. When, however, the lens is used for the larger size it is capable of covering, the camera has to be approached very close indeed to the subject, perhaps to within 6 or 8 feet, with the result of violent and unpleasant, though still true, perspective, the foremost portions of the features and figure appearing to be distorted.

Our older readers will remember that, some five-and-twenty years ago, the late Mr. Crawshaw, with the laudable intention of encouraging large direct portraiture—though he was ill advised in the matter—offered some very handsome prizes: fifty pounds for the best life-size portrait taken direct, and twenty-five pounds for the second best, and other prizes for smaller sizes. They will also remember, when the portraits were shown, the comments that were made upon them by the press generally, and the terms used with regard to them being such as, "monstrosities," "caricatures," "hideous," &c. This was not to be wondered at, when it is considered that to pro-



duce a life-size portrait the lens must be at the same distance from the sitter that it is from the focussing screen of the camera. Now, we believe that the lenses mostly used for these portraits were about 36 inches focus, hence it will be seen that the camera had to be brought to within 6 feet of the sitter, therefore there was little to surprise at the terms applied to the result.

The object here has been to point out that the reason why direct portraiture finds so little favour here is that many who have essayed it have made the mistake of using lenses on plates the full size that opticians make them to cover. In doing that, the camera has to be placed very close to the sitter, thus getting very unpleasant results; whereas, if it were placed, say, 15 or 20 feet away, the same pleasing picture, as cabinets are, would be obtained.

We intended to have said something on the most suitable lenses for large direct portraiture, but that must be deferred till a future occasion.

**Foci of Lenses Altered by Heat.**—One of the factors affecting the performances of lenses that have received little recognition is the action of heat in altering their foci. Professor Barnard has made a number of measurements bearing upon the subject, so as to ascertain if any possible change would necessitate corrections in specially delicate investigations. During the last year observations of the focus have been made at temperatures varying between 22° below and 80° above zero (a range of 102°). The means of the various observations made, extending over nineteen nights, showed a decided difference in the focus, it being found that the object-glass shortened .26 more than the steel tube which carried it. Micrometric measurements were made of the differences of declination between certain stars showing a difference of nearly .2" when observed in July to September and January and February. The net result is the decision announced by Professor Barnard that in exact work the differences so produced by temperature ought to be taken into account.

As regards the altering of the figure of an optical arrangement, it may be noted that, with the huge telescope which is in course of construction for the Paris Exposition, the mirror, about six feet wide, is so affected by the merest heat of the hand placed on it for a few seconds, that, when the image of a round luminous point reflected from it is examined by a telescope, a distinct deformation of the image is produced.

THE telescope in question is to be sixty metres long, but no deformation of the image by flexure will be produced, as the telescope tube will be placed horizontally on the ground and the moon or star under examination reflected into the tube by the mirror referred to. There should be some record photographs of the moon taken by it, and the value of such photographs is well known, for the power of the instrument will be such as, in popular parlance, to bring the moon within a distance of thirty-six and a half miles.

**Preservation of Rubber Goods.**—Every one familiar with vulcanised rubber articles, chemical gloves, for development and so forth, is aware that they are liable to deterioration and, at times, to become absolutely useless if kept for some time without being used. A writer in a scientific contemporary states that he found that in the Western States of America, where the deteriorating action of time referred to seems to be intensified by the extremely dry condition of the atmosphere, it is the custom to keep such articles wholly immersed in weak ammonia solution.

**Deterioration of Aluminium.**—The use of aluminium in photography is mainly confined to lenses and fittings, though it has been recommended for dishes or trays for various operations of the dark room. A report presented to the French Academy of Sciences by M. Ditte some time ago tended to show that it is very unsuitable for all utensils intended to contain liquids, and, although his research more particularly referred to cooking utensils, it is obvious that similar results must obtain when the metal was employed for liquids in photographic processes. Thus, he found that weak acetic acid quickly acted upon, but water alone sufficed to dissolve, it. In the Madagascar expedition large tanks of aluminium were employed for storing ordinary drinking water in, and it was found that they quickly became pitted with holes. On the other hand, M. Moissan, a great authority on such questions, traverses M. Ditte's report. He points out that the aluminium vessels supplied were made in the early stage of the industry, in the working of that metal, and were very far from being pure aluminium, a condition of affairs known to greatly favour corrosion. M. Moissan also points out that this metal readily forms an electrolytic couple with almost any other metal, and that the pitting referred to was owing to undoubted electrical action the tank frames in contact with the aluminium thus setting up action that resulted in solution of the sides of the vessel. An interesting discussion took place between the two eminent authorities, the result being the conclusion that, so long as contact with the other metals was avoided, the use of pure aluminium for household or military utensils would not be attended with any possibility of danger or inconvenience.

#### JOTTINGS.

"To sit on rocks, to muse by flood and fell," borrowing a line from Byron—probably the greatest and most human poet of the century—has been an unrealisable ambition of mine all this blazing hot July; and in that ambition and the impossibility of gratifying it no doubt I have many, many companions. It has been too hot for anything but the application of Sydney Smith's formula, "Take off your flesh and sit in your bones." Some of us would have been glad of the opportunity of doing this at Gloucester. But—it could not be done. The man of all others whom I have pitied during the last few weeks has been the dark-room hand, whose duty it has been to develop 60, 70, 80, or 90 negatives of an afternoon and evening in an ammonia-laden atmosphere, with the thermometer at 80° or 90°. These things have been done; they must be done.

It has been hot work, too, in some of the studios for sitters and takers alike. Here is an idea: Some years ago, when we were blessed with a spell of warm, fine weather, performances of plays in the open air were revived, and ever since then they have been given at frequent intervals. Don't you think some of our advanced and aspiring young photographers might borrow a hint from this and institute open-air studios? What could be more delightful to a fashionable Belgravian maid or matron, clad in the choicest gown of her favourite *modiste* than the opportunity of having her portrait taken *en plein air* in some delightful old-world garden in the "old court suburb" of Kensington, or any other attractive part of London. What scope it would give for effects in lighting, posing, and natural backgrounds!

Too hot to talk, as well as to work. The great rush out of London has peopled the meeting rooms of the photographic societies with a beggarly array of empty benches *plus* a few dismal persons whom duty obliges to keep on the treadmill. The treadmill of honest labour is what I mean, of course. Even at the Camera Club, that charming home of photographic dilettantism, a man who could show any interest in practical photography during the last few weeks would be looked upon as a curiosity, a fitting object for the R.P.S. museum. And the great doors of the baronial halls in Russell-square are closed; the voice of the loquacious Councillor is hushed; the Exhibition Committee has ceased from troubling for the present, and the Hon. Secretary is at rest (*pro tem.*). So, even in those



haunts of photographers who, unlike my friend Mr. Cooke, prefer to talk rather than to do, the "L and P" and the Club, an almost monastic silence prevails. Everybody is doing nothing and nobody is doing anything.

Now, all this is what comes of a Convention at Gloucester. The languorous charm of the place seems to attach itself to you, if not to imbue you with its own irresistible subtlety. It appears to be always afternoon in the western city. I never met a courtlier, slower, sunnier, more contented set of people than these same Gloucesterians. I suppose it was contact with our mild-mannered hosts which was responsible for what I call an outbreak of "Ye-e-s-old-chap"-ishness (spoken with a *blasé* kind of drawl) amongst many Conventioneers, who on ordinary occasions are not given to affectations of this kind. However, this was the only flaw, if flaw it be, in an otherwise flawless week. The tale of Gloucester has already been fully told, and needs no retelling. Newcastle will keep till next year. Meanwhile may I make a suggestion to Gloucester Conventioneers? Many promises of prints were made a fortnight ago. For the credit of the Convention, and wherever practicable, let those promises be kept. It should be done.

A very old institution with exhibiting photographers has just died the death; I allude to the Royal Cornwall Polytechnic Exhibition at Falmouth, the photographic section of which will not be held this year, at any rate. Time was when a medal at Falmouth was deeply coveted by photographers of the highest eminence; and, in the early gelatine days, those firms upon whose plates prize pictures were taken were greatly elated at their success. Messrs. Wratten and Messrs. Fry, I believe, secured Falmouth medals, and held them in considerable esteem. It is to be hoped that the Exhibition will be revived in a staple form, as there is surely scope for an annual photographic display in the great tract of country to the south of Exeter. Perhaps my old friend, Mr. C. K. Rowe, who, I perceive, has been busy judging photographic competitions in Devonshire, might be of assistance in the matter.

"Secco" film is, I believe, on the point of appearing as a company, the prospectus already being in private circulation. There is such a vast demand for flexible films in photography, and Secco, what I have seen of it, is so good that there should be no difficulty in floating the company. I hear, too, that the Premo camera is to be made the subject of a flotation. For American-made cameras the English appetite appears to be insatiable. Why is it that our home manufacturers are so slow in putting down plant to turn out apparatus of this character? I think the American camera-makers deserve all the success they are meeting with; but it is a somewhat sombre reflection on British enterprise that, so far, nothing of the sort has been attempted this side of the Atlantic. If the English photographer seriously pondered upon the extent to which he is dependent on our friends the foreigners for the means of practising his art, he would blush at the sting his patriotism must constantly receive.

To those photographers whose eyes at this season of the year begin to turn towards the autumn exhibitions, and who have not made up their minds what kind of work to attempt for sending in, I am anxious to give a hint which I hope may be useful. It is this. Keep an eye on narrative or dramatic photography. Some years ago a great friend of mine, Mr. A. G. Tagliaferro, produced some really splendid work of this character. At his home, Malta, he had command of some incomparably plastic sitters, and by their aid and that of specially built up scenery he produced a series of narrative, genre, or dramatic photographs the like of which have not been produced by anybody save Rejlander. Tagliaferro's photographs each told a complete story as distinctly and clearly as Orchardson's pictures, and, in their way, were just as good. I don't know whether prints from his negatives are accessible, but, if they are, I advise the photographer who is weary of mud flats, sunsets, evenings, and architecture to carefully study them. They will reveal to him a new world of photographic possibilities.

The friends and others who have inquired after the Salon epitaph may like to know that, with all the love and affection of an author for a favourite child of his own creation, I have taken the MS. out of the bureau where I keep my most cherished productions, have touched up the lines here and there, and have made an addition or deletion where it seemed desirable to do so. The epitaph may be needed sooner than is generally anticipated, for I hear that some of the most prominent Salonites, who have for long held aloof from Pall Mall, propose exhibiting at the R.P.S. next autumn. Seriously, I am told that some important secessions are likely to take place from the Salon. I shall be very sorry if this has the effect of fatally weakening the institution at the critical age of seven years; still as some consolation to the trustees in bankruptcy, if they would like a photographic copy of the epitaph in gum bichromate—why, it shall be done.

COSMOS.

#### CONCERNING THE ACTION OF NASCENT SILVER IN THE PROCESS OF DEVELOPMENT.

[Translated from the *Archiv für Wissenschaftliche Photographie*.]

CERTAIN photographic processes, such as the silver intensification of a negative, the development of the latent image upon a collodion plate, and the development of a gelatine plate after fixation, depend upon the deposition of metallic silver from the developer upon the nascent silver present in the film, be the latter due to the direct action of light upon the sensitive collodion or gelatine (Silberkeim theory), or to the action of the developer (subhaloid theory). The building up of the latent image upon a dry plate is similarly explained by the developer reducing the unaltered silver bromide of the emulsion and depositing the silver upon the nascent particles which are already present.

Eder resorts to electro-chemical considerations for the explanation of such processes and thinks, with Lermontoff, that galvanic elements are formed by the particles of silver, the solution of silver salt, and the developing solution, which by their action deposit silver. But, as such elements cannot be formed, excepting under conditions unfulfilled in the cases in question, namely, that the solution of silver salt and developer shall not be mixed, but shall flow side by side around the silver particles, we must find some other explanation. This may be found in the following manner:—

According to one of Ostwald's well-known propositions, supersaturation must precede deposition from a homogeneous solution; consequently, in the cases referred to, there must first be a supersaturated solution of silver. This is brought about in the following manner: Developers are reducing agents, that is, substances which strive to become charged with positive ions. The reducing action of potassium ferrous oxalate depends upon the endeavour of the double negative ions of ferrous oxalate,  $\text{Fe}(\text{C}_2\text{O}_4)_2^{--}$ , to take up a positive charge and change themselves to single negative ferric-oxalate ions,  $\text{Fe}(\text{C}_2\text{O}_4)_2^-$ . These positive charges are taken from the silver ions in the process of development, because the endeavour of the metallic silver to pass into the ion condition is much weaker than that of the ferrous-oxalate ions to take up a positive charge. The potential of an electrode, which cannot be attacked, for a solution of potassium ferrous oxalate, is about  $-0.28\text{V}^*$ , whilst that of silver for silver nitrate is  $-1.05\text{V}^\dagger$ . Now as the active reducing ions deprive the silver ions of their charge, a supersaturated solution of silver of very slight concentration is formed in the fluid, and, according to an acknowledged principle, this supersaturation finds relief at those parts of the system where nascent silver exists. Should more be present, the silver precipitates itself preferably on rough surfaces and the like.

In support of the theory, that in developing a dry plate silver bromide is reduced, although unexposed and almost insoluble, Eder‡ cites an experiment, according to which a plate immersed in developer is said to be reduced at those portions where a silver wire has been brought in contact with it. But, notwithstanding many attempts, I have been unable to repeat this experiment, which has generally been considered of fundamental importance in the theory of development and frequently quoted. At first I tried in the manner described by Eder. Gelatine plates were immersed in the developer (potassium ferrous oxalate or pyrogallol) and,

\* Bancroft, *Zeitschrift für Phys. Chemie*, 14, 193 (1894).

† Neumann, *Zeitschrift für Phys. Chemie*, 14, 229 (1894).

‡ Sitzungsb. d. K. Akad. d. Wissensch. Mathem. Nat. u. w. Klass. Vienna, 1880, vol. lxxxi., 692. *Handbuch*, vol. ii. 47; vol. iii. 93.



under avoidance of pressure, pieces of silver wire and foil, of purest quality from the refinery, were placed upon them and the action of the developer was allowed to continue up to thirty minutes. I also coated some plates with emulsion containing small pieces of silver wire and foil, which had been previously frosted with nitric acid. The plates were dried and subjected in a similar manner to the developer. In none of the many experiments which I made was there any perceptible reduction where the silver and the emulsion were in contact.

The negative results of these experiments surprised me much, and I was at first inclined to infer that only the slightest quantity of silver could be set free and reduced in the process of development, and that the bulk of silver forming the negative was predetermined by the action of light. In this case the nascent-silver theory would lead one to expect that a plate fixed immediately after exposure would show a distinct negative image, and the subhaloid theory, that a similar plate could be developed with an ordinary developer without any silver. But, as neither is the case, only one supposition remains, namely, that the bulk of the silver forming the negative is in fact produced by reduction from the unaffected silver bromide. Abney's\* experiments concerning the reduction of unexposed silver bromide by an alkaline solution of pyrogallol are decidedly in favour of this supposition, likewise the same author's experiment showing that the image formed upon a plate wanting in density may be intensified by coating the same with bromide emulsion before or after development, and then subjecting it to the developer.

But what was the cause of the failure of the experiments to which I have referred? I believe that the explanation must be sought for in the probability of the silver being deposited upon the surface of the small pieces of metal, and that it could not be traced without exact measurement of the latter before and after the experiment. The conditions are different upon development of a dry plate, as in Abney's experiments. In this case the silver is deposited upon the very fine particles of nascent silver present in the film, and it is apparent that the amount of silver in this case will produce a marked intensification, whereas it could not be detected upon the surface of thick wire, &c.

According to the exact measurements made by Eder,† reduction spreads but slightly, in a lateral direction, in the unexposed parts of the emulsion. The spreading of a line, upon a plate free from fog, after thirty minutes' development, was 0.008 to 0.01 mm.; in the presence of fog lateral spreading was more marked and amounted to 0.02 to 0.03 mm. The remarkable difference in the activity of the nascent silver at the margin of separation between exposed and unexposed silver bromide becomes less surprising when we consider that the silver would naturally be deposited most, in a given unit of time, upon the largest surface of silver, or, in other words, upon that portion where most nascent silver was present. Take, for example, the image of a white square upon a black ground. The deposition of silver upon the nascent particles would decidedly increase the extent of their surface. The deposit would form mostly within the square and with constant acceleration, whilst intensification would proceed but slowly in the adjacent portions devoid of nascent silver. Similar facts may be observed in the analogous process of intensification with a developer containing silver.

Eder‡ found, when a plate was coated with a very thick, opaque emulsion of gelatino-bromide of silver, that reduction of the silver bromide in the exposed portions went completely through the film. Considering the very slight lateral spread of deposit, I differ from Eder, and believe that the penetration of development is not due to the action of nascent silver. I think it far more probable that most of the action is due to chemically active rays, notwithstanding the opacity of the film.

KARL SCHAUUM,  
Chemical Institute, Marburg a/L.

## PRINTING WITH BICHLORIDE OF MERCURY AND CITRATE, OR TARTRATE OF IRON AND AMMONIUM.

[Translated from the *Photographische Correspondenz*.]

In a similar manner to certain iron and silver processes, a paper prepared with arrowroot may be brushed over with a solution of bichloride of mercury and citrate of iron and ammonium. This printing paper when dry differs but little in appearance from silver nitrate and ammonio-citrate of iron paper (such as Arndt's and Troost's sepia flashlight copying paper).

When paper thus prepared is exposed to light under a negative, the exposed portions assume a brownish hue, and form a pale brown picture

upon a greenish ground. Upon immersion in water the unexposed image dissolves and a pale brown picture remains.

These prints yield a vigorous blue-black image, if they are well washed and treated with a suitable alkaline developer, especially if they are dried at a temperature of 80° to 90° C.

At first I was of opinion that in this process the reduction of the ferric to the ferrous salt by exposure to light converted the bichloride to subchloride of mercury (calomel), and that treatment with sulphite of soda (either at once or after washing) would produce a black mercurial image. This supposition was favoured by the behaviour of the print, which gained in intensity when treated, after washing, with dilute ammonia. It was also supported by the fact, that the image changed but little in the process of washing, whilst the bichloride of mercury and ammonio-citrate of iron were completely removed. On the other hand, treatment with sodic sulphite, after washing, did not produce any appreciable intensification of the original image.

It would therefore seem probable that the process which takes place when this mixture is exposed to light is the formation of a ferrous mercurous salt insoluble in water, which turns to brown basic salts by treatment with ammonia. Experiments also proved that this image can be intensified by alkaline development, the tones thus obtained being of a blue-black character.

The few experiments I have been able to make show that the process is deserving of notice, and I propose to continue them and publish the results at an early date.

Very promising results were obtained with the following preparation:—

A.	
Water.....	200 grammes.
Ammonio-citrate of iron (green) .....	40 „
Citric acid .....	4 „

B.	
Water.....	200 grammes.
Gelatine.....	6 „

These should be mixed warm, by yellow light, with

C.	
Alcohol .....	100 c. c.
Bichloride of mercury .....	24 grammes.

The paper should be brushed over with the warm solution, equalised and dried. Print under a vigorous negative.

The prints should be well washed, and after treatment with a solution of ammonia (5 to 100) and rewashing, developed with a normal developer (hydramine, for instance). The image soon assumes a vigorous brown tone, which changes to blue black when dry.

PROFESSOR E. VALENTA.

## TRICOLOUR TRANSPARENCIES FOR PROJECTION AND THE STEREOSCOPE.\*

### II.—THE PREPARATION AND COMBINATION OF THE SEPARATE IMAGES.

MANY methods have been suggested of preparing transparencies in any desired colour, but they are all based on the use of bichromated gelatine. Thirty years ago Ducos du Hauron prepared such pictures with carbon papers coated with gelatine, coloured with Berlin blue, carmine, orpiment, &c. In this process, however, the choice of colour is limited, as any colour cannot be used, and, moreover, differently coloured films do not print with equal gradations, so that pictures are obtained which differ considerably from one another, and the colour rendering of the finished picture is thus prejudicially affected.

It is much more convenient to prepare the pictures in gelatine free from colour and to colour them afterwards. They are then all of the same character, and it is possible to obtain any depth of colour by the use of aniline dyes, and it is possible to obtain the colours more or less saturated. The colouration is effected by immersing the picture in an aqueous solution of the dye.

The colourless gelatine images are obtained by a process very similar to the well-known pigment or carbon process, only that uncoloured bichromated gelatine is used; Lumière prefers a process similar to the bi-gum process, whilst Dr. Selle has worked out a process new in principle which is based on the different behaviour of exposed bichromated gelatine towards solutions of dyes.

The last two methods are protected by patent, but can be dispensed with, as the first process, which is founded on the carbon process, is quite satisfactory for small pictures, about which at the present we are talking. This method will therefore be described in detail, whilst those of Lumière and Selle will be briefly described.

\* Philos. Mag. (5) 3, p. 46. 1877.

† Handbuch, vol. ii, p. 47; vol. iii, p. 99.

‡ Sitzungsber. d. Wiener Akad., vol. lxxxi. p. 692 (1880); Handbuch, vol. iii, p. 92.

\* Continued from page 410.



*A.—The Colourless Gelatine Images.*

As a support for the gelatine images only colourless absolutely transparent films must be used of a thickness of less than 0.1 mm. Gelatine, collodion, celluloid, and mica will give such films. For the method to be described the last two materials alone can be used.

Uncoloured bichromated gelatine films, such as were used by Vidal and later by Ives for the preparation of coloured pictures, have the disadvantage that the prints show a high relief, and therefore scarcely reproduce the details in the shadows.

This defect, however, can be easily got over by adding to the gelatine film a powder which stops the too deep penetration of the light during printing, and which can be removed again from the finished gelatine image. For this purpose silver bromide is the best thing, as it can be easily removed from the film by the aid of hyposulphite of soda.

The pigment process may be carried out in two different ways; either the thin image support, such as the celluloid or mica, may be coated with bichromated gelatine, and then printed from the back, that is, through the transparent support, and developed with warm water, or the film may be spread on paper and exposed under the negative, and the picture then developed upon the support in the usual way.

The first method is simpler and easier to carry out, and is specially useful when celluloid films are used; the second must be used when a somewhat thicker support, such as a sheet of glass, is considered desirable and absolute sharpness of the prints is essential.

*1st Method.—Direct Printing on Celluloid Films.*

Three-coloured pictures on celluloid films are obviously useful for the stereoscope, but they can hardly be used as lantern slides, as at a somewhat high temperature they suffer badly from cockling, &c.

The carrying out of this method has been rendered considerably easier by the rollable films, since, when sensitised in a solution of bichromate, they answer most satisfactorily for this purpose.

Pieces the size of the negatives are cut out of a spool of film always in the same direction, in order to avoid the expansion of the band of celluloid, which differs slightly in the length and the breadth. Celluloid is, according to its size, by no means a stable material; it expands considerably in water, and again contracts on drying, especially in hot weather, therefore it is only when the method of preparation is absolutely the same that the three prints can be obtained of the same size. The choice of the pieces for sensitising can be done, of course, as the silver bromide actually plays the part of a pigment.

The sensitising is effected in a solution of ammonium bichromate 1:80. The films should be completely immersed in the solution, and allowed to remain for about half an hour, and then hung up to dry.

Printing is done, as already mentioned, through the celluloid, so that this, and not the film of silver bromide, is placed next the negative. Printing should be done in the shade, and about five minutes' exposure is required.

After printing the pictures are developed with warm water, and this must be done slowly, and at as low a temperature as possible, in order to avoid any distortion through the softening of the celluloid. After development the film should be placed in a solution of hypo, to which a little potassium ferricyanide should be added, in order to remove any metallic silver which might be formed, and which would give a brown colour to the gelatine. The white silver bromide dissolves in the hypo, and an absolutely colourless gelatine picture is the result. This should now be washed with water, and the film placed, without drying, in the solution of dye.

*2nd Method.—Transfer Process for Pictures on Glass and Mica.*

This method is suitable, as already mentioned, specially for three-coloured pictures for projection. Sheets of mica, in the usual sizes of lantern pictures, of perfect quality, may be obtained commercially,\* so nothing stands in the way of its use.

It is not advisable, however, to prepare all the three images on this material, as the leaves break very easily, and are therefore difficult to handle, and their thickness, which is also increased by the gelatine, is rather troublesome. It is preferable, therefore, to make two pictures on glass, and the third on mica, and then to so combine the three that the mica is sandwiched between the two glasses. This procedure requires, however, that one of the two glass pictures should be reversed, so that this, when reversed, will have its film in contact with the other. This reversal of the image is most simply obtained by taking a reversed negative, by placing a sensitive plate in the dark slide with its glass towards the lens. This process is obviously easiest to do with the negative for the yellow print, whilst, in exposing for the blue and red, the sensitive plate should be placed in the correct position in the slide, and covered with the colour filter, whilst the ordinary plate without the filter is reversed in the slide. If the thickness of this plate is equal to each of the two filter plates, three negatives, which will absolutely correspond, will be obtained.

As previously mentioned, the negatives are printed on bichromated gelatino-bromide of silver paper, and then developed on the glass or mica plate.

\* From the mica warehouse of Max Raphael, Breslau.

For this a paper coated with ordinary silver-bromide emulsion should be used, and for a sheet 48×72 cm. there should be about 25 grains of gelatine and 20 grains of silver bromide.

The proportion between gelatine and bromide affects the character of the prints. For plucky negatives it is advisable to increase the silver bromide in order to prevent the formation of a high relief, whilst for soft negatives a paper poor in bromide should be chosen. The above quantities correspond approximately to the emulsion generally used for dry plates.

Any existing formula for such an emulsion can therefore be used; it should be washed in the usual way, then melted, and then coated on the same kind of paper as is used in the carbon process.

The preparation of the emulsion, as well as the coating and drying of the paper, can be done in daylight, as the silver bromide has only to act as a pigment and the grey discolouration caused by light does not matter.

The sensitising, printing, and development of the pictures is done exactly as in the carbon process, only, in order to obtain pictures of equal size, the following must be taken care of: The pieces of paper must be cut out of the sheet in the same direction, as the expansion caused by damp is different in the length and breadth of the sheet. Further, the prints must not, as usual, be soaked in cold water before squeegeeing on to the glass plate, but must be painted over on the film side with a broad brush with water, and then quickly squeegeed down on to the sheet of glass or mica.

In this way it is possible to obtain prints which will register every where, assuming that only small pictures are to be made.

After development in warm water the silver bromide is removed, as described above; the picture is then washed, and it can then be coloured.

**DEVELOPMENT WITHOUT LIGHT.**

THE increasing use of such plates as Cadett's spectrum and Lumière's panchromatic has lately directed attention to the quality of dark-room light which is safe to use with plates which are sensitive to almost all parts of the spectrum. Notwithstanding Messrs. Cadett's advice that their particular safe light must be used with their spectrum plates, I have for the last two seasons developed a large number of these plates without exposing them to light of any kind, timing the development by a modification of my well-known method of taking the time of the appearance of the image as a basis.

As I have lately received inquiries as to details of this method, consequent on my demonstration at the Convention, it may be convenient to give it for the benefit of all interested, especially as it does not of necessity require the purchase of any special apparatus.

*Outline of Method.*—A number of slips of the same brand of plate are provided beforehand, impressed with a standard amount of light. These slips are used for testing the developer before it is poured on the plate, and the time of appearance of the image on the slip is multiplied by a fixed number to give the time for the development of the negative. The negative is then developed in darkness for this time.

*Control of Results.*—It is a general idea that timing development is only suitable where exposures are absolutely correct and subjects do not vary much. This is not the case both in theory and practice. If a series of widely varying exposures on the same subject be timed in the way described, the negatives will differ in apparent density, the longest exposures being dense and taking long to print, and those nearest under-exposure thin and quick printing. Within certain limits, however (perhaps 1 to 16 with an average plate), all the negatives will yield prints of identical gradation. As regards variation of subject, I took out spectrum plates to Switzerland this year, exposing with the new Cadett light-filter on landscape, others without the filter, and also using the same plates for snap-shots, the variety of subject being great. All were developed without seeing results until fixed (using the same multiplying factor for all) with most satisfactory results.

If, at any time, it is desired to get greater contrast in the print, a longer multiplying factor will give it, or, if less contrast is required, a shorter factor can be used.

I have also lately found (somewhat contrary to my anticipations) that timing by the appearance of the image makes correct allowance for the density-giving capacity of various plates. For instance, I have taken six varieties of plates, some having a reputation for hardness, and some for giving soft negatives, and exposed them in proportion to their sensitiveness (previously found by the H. & D. method), and, on developing each for five times the appearance of the high lights with the same developer, the resulting negatives were practically identical. But let me proceed to describe the method which is specially suitable to colour sensitive plates, because it obviates any necessity of using a dark-room light at all.

*Details of Method.*—Mix the developer; I have used pyro soda, pyro 2 grains, soda 8 grains, bromide none. Turn down the gas (I am presuming the use of a room in darkness), take one of the trial slips out of its box, and, holding in a cycle clip, dip into developer in the measure, not moving about much. Commence counting seconds accurately as you dip the slip. At twenty seconds turn up the gas for an instant;



if the image has not appeared, turn down again and repeat a few seconds later. In this way the time of appearance of the slip is noted, or, if more convenient, it may be done in usual dark-room light. Suppose the image appeared in thirty seconds. With the developer named I got the gradation or contrast I like by developing for ten times. The negative will therefore require to be developed for ten times thirty, or for five minutes. All light is covered up or turned down, the plate put in the dish, developer poured on, commencing to count seconds at the same time, the dish covered up with a larger one inverted and the plate rocked. By the time three seconds is counted the gas can be turned up and the ekronometer set at half a minute past the starting point, or the watch looked at to note the time when the five minutes commenced. An occasional tilt can be given to the dish and at the end of the five minutes light turned down and the plate rinsed and put in a fixing bath. A little fogging of the trial slip is no harm if it does not come much before the image appears.

I have found great ease and comfort in using this plan of development with Lumière plates for Ives's kromskop negatives, being always sure of securing the same steepness of gradation, a most important point in colour work. For this work a shorter factor than for landscape work is desirable, as soft negatives with not too much contrast are wanted.

*The Trial Slips.*—A plate of the same brand as that to be used is placed behind a grating or screen in a printing frame and exposed to a standard candle at one meter for four times the inertia of the plate, as tested by the H. & D. method.

The plate can be of the largest convenient size, to be afterwards cut up into strips about  $1 \times \frac{1}{2}$  in. The screen is made by cutting lantern strips lengthways and pasting them diagonally on a glass plate, the opaque and clear divisions being equal.

As the inertia of a plate is found by dividing 34 by its H. & D. No.,  

$$\frac{34}{\text{H. \& D. No.}}$$
the number of seconds to expose the plate is—

It would be convenient that the maker who has already tested the speed of the plate should expose the trial plates to the same standard light and supply the strips in small boxes ready for use. I have found one plate last for a season's work. I am in hopes that these strips will be obtainable before long. The trial slip should be of the same brand as the plate developed, but it need not be the same batch of emulsion. I think this plan is a step in the direction of standardising photographic methods, for, so long as the same temperature is used to ascertain the H. & D. No. (which decides the exposure of the trial slip), a user of widely different brands of plates can develop each to exactly the same stage of gradation with the aid of its trial slip, and, as he has already (with the aid of the H. & D. No.) been able to give a relatively correct exposure, he can secure identical negatives on brands which have a reputation for widely different results. I have proved this by trial.

ALFRED WATKINS.

#### PRINTING FROM UNFIXED NEGATIVES.

HERR GOLDSCHMIDT, of Charlottenburg, in describing such a process, points out that in photographic practice it is usual to obtain a strong copy from thin, weak negatives by copying under silk paper, or, when the negative is very thin, under yellow glass or yellow-waxed taffetas or the like. Upon this principle the new process is based. The photograph is taken and the view is developed by means of a strong developer, but only to such an extent that, when examined, all the details are visible. The plate is then very rapidly washed, and, whilst still wet and in its unfixed condition, a sheet of bromide of silver paper, or a bromide of silver post card or other very sensitive copying paper, is placed and squeezed upon it by means of a rubber squeegee, and then, as in the usual copying process, in producing a so-called contact copy, exposed to the light of a lamp for a few seconds. The paper is then lifted off and developed in a suitable developer, and can be fixed and washed afterwards.

By omitting the fixing of the photographic plate, the yellow bromide of silver is preserved in the film and acts as the above-mentioned yellow veil in copying the thin negative, and by this means a clear, strong picture is obtained from the latter, notwithstanding its thinness, which renders it completely unfit for use in the ordinary way.

By proceeding in the above-described manner all the time is saved, as will be easily understood, which was formerly necessary for the washing of the negative, fixing it, and for thoroughly washing it again.

The application of the bromide of silver paper upon the non-fixed negative whilst wet is done not only in order to save time, but also to obtain, what in the dark can be judged of with difficulty, an intimate contact between the film and the bromide of silver paper. To attain the latter still more rapidly and completely, the bromide paper, prior to its application, may also be thoroughly moistened in water under the tap or by immersing it in a bowl of water, so that, on application of the paper to the plate, there is only water between the two layers, which is expelled by pressing the two together by means of a rubber squeegee.

In this way air bubbles are avoided, and the formation of spots resulting from the refraction of the light in copying is prevented.

The process above described allows of the production within less than

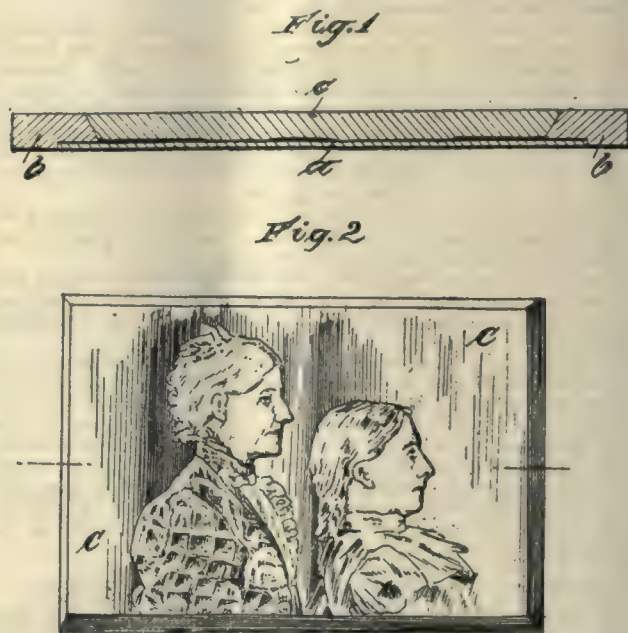
four minutes, as numerous tests have proved, or even within less than three minutes after taking the photograph, photographic positive pictures either on paper or on other material, and of producing, moreover, within a comparatively shorter time from the existing negative any desired number of copies.

In the last case it was found from time to time that a certain amount of developer, owing to the rapid washing of the plate, was still present though in a dilute condition in the negative film, and, under the action of the light necessary for copying, it gradually veiled the negative, so that, when a large number of copies were to be made, the last were not of so good a quality as those first made. This drawback is avoided by immersing the plate just developed, after having been rinsed for a few seconds, for some seconds in an aqueous solution of bromide of potassium, it being then again rinsed rapidly before printing. The solution of bromide of potassium remaining owing to the very rapid rinsing in the layer acts in the subsequent printing process not only not prejudicially, but contributes in bromide of silver paper to the production of a picture rich in contrasts and showing considerable density, whereby the decrease of power or loss of tone which always takes place with bromide paper during drying is compensated.

#### PLASTER CASTS FROM NEGATIVES AND POSITIVES.

HERR SCHUTTE, of Charlottenburg, proposes to accomplish the process here mentioned in the following manner:—

After having taken a particularly clear photograph of the object to be reproduced, which is best done on a plate coated with a thick layer of emulsion, the parts decomposed by the light are well washed after developing and fixing. Over the photographic plate, *a*, which has been treated in this manner, the frame, *b*, made of wood or other suitable material, is placed, the frame being so made that it covers the edge of the plate, *a*, slightly.



Into this frame a layer, *c*, of liquid plaster of Paris is then poured. As soon as the plaster has hardened a little, the frame, *b*, is removed, and the slab, *c*, of plaster of Paris is lifted off the photographic plate, *a*. The under side of the plaster slab, *c*, now shows the exact "relievo-like" reproduction of the photographic negative.

If it is desired to use this plaster cast directly, as medals, ornaments, or for any other purpose desired, it will be well to suitably colour the plastic side. The colouring should be done by water colours, and by means of a large and very soft brush. The colouring matter will collect principally in the sunk places, and thus an effective picture will be produced. By galvanoplastic means printing blocks, ornaments, &c, may be produced from the plaster slab, *c*, in the usual manner.

An analogous process has been protected by Herr Pietzner, of Vienna; here is his description of it:—

Equal parts of agar-agar (an alga—vegetable gelatine) and pure gelatine are dissolved in water just sufficient to dissolve the two kinds of glue into a viscid mass. This mass or substance is then mixed with a solution of three per cent. to eight per cent. chromate of potassium, according to the light and shade effects of the original (picture or body) which it is desired to photograph for sensitising purposes, and is then applied as thick as possible to a smooth glass plate, and dried with the exclusion of



light. The plates thus prepared are essentially suited for the production of reliefs, as they enable high reliefs of great resistance to be obtained, which are developed first in tepid water, then in warm water, and finally in water containing acetic acid.

From a negative photograph, taken in the ordinary manner from any desired original, is produced a positive high relief, by causing the gelatine to swell through the action of water thereon. From this positive a plaster of Paris cast is taken, which naturally must be negative, and to which in the following I will refer as the gypsum matrice.

Again, from the original there is produced a diapositive, and by means of this a high relief, which latter is therefore a negative, from which a plaster of Paris cast is made, this latter being a positive, and hereinafter called the gypsum die-plate.

Thereupon a thin layer of plastic clay, or other suitable material, is prepared, and pressed into the gypsum matrice so as to obtain a positive cast. The gypsum die-plate is now coated with shellac by preference, or other similar substance, and is afterwards corrected or touched up in accordance with the requirements of the art of plastic representation, without, however, paying too minute attention to a perfectly accurate likeness in every small detail of the original. This touching up is done by raising the portions that are too low or too deep by a covering with wax, or similar tough but plastic substance, while scraping the parts that protrude too much. The clay impression previously made by the aid of the gypsum matrice is then properly applied to the corrected gypsum die-plate, and gently pressed. This may also be effected by pressing the corrected gypsum die-plate on to the back of the clay impression contained in the matrice, so as to cause it to unite therewith or adhere thereto, and afterwards removing from the latter the clay together with the die-plate.

The clay impression thus transformed on to the gypsum die-plate is now no longer able to sink at those parts which in the first instance were too deep, because they are now resting upon the corrected die-plate. The combined clay impression and die-plate is then finally finished and touched up in the usual manner.

The chief characteristic feature of this improved process consists in that a gypsum die-plate, the main features of which resemble the original, and which die-plate is produced by any photographic or photo-mechanical means, and used in combination with a second positive impression of clay, or the like, also taken from the same original, for the purpose of enabling minute details of the original to be reproduced, and by the combination of the two parts to obtain a true and faultless plastic representation of the said original.

A second method of carrying out the afore-mentioned process is as follows:—

From a negative relief, produced by the aid of a diapositive, or by a gypsum matrice prepared from a positive relief obtained from a negative impression, there is produced a positive impression in a thin layer, the material used being plastilin, a plastic commercial article much used by sculptors, and resembling wax or putty; or, if desired, wax may be used when moulding direct from the original relief, while clay may be advantageously used for moulding from the gypsum matrice.

The impression, whether produced in plastilin, or wax, or in clay, by the one or the other means, is then, by means of a moulding board, worked and pressed home as usual, until the impression, from an artistic point of view, is fully equal to the original, and those parts which at first were too low are raised into their proper position. If found necessary, the cast may be retouched, as in the first process before described, so as to produce an artistically finished plastic model, from which, if desired, a mould (matrice) may be taken to serve in casting or otherwise forming the subjects or articles, hereinbefore referred to, required for the various branches of the industries.

If the articles are made of ceramic ware, they may, if desired, be produced in a single or a number of colours burnt in during the firing.

#### DR. EDER ON ADUROL.

Messrs. A. & M. ZIMMERMANN have handed us the following report on Adurol-Schering by Dr. Eder:

On May 27 the *Chemische Fabrik auf Actien* (vorm. E. Schering) Berlin, requested the Board of the Royal Imperial Graphic College and Institute to examine and report upon the correctness of the following claims for their developing product, Adurol-Schering. The following advantages were claimed for adurol over hydroquinone: firstly, as regards its power of development it stands between hydroquinone and the so-called rapid developers, metol, para-amidophenol, &c.; secondly, that adurol does not produce such a hard result as hydroquinone, and that with fully exposed plates it has an advantage over the rapid developers, in that development is much more easily controlled; thirdly, it is also claimed that adurol keeps indefinitely, and it has the further advantage over the rapid developers of superior solubility (due to its lightness), neither is there any need for caustic alkalies in stock solutions; fourthly, the ready-mixed developer does not turn brown through oxidation by contact with air, therefore solution can be used over and over again without fear of staining.

Conclusions: Schering's adurol is a bromide preparation of hydro-

quinone, i.e., "monobrom-hydroquinone." It occurs as a white crystalline powder, soluble in water, and even more so in alcohol and ether. As regards its properties as a developer for gelatine dry plates, trials were undertaken with this developer and with equivalent quantities of hydroquinone in connexion with the sensitometer in this laboratory, and also by practical proof in a studio.

The formulae used were those given by the manufacturers:—

#### I.—CONCENTRATED SOLUTION.

Pot. carb. ....	150 parts.
Soda sulphite cryst. ....	75 "
Water .....	200 "
Adurol .....	15 "

For use take 1 part of above and 10–15 parts of water.

#### II.—SEPARATE SOLUTIONS.

A. Soda sulphite cryst. ....	50 parts.
Water .....	500 "
Adurol .....	10 "
B. Pot. carb. ....	60 "
Water .....	500 "

For use A and B are mixed in equal parts.

The ordinary dry plates of commerce were used of the same make and sensitiveness (14–15 per cent. Scheiner and 23–24 per cent. Warnke). On testing two developers, one containing adurol and the other hydroquinone, in equivalent parts, the following results were arrived at:—

Under the same conditions of temperature, with adurol the pictures appeared quicker, and development was complete sooner than when using hydroquinone.

As regards speed, adurol resembles the rapid work of the para-amidophenol class. The high lights and shadows quickly appear, and the half-tones are built up little by little, while the finished picture is somewhat softer in graduation than that produced by hydroquinone.

A low temperature of the solutions had less effect on the working of adurol than on hydroquinone.

On the addition of potassium bromide to the solution so that it could be amply proved as claimed that potassium bromide delayed the appearance of the picture: In this direction it had a marked action, but the effect on the finished negative was insignificant as compared with that in the case of hydroquinone, pyro, or oxalate.

As regards the claim of point three we proved well founded that adurol-Schering, by virtue of its solubility, not only renders possible a concentrated solution which remains colourless for a long time, but also it easily succeeds in doing the work in the presence of sulphite of soda and carbonic alkalies without the aid of corrosive (caustic) alkalies.

It has only a slight tint, is of good-keeping qualities, and, when diluted with from ten to fifteen parts of water, gives a developer ready for immediate use, *vide* formulae (conc. sol.).

With hydroquinone it is not possible to make a similarly concentrated solution, it being necessary to dissolve by heat, and, when the solution cools, part of the developer was thrown out.

The ready-mixed adurol solution was used once and then kept in half-open bottles for fourteen days, becoming only slightly tinged, but remaining strong enough to produce a normal picture on an exposed dry plate.

In the practical trial in the studio it was evident that adurol was as suitable for portrait and instantaneous pictures as for landscapes.

The comparison with hydroquinone and metol gave the following results:—

Under the same exposure the picture appears with adurol in five to ten seconds, with hydroquinone in forty seconds, with metol in two to three seconds.

The development was finished with adurol in four to five minutes, with hydroquinone in six to seven minutes, with metol in about four minutes. The adurol deposit is of a beautiful grey-black colour, the density and the rendering of the fine details are very good.

These results worked out at this laboratory coincide exactly with the claims made above.

The sensitometer tests proved that adurol was twice as energetic as hydroquinone, and that hydroquinone (fresh) gave more developing fog than equivalent parts of adurol.

It has therefore been sufficiently proved that that product of Schering, commercially known as adurol-Schering, produces a developing solution with all the good properties of hydroquinone and many advantages, the picture appearing quicker without the presence of caustic alkalies, as were hitherto necessary. Further, it also works rather more softly than hydroquinone, and also that adurol is permanent as concentrated solution, and that this developer can be used over and over again and does not deteriorate.

In conclusion, it must be stated that adurol-Schering bears relation in its properties to the analogous chlorine derivative of hydroquinone known as adurol-Hauff, which emanates from Hauff & Co., in Fenerbach, and which, as commercially issued, is very similar, and gives practically the same results.

The Director of the Royal Imperial Graphic College and Institute.

Vienna, July 1, 1899.

(Signed) DR. EDER.



## REDUCTION AND INTENSIFICATION.

On the 17th inst. a Beginners' Evening was held at the North Middlesex Photographic Society, when Mr. J. McIntosh dealt with reduction and intensification. He said that most reducers, such as Howard Farmer's and Belitzki's, altered the ratios of gradation, as they acted more powerfully upon the shadow detail than upon the high lights. As an illustration, he suggested that, if a slice of sponge, the interstices of which were filled with crystalline matter such as candied sugar, were cemented to a sheet of glass, it would be an analogue to the gelatine film with the silver image imbedded in it of an ordinary negative. To bring the analogy closer, it was suggested that the crystalline matter in the sponge should be unequal in thickness, that a thin layer near the surface of the sponge would represent the shadow detail, that the half-tones would be represented by a layer of greater thickness, and that in the portion representing the high lights the thickness of crystals in the slice of sponge would reach down to the glass. He suggested that, if this imitation negative were immersed in warm water, the crystalline sugar all over the surface of the film would be rapidly dissolved out. Shadow, half-tone, and high light would be equally affected, but the relative action would be very different. The portion representing the shadow detail would be entirely removed, the half-tone would be reduced by, perhaps, only half its thickness, and of the high light possibly only one-eighth would be dissolved. The interstices of the sponge would be so filled up with syrupy matter that the water which acted as a solvent would be unable to act upon the crystals near the glass. In the actual negative the action was very similar. On the surface of the film the silver was dissolved by the chemical acting as the reducer, and passed freely into the bath, but in the half-tone and high lights the solution saturated with silver was held in the meshes of the gelatine, and protected from action the silver near the glass.

Recently a new agent had been introduced. This agent, ammonium persulphate, acted in a very different way. According to some authorities it dissolved away the high light to a greater extent than it did the shadow detail; according to others, and among these was Mr. John Sterry, the action was proportionate throughout; and the lecturer believed that this latter opinion was the correct one. The reason for this peculiar action did not appear to have been definitely decided. MM. Lumière and Seyewitz were of opinion that it acted most energetically in the presence of an excess of silver. Professor Namias demurred to this, and M. A. Hélain had advanced the theory that the gelatine in a negative parted with its hydrogen in proportion to the amount of silver bromide which was reduced to metallic silver during development, and that the ammonium persulphate acted upon the silver where the gelatine was oxidised, and upon the gelatine where it was in its normal state.

This theory might not prove to be absolutely correct, but it appeared to be a reasonable suggestion, and, if confirmed, supported Mr. Sterry's contention that the action was proportional.

In practice a two per cent. solution of the salt was a convenient strength for most work, and might conveniently be increased to five per cent. where the reduction required was great, and it had been suggested that a trace of sulphuric acid would assist the action. In working with strong solutions, particularly in warm weather, it was a useful precaution to saturate the solution with alum to prevent the solvent action of the chemical upon the gelatine.

When sufficient reduction had taken place, a whitish deposit would be found upon the portions most strongly affected. This compound of silver and sulphur would probably darken in light if not removed. To effect this, and to stop farther action of the ammonium persulphate, it was desirable to treat the negative with a five per cent. solution of sodium sulphite, or with the ordinary fixing bath (the lecturer preferred the latter).

In speaking of intensification, he said he had on previous occasions dealt with various intensifiers, and on that occasion would bring to the notice of the members of the Society the claims of Edwards's intensifier. This was a mercury compound, but, unlike most others, was a single-solution intensifier, and, in consequence, was particularly suited for local intensification in pictorial work, as the increase of density was seen as the action proceeded. The formula was:—

A. Mercuric chloride .....	60 grains.
Water .....	8 ounces.
B. Potassium iodide .....	180 grains.
Water .....	2 ounces.
C. Sodium hyposulphite .....	120 grains.
Water .....	2 ounces.

A was added to B and well shaken, and then C was added.

The solutions should be allowed to ripen for twenty-four hours before use. The results were not absolutely permanent, but, if fading took place, the negative could be restored by bathing in a five per cent. solution of Schlippe's salts. For general intensification over the surface of the negative, the plate was immersed in the solution, and allowed to remain till the required density was obtained, after which it should be thoroughly washed.

When slight increase of density only was required, the process was best suited to negatives which erred on the side of brilliancy, since it was

obvious that the action was from the surface downward, and the shadow detail would be fully intensified, while the half-tone and high lights would be only partially affected. When a flat negative had to be dealt with, the lecturer recommended the use of Monkhoven's intensifier as conferring greater brilliancy.

When local intensification was required he recommended that the plate should be first soaked in water, and then immersed in the solution till it assumed a brown tint and rinsed, after which the solution should be applied by a tuft of cotton-wool to those parts which required greater density. In the hands of a person who knew exactly what was required for pictorial purposes the process was capable of producing considerable improvement in the negative without interfering with the photographic detail or introducing inharmonious results.

## A PLEA FOR NON-PERMANENT PRINTS.

We take great pains to make our photographic prints as permanent as possible; if we thought more deeply over matters, we would not. That is, from the more important psychological point of view, for look for a moment at what permanent prints mean. In a world of change, and in which change means essentially vigour and life, we would have permanency in this photographic direction. But, as more to the special point, let an instance or two be taken. A woman has her photograph taken in a dress fashionably out, with her hair done up in the fashion in vogue. How long do the all-important accessories remain fashionable? And what is the photograph worth otherwise? Does not everything look absurdly antiquated in five years time? Does not the photographee tear up or burn any of the prints she may have in hand? And would she not give a good deal to be able to recall the ones distributed amongst her friends? What we evidently want here is not a permanent print, but one that fades with the fashion—one that, taken when bishop sleeves were the correct thing, will be but a blank when bishop sleeves have given way to something else. The same applies in a degree to a man, although not quite so markedly perhaps in the particular direction of dress, owing to the less range of change in it. But shape of collar, cut of whisker, style of trouser in his case are changeable enough to make a picture ten years old look very much older, and become correspondingly disagreeable to look at. Or, ignoring dress, if we can rise to such a height, who at heart likes, after he has passed forty, to think that he is getting older? By poetic right an old man should be satisfied with quiet autumn thoughts in the decline of life. But is he? Not he, nine times out of ten, but begrudges instead lusty manhood gone by. We feel, of course, with a diffused kind of consciousness, that we are getting older, but certainly do not want to be reminded of it by the abrupt knock-down blow of a photograph. The changes of life, again, short of old age, are so many and varied that what we regard as fixtures to-day are soon done away with, and gone to-morrow. What does the husband do with the photograph of his first wife after he shall have married his second, and, *vice versa* the widow with that of her first choice when she shall have chosen the second time? It is hardly the thing to burn them, and, turned with their faces to the wall, they would look altogether too obtrusive. They are gently put aside, probably in some odd quiet corner, but have a knack of turning right side up at a future moment to stir up emotion better let be. What a happy consummation had they but faded! How satisfactory to have escaped at the expense of the photographer! But the husband does not marry again, the widow remains a widow, and both probably do a good deal of sorrowful brooding over the past. Kindly nature does her best to dim remembrance and heal the wounds, all undoubtedly and admittedly for the best if the work of the world is to be carried on. Yet we do our best to counteract the beneficent order of things by keeping photographs in the most permanent materials, to be ever reminding ourselves of faces and joys long gone by and beyond recall. We cannot bring ourselves far enough out of the reach of sentiment and into that of reason to help by destroying the reminders. It is too much to expect from human nature; but how well would the circumstances of the case be met were photographs to gradually fade away at an equal pace with the mental picture and remembrance!

Leaving this side, where death and sorrow have had a hand in the printing and toning of feeling, the same desirability of fading remembrance is indicated by common sense as the better thing in many other directions. It has for instance been a feature of some magazines of late to give a kind of graduated ladder, as it were, of the growth of persons distinguished in arts, letters, or by high birth and social position, in a series of photographs of them from childhood up to the present time. An outsider may regard them as interesting after a fashion, but what must the one depicted, to whom after all the photographs must be the prime consideration, think of them? Personally any way—although there appears little likelihood of it at present—I should not care to pay such a penalty for being a well-known character. The posing, background, dress, accessories generally, of twenty or thirty years back, are far better buried, with all that made them appropriate enough at the time, but which are now sadly out of date. Pleasant pictures of



the past recorded on the brain are all very well, for they have become unconsciously modified and toned down by the all-round gradual changes in the medium they are printed in and on. A hard-and-fast photographic presentment, faithful in every detail, is a very different thing, and proof of it is clearly indicated by the jar experienced when such a one is unexpectedly presented to us. We would be happier without them; but, as we must needs be photographed, let it be in some of the less permanent processes.

The application of the principle is not confined to figures and portraits either, but will apply all round. The vividness of feeling that is correlated with the actuality of a photographic picture, other than a portrait, making it acceptable and pleasing when first seen is very short-lived. The sharpness of impression dies naturally away, the sharpness of detail of the photographic picture does not, and the two not being of a piece is why the leaves of albums are turned more quickly and carelessly over each time we look them over. There is, indeed, a luxury in the mind picture after the years have put in their effect upon it that is much detracted from by a photographic representation to compare it with. Take the pictures, for example, that most men carry in their minds of the distant scenes of their boyhood and youth, the house in the country, the square of the nearest small town, the wharf and they fished from, or what not. Photographs of these in thirty years' time, in clearing the haze that had gathered round them, and presenting them in their hard-and-fast, small, commonplace reality, do much to spoil the pleasure of their remembrance. They are worse than an actual visit to the spot, proverbially a pleasure-destroying proceeding, for the actual objects will have aged concurrently with their admirer and lover, and thereby gained something of mellowness, whereas a permanent print never ages. Then why have photographs at all? Because, on the other hand, there is a brisk, active present, full of detail which the photograph fits very well in with and is most admirably adapted for. Let us, if wise, confine our photographs to this, and, instead of aiming at permanence likely to become undesirable, try to gain command of a method of making a picture that will remain one as long only as we want it. Permanence in some directions is, doubtless, desirable, such as in the way of historic record for the benefit of those coming after, but, as an aid to individual human feeling and emotion, it is out of place.

This view will probably at a first glance be regarded as rank heresy by many, but it is due more to custom of thought than anything else. In proof of which let any photographer, who takes the trouble to think, look over his old prints, compare them as closely as he can with what he thought and felt at the time of taking and making them, and then with what he thinks and feels respecting the same places and people now. He will probably come to the conclusion that there is more in the contention for fleeting pictures than he thought when first presented to him.

A MINOR PHILOSOPHER.

## ON THE ACTION OF LIGHT ON THE SALTS OF COBALT.\*

### PART V. EXPERIMENTS WITH COBALTIC MALATE.

Moist cobaltic hydrate is sparingly soluble in an aqueous solution of malic acid on the application of heat. The solution of the malate thus produced is of a pale pink colour, and paper sensitised therewith is little, if at all, hygroscopic on drying. In sensitiveness to light, however, this salt is much inferior to the oxalate. Unsized paper, prepared by coating with a weak solution of the malate, failed to give any image on exposure to diffused light for over thirty-six hours. The addition of ammonium malate to the sensitiser occasioned no change in the character of the results.

The exposed strips were developed in a ferrocyanide bath, but this too failed to produce an image. On repeating the experiments, using instead of the ferrocyanide bath one of potassium ferricyanide, no change was visible so long as the bath remained neutral; but, on the addition of a few drops of acetic acid, a very faint bluish image appeared, noticeable only on those portions of the paper where the action of the light had been most intense. On the other hand, a ferricyanide bath, made feebly alkaline with ammonia, gave not the slightest image.

By using a more concentrated malate solution as a sensitiser it was found possible to obtain an image by development in a neutral ferricyanide bath, and this even when the exposure was considerably reduced. In one case a faint, but distinct, purple outline of the features of the picture was produced by such a bath after an exposure of only three hours in dull diffused light.

An attempt to develop, by means of mixed solutions of lead and mercurous nitrates, the latent picture produced by a ten-hours' exposure in diffused light was unsuccessful, no change being apparent.

The spectroscopic experiments made with this salt afforded results which at first sight are not altogether readily reconciled. The state of concentration of the sensitising solution would seem to have some influence on the character of these results, though it is perhaps doubtful whether the variations noted can be attributed entirely to that source. Seeing that, in one case at least, a secondary action manifested itself, and the image at first formed was gradually destroyed, the hypothesis

that a similar cross action may be assumed in the remaining cases, as a means of partially accounting for facts for which no other explanation offers itself, seems reasonable and, indeed, necessary.

The two prints first to be mentioned were made on paper sensitised with a moderately concentrated solution of the malate. In the other instances the solution employed for sensitising was much stronger, each fluid ounce containing upwards of seventy grains of the salt. The first print received an exposure of thirty-five hours to the rays of the spectrum. No change was visible until the paper was immersed in the usual ferricyanide bath, when a very weak reddish-brown image appeared. So far as could be judged, the maximum action seemed to be due to the violet rays. Considerable action appeared also to have been produced by the yellow rays, but the print as a whole was much too feeble to permit of an estimate being made of the relative intensities of the light at different parts of the spectrum. The next print was exposed for 100 hours. A greenish image was formed directly by "printing out," but the impression was exceedingly faint, and considerably obscured by superimposed yellow patches, representing an intermediate stage in a bleaching process, which was noticeable in the high lights. Decided proof of action in the green and the indigo rays was afforded by the print, and less decisive but sufficient evidence of action in the violet and the blue. On transferring it to the ferricyanide bath a plum-coloured image of quite a different

COBALTIC MALATE.

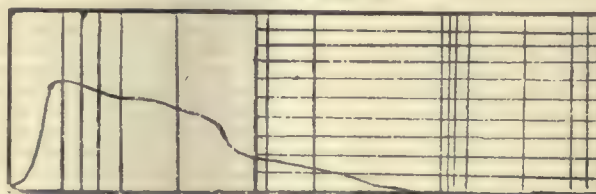


Fig. 11.

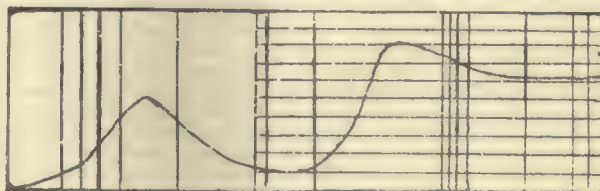


Fig. 12.

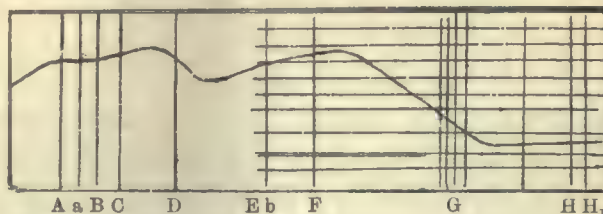


Fig. 13.

character was produced, represented in fig. 11. The position of the maximum deposit was now removed to the red rays, the green exercised only a weak influence, and the rays of greater refrangibility were apparently inoperative. In the third experiment the exposure was of twelve hours' duration. A greenish-yellow image was obtained readily by "printing out," in which the range of intensities was fairly well marked. Fig. 12 represents this image. It will be seen that the blue rays exercise the strongest influence and the red the least. There is also a deep depression in the region of the green rays, between which point and the less refrangible end a second inferior maximum appears in the orange portion of the spectrum. In the fourth experiment the exposure was increased to thirty-five hours. The image formed by "printing out" was now of an extremely feeble character, and quite different from that obtained in the former experiment, there being little signs of action elsewhere than under the yellow rays. On development in the ferricyanide bath a purple-red image was immediately produced, not so perfect in its gradation as the first (fig. 12), but still sufficiently vigorous to be capable of reproduction in facsimile. It is shown in fig. 13. The action is now strongest at the red end, the maximum lying in the orange. Midway between the green and the blue is a second point of actinic activity, whence, passing to the blue, there is a gradual falling off in the intensity, reaching a minimum dead level in the region of the indigo and violet rays. In the last experiment the print was exposed to light for ninety-five hours. This lengthy exposure failed, however, to produce an image by "printing out," another proof, if any were needed, of the gradual obliteration of the primary image by bleaching. On development in the ferricyanide bath the image flashed out in an instant, and speedily

\* Continued from p. 297, vol. 46.



obtained great vigour. Unfortunately, owing, no doubt, to the excessive exposure, the range of intensities was much obscured by the granularity of the red precipitate forming the image. However, the curious fact was sufficiently apparent that the blue rays had exercised the chief action—in other words, by increase of exposure, the image-producing influence had been transferred or displaced from the less to the more refrangible end of the spectrum. Hence there would appear to be two kinds of action to which the term secondary is properly to be applied, viz., (1) that which manifests itself by bleaching the image formed by "printing out," and (2) that which produces the displacement in the refrangibility of the chemically active rays of the spectrum that is, in certain circumstances, observable in the image produced by development.

#### EXPERIMENTS WITH COBALTIC FORMATE.

This salt is slightly sensitive to light, and may be prepared by dissolving cobaltic hydrate in warm dilute formic acid. So prepared, it forms a brownish-red solution, from which, on cooling, a portion of the hydrate is reprecipitated as a reddish mass. Paper sensitised with the cold clear solution of the formate was dried and duly exposed to light under a negative, but merely the barest outline of an image was produced, and that only after an exposure of from sixty to seventy hours' duration. The deposit was of a brownish-yellow colour, and was bleached by a further exposure of ten hours in sunlight. A feeble violet-red picture was obtained by developing this in the usual ferriocyanide bath. Four strips of the sensitised paper were then exposed in succession in the spectrum slide, the exposures lasting respectively 15, 65, 75, and 120 hours. In the case of the second experiment (exposure 65 hours) a faint orange band was produced by the impact of the yellow rays of the spectrum, but in the remaining experiments no image whatever was formed by "printing out." The exposed strips were successively developed in the ferriocyanide bath. The first gave a very faint brown image, in which the action of the light seemed to have been confined to the less refrangible portion of the spectrum, the maximum point lying in the yellow or the green rays. The second print gave an image almost identical with the foregoing. The third print instantly assumed a purple hue all over, and the true intensities were thus somewhat concealed. As before, however, the depth of the coloured deposit was more marked towards the red end of the spectrum, diminishing very evenly to a faint pink at the opposite end. The last print assumed a uniform but weak purple hue all over on being immersed in the developer, but a superimposed faint broad band in the yellow was also perceptible, as well as a narrow band in the blue, the latter, however, of exceeding feebleness. These experiments agree fairly well in serving to establish the conclusion that the disintegration of the formate is effected almost exclusively by the yellow rays of the spectrum.

#### THE WELLINGTON FILM.

A FORTNIGHT ago we made reference to a successful demonstration that had been given us of the new "dry" stripping film of Messrs. Wellington & Ward. We now append the principal instructions for the manipulation of the film, which is supported during exposure upon a paper backing. It may be exposed either in rolls or in cut sheets. After exposure, it is developed by any of the customary developing solutions, followed by an alum bath, and is fixed in the usual bath of hypo. When fixation is complete, the film is washed for a suitable time, and nothing more remains but to squeeze it down to dry upon a sheet of glass or ferrotype plate; after which, when dry, the film may be separated from the paper support.

The resulting film is flexible, possessing a fine matt surface, of sufficient body to stand rough handling, and may be protected against silver staining or humidity by being dipped bodily in any suitable varnish.

It is composed of no other substance whatever except the purest photographic gelatine. The entire support is thus as chemically inert, as regards the sensitive emulsion, as is the vehicle of the emulsion itself. Negatives upon the film may be printed from either side for carbon work or other processes in which such reversal is requisite. The matt surface lends itself well for retouching purposes.

As cut sheets the film may be employed in any dark slide, being backed up by cardboard, or other stiff material of sufficient thickness. The film may in like manner be used as cut sheets in any of the various forms of sheaths which are at present in usage for the purpose of holding celluloid film or negative paper.

The paper backing of the Wellington film is sufficiently translucent to permit the progress of development being judged in the usual way by holding up to the light. In this respect the new film resembles the negative paper formerly in use.

If desired, the exposed film may be soaked, before developing, in water for a few minutes until quite limp; it may be developed by any of the usual formulae. Messrs. Wellington & Ward, however, recommend pyro and ammonia for normal exposures, while pyro and soda is more suitable for instantaneous work.

#### PYRO AND AMMONIA (for Normal Exposures).

No. 1.	
Pyrogallic acid .....	1 ounce.
Sulphite soda .....	2 ounces.
Citric acid .....	40 grains.
Water to .....	10 ounces.

No. 2.	
Ammonia (880°) .....	1 ounce.
Water to .....	10 ounces.

No. 3.	
Potass bromide .....	1 ounce.
Water to .....	10 ounces.

Take 10 minims of No. 1 }  
 10 " " No. 2 } To each ounce of water.  
 5 " " No. 3 }

#### PYRO AND SODA.

No. 1.	
Pyrogallic acid .....	1 ounce.
Sulphite soda .....	2 ounces.
Citric acid .....	40 grains.
Water to .....	10 ounces.

No. 2.	
Carbonate soda .....	8 ounces.
Sulphite soda .....	8 "
Potass bromide .....	40 grains.
Water to .....	80 ounces.

Take 1 ounce No. 2; 1 drachm No. 1; Water, 2 ounces.

Negatives developed with ammonia strip perfectly from the paper support, whilst those developed with soda have a tendency to adhere more firmly; in some cases, if too much soda has been used in forcing, and through prolonged development the film may refuse to strip at all, this being caused by the alkali softening the gelatine and the paper so much that greater adhesion takes place between the two during drying.

No more soda should be used than is given in the formula.

*Alum Bath.*—Indispensable for preventing the curling up of the films during the after-process of washing. After developing, wash the negative in the usual manner. When freed from all traces of the developer, the film should be immersed in the following for fifteen minutes:—

Alum (ordinary) .....	2 ounces.
Water .....	40 "

*Fixing.*—The film must now be well washed and fixed in the following acid hypo bath, where it should remain for thirty minutes, taking care to turn them over from time to time to prevent unequal fixation.

No. 1.	
Hypo .....	1 pound.
Water to .....	70 ounces.

No. 2.	
Sulphite soda .....	2 ounces.
Sulphuric or acetic acid .....	2 drachms.
Water .....	10 ounces.

Mix by pouring No. 2 into No. 1.

*Washing.*—On removing from the fixing bath, wash in running water for about one hour.

The Wellington films have no tendency to damage one another by abrasion during the process of washing. The films still adhering to the paper support should now, without any further treatment, be squeezed to a ferrotype or glass plate (which has been thoroughly well cleaned with ammonia, whiting, and water, and, when quite dry, dust over the surface a little powdered French chalk, polishing off lightly with a dry cloth), allow to dry slowly in a cool place. It is advisable not to expose the film to the hot rays of the sun or to artificial heat, otherwise the film may become detached from the plate in the course of drying, thereby producing a wrinkled and cockled film. When dry, the film will easily detach itself from the glass plate.

No glycerine or spirit bath should be used, as after such treatment the films refuse to strip.

*Stripping.*—This process is, indeed, not absolutely necessary, since, if the paper backing be allowed to remain, the resulting negative may be printed in the same way as was customary with the old paper negative; but, inasmuch as most operators will prefer to have a negative which is translucent and prints as rapidly as glass, the exceedingly simple process of stripping will generally be adopted. Before proceeding to strip, make sure that the film is perfectly dry. Greater flatness will be secured by keeping the negatives a short time under pressure previous to stripping. The stripping of the film from the paper support



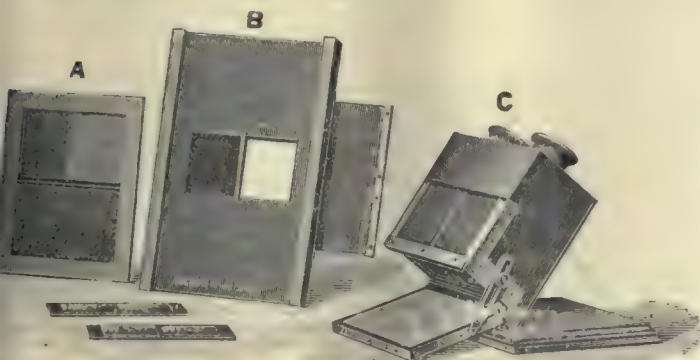
may then be conveniently started by cutting across one of the corners, film side up, with a sharp knife sufficiently to cut through the gelatine film only; then, by inserting the point of the knife between the film and paper, the two will be found to easily separate; now, with the back of the blade, loosen the film round the four sides. By gently pulling the transparent film from one corner, it will be found to easily leave the paper.

**Varnishing.**—For the prevention of silver staining, as well as to obviate any of the evil effects of dampness, the dried film may be conveniently varnished by dipping bodily into any suitable varnish which requires no heat, such as celluloid.

Sufficient varnish should be poured out into a flat dish, into which a single film should be immersed; lift carefully by two corners, allow to drain, and pin up to dry.

### THE "KROMAZ."

THE Kromaz is a system of colour photography enabling one to prepare transparencies, which, when viewed binocularly, show the object not only in relief, but also in colour. It is obvious, therefore, that between this system and the kromoskop method there is some analogy of principle, but it will be seen from the following description that the Kromaz differs greatly in detail from the older system:—



A—Set of colour screens in frame.

B—Repeating back, fitting into camera and taking half-plate slide, with screens in position.

C—Stereoscope for viewing photographs in colour.

The colour records consist of two pairs of images, which are produced by two exposures only in a single lens camera, the double image being secured in each case by means of mirrors. Of the first pair one image is given by the blue, the other by the red, and of the second pair both images are given by the green. Each pair is secured simultaneously; thus, the red and the blue are given together by the first exposure, and the two greens by the second.

The four images are all taken upon one half-plate, which is developed and fixed in the ordinary way.

The Kromaz back consists of a frame so designed as to be capable of easy adaptation to almost any front-focussing half-plate camera, by means of the dark-slide grooves. When fixed ready for use, the two square apertures are immediately behind the lens, and over them in parallel grooves the dark slide moves in such a way as to permit of the two halves of the plate being exposed in succession.

When the negative has been developed, fixed, and dried, a positive is taken from it, and this positive, when cut and mounted, constitutes the chromogram and may be viewed in the chromo-stereoscope.

The following extracts from the instructions will put the reader in possession of an outline of the plan of working the Kromaz:—

The three screens (one of them, the green, being double or stereoscopic) are arranged together in a frame which fastens on an ordinary half-plate dark slide, so that when the Kromaz back is fixed on the camera ready for taking, and the dark-slide shutter is withdrawn, the image from the lens can only reach the sensitive plate after passing through one or other of the colour screens, which robs it of all but the particular colour required to be registered at the exposure in question.

The back can be attached to almost any front-focussing half-plate camera.

A plate sensitive to all the colours of the spectrum is necessary.

These plates should be put in the dark slide in almost total darkness, as, owing to their sensitiveness to red, they would be quickly fogged by the ordinary ruby light of the developing room.

In the Lumière panchromatic or Cadett spectrum we have a plate sensitive to all the colours of the spectrum, but not in an equal degree, for the red and the green require to act on the plate several times as long as the blue to secure their proper effect. A fair average ratio of exposure

for the three colours is blue, 1; red, 10; green, 7; but by the Kromaz system the red and blue are paired and given the same exposure, and this is accomplished by slowing down the blue to the red by cutting off a large proportion of light with an orthochromatic screen.

**Making the Positive.**—Much of the success of the final result depends upon the quality of the positive taken from the negative.

The simplest way to obtain it is by contact printing in a printing frame. A Cadett photo-mechanical plate gives excellent results, the most convenient light being that given by an ordinary candle; the frame should be held about thirty inches from the flame and waved about slightly—the exposure of from two to three and half minutes according to the density of the negative is longer than that required when using a gas flame or daylight, but it is much more reliable, and a good positive can be obtained with greater certainty than by other means. *Development must not be too quick*, use a weakened solution of the developer, and aim at producing softness of image with long gradation.

**Cutting and Mounting of Positives.**—Before cutting the positive for mounting, hold it up to the light and place one of the mounts over a pair of the pictures. Mark the film at the outer edges of the mount, then lay the positive on a table and cut the film right across, but slightly smaller than the outside size of the mount; this is done to prevent any danger of the film dragging away from the glass when the latter is broken after being cut with a diamond or glass-cutter; it also serves as a convenient guide when cutting the glass.

To mount the positives, first take the pair of green images and lay it, film downwards, upon the mount, securing it with gummed slips of paper. Then, after it has been set aside for a few minutes to dry, slide it into the back of the Kromaz, film outwards, and push it as far as it will go. Next take the second mount and put it over the coloured screens on the top of the Kromaz, push it as far to the back and to the left as it will go, and then drop the remaining pair of images, film downwards, upon it. Shut the right eye and move the glass (not the mount) until the blue image falls exactly over the green, and colour fringes cease to be visible, then superimpose the red image in the same way, and finally secure the glass to the mount as before. If, when the chromograms are dry, it is found that they have altered slightly and the images in the Kromaz will not quite superimpose, the mounts may be filed at the edges until correct registration is obtained.

We have examined a number of results produced in the Kromaz, and found them exceedingly good. The Kromaz appears to be a simple and easily acquired method of producing stereoscopic transparencies in colours, and will, doubtless, be popular.

## Our Editorial Table.

### THE RAY CAMERAS.

A SELECTION of these handy little cameras of American manufacture has been shown us. One of them, Series No. 7, is adapted for tele-photo work, having a considerable range of focus. It has been especially designed for the convertible anastigmat, or lenses with variable foci. It is constructed with an auxiliary bed, which can be racked out over the ordinary bed to almost its entire length, giving a variation of focus in the 4×5 size of from 4½ to 12 inches, and in the 5×7 size from 5 to 15 inches. The auxiliary bed is made of aluminium, so formed as to make it extremely rigid, and its highly polished surface, in contrast with the



polished and lacquered brass, and mahogany finish, makes it an extremely attractive and elegantly finished camera. The other feature is the reversible back, by means of which pictures can be taken vertically or horizontally without changing the position of the camera on the tripod. It is also provided with swing back, rising and sliding front.

Series No. 2 is the tourist or cycle folding camera. A rack-and-pinion focussing attachment makes it very desirable for fine focussing, also a sliding front movement will be found convenient in making vertical pictures. The detachable lens board is a handy arrangement, whereby the shutter and lens can be removed and a wide-angle or any other lens inserted in an instant, thus doing away with unscrewing the shutter,



whereby the fine mechanism is often injured, and the annoyance caused by different-sized lens flanges is avoided. Extra duplicate lens boards can be secured at any time and fitted to any lens it is desirable to use in the camera.

A typical specification of the Ray Camera, that of Series No. 7, is as follows: (1) Polished mahogany case, bed and front; (2) Covering, fine morocco grain leather; (3) Bellows, fine maroon, extra long; (4) Trimmings, polished and lacquered brass and aluminium; (5) View-finder, brass top; (6) Rising and falling front; (7) Time, instantaneous, finger and pneumatic release shutter; (8) Iris diaphragm; (9) Sole leather carrying case; (10) Ground glass and focussing scale; (11) One tripod nut; (12) Leather handle; (13) One double holder; (14) Sliding front; (15) Detachable lens board; (16) Aluminium auxiliary bed; (17) Double rack-and-pinion focussing attachment; (18) Swing back; (19) Plate-holder adapter; (20) Reversible back.

#### CONVENTION PHOTOGRAPHS.

MR. W. D. WELFORD, of 19, Southampton-buildings, Chancery-lane, W.C., is good enough to send us half-a-dozen snap-shots taken during Convention week at Gloucester. They include clever and characteristic portraits of Mr. Bridge, Mr. Dugdale, Mr. E. Banks, Mr. E. J. Humphery, Mr. S. B. Webber, Mr. A. Seaman, and others, and in one of the groups it is alleged that the President-Elect is depicted giving utterance to the phrase, "It shall be done." We shall prize Mr. Welford's excellent photographs as souvenirs of a most enjoyable meeting.

PROMPT, as usual, to seize the opportunity of the moment, Mr. W. F. Slater, of 5, Firs-parade, High-road, Lee, S.E., has sent us a nicely framed copy of the Convention group. The frame is in Mr. Slater's best style, being of an elegant design, in wood, of a delicately tinted green. Mr. Slater's frames are always good and tasteful, and this one is no exception to the rule.

#### SPECIMENS OF ENLARGING, TRADE PRINTING, &c.

The Maxwell General and Photographic Illustrating Company, 44, Hatton-garden, E.C.

THE Maxwell Company undertake photographic printing, enlarging, developing, mounting, finishing, retouching, and lantern-slide making. Some of their enlarging work was on view at the Convention, and we have since had an opportunity of more closely examining a number of the specimens. These, upon inspection, show the work to be of a very high order of merit, both pictorially and technically, rich blacks and pure whites characterising the results. We wish the new Company success. On the occasion of the Convention excursion to Tewkesbury a cinematographic picture of the members leaving the boat was taken by a representative of the Company. A portion of the film has been shown us, and we perceive that it contains a number of easily recognisable portraits of prominent Conventioners.

DIE LICHTPAUSVERFAHREN, DIE PLATINOTYPIE UND VERSCHIEDENE COPIRVERFAHREN OHNE SILBERSALZE.

DIE PHOTOGRAPHISCHEN COPIRVERFAHREN MITTELS MANGAN-, COBALT-, CERIUM-, VANADIUM-, BLEI-, UND ZINN-SALZEN UND ASPHALT.

Wilhelm Knapp, Halle a/S.

THESE two publications form Parts 2 and 4 of Vol. IV. of Dr. J. M. Eder's *Ausführliches Handbuch der Photographie*, second edition. Both books are characterised by the same careful and complete compilation which Dr. Eder has exhibited throughout this standard work. The chapters on platinotype will, doubtless, be welcome to many whose attention has again been directed to the process by recent developments, and those in search of novel effects of colour may consult with advantage the details of the manganese processes given in Part 4. It is much to be regretted that an English translation of Dr. Eder's work has not been made.

WE have received an advance press copy of the Great Eastern Railway Company's *Tourist Guide to the Continent*, published at 30, Fleet-street, at the price of 6d. Among its fresh features are particulars of the new express service to Norway, Denmark, and Sweden, *via* the Royal Mail Harwich-Hook of Holland Route; of new tours in the Luther Country, and Thuringian and Hartz Mountains, a series of Continental maps, and a chapter, "Dull, Useful Information," giving particulars as to the cost of Continental travel.

#### CATALOGUES RECEIVED.

Isenthal, Potzler & Co., 85, Mortimer-street, Cavendish-square, W.

THIS catalogue has been compiled for the use of those who make the application of the principles of radiography a practical study. Induction

coils, tubes, screens and fluoroscopes, plates and films, accumulators and storage batteries are freely illustrated and described, and the radiographer will thus find the catalogue of the very greatest service to him. It is sent out at a charge of threepence.

McGhie & Co., 75, St. Vincent-street, Glasgow.

THE latest catalogue of Messrs. McGhie is an extremely well-printed production of over one hundred and fifty pages. There are between two and three hundred illustrations, and the catalogue appears to completely cover the ever-widening field of photographic supplies. It appeals alike to professionals and amateurs.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, August 2, at eight o'clock. Demonstration of Kachin by Messrs. Griffin & Son.

THE South London Photographic Society's Third Continental Excursion to Belgium takes place August 19-27. The leaders are Messrs. William F. Slater, F.R.P.S., and Walter D. Welford, F.R.P.S. The estimated total cost is 3*l.* 16*s.*, including saloon on boat. Any further particulars may be obtained from Messrs. William F. Slater, 5, Firs-parade, High-road, Lee, London, S.E.; and Walter D. Welford, 19, Southampton-buildings, Chancery-lane, London, W.C.

THE ARTISTS' GUILD.—Princess Christian offers prizes for embroidery at the Eleventh Amateur Art Exhibition of the Artists' Guild, to be held at the Royal Albert Hall in November. Prizes are also offered for painting, carving, photography, and work in leather and metals, &c. The competition is open to all amateurs. By special desire of Her Royal Highness, the Exhibition will be enlarged by a Section for Advanced Art, open to skilled artists, professional or otherwise. Particulars will be sent, on receipt of a stamped and addressed envelope, by the Secretary, the Artists' Guild, Exhibition-road, S.W.

ON Friday last week the staff of the Platinotype Company had their annual excursion to Folkestone. The weather was perfect, and a party of about ninety ladies and gentlemen reached the beautiful Kentish watering-place at an early hour. Carriage excursions to Hythe and neighbourhood were made both in the morning and afternoon, and a number of old English games were indulged in. Mr. E. J. Humphery presided at the luncheon at the Queen's Hotel, Folkestone, and he was supported by among others, Mr. Willis, Mr. W. H. Smith, Mr. Bedding, Mr. Wall, &c. After tea the party returned to town, obviously well pleased with a delightful day's outing.

THE Croydon Camera Club's Third Exhibition will be held at the Art Gallery, Park-lane, Croydon, on Wednesday, Thursday, Friday, Saturday, Monday, and Tuesday, October 18 to 24, 1899. The Judges are Mr. A. Horsley Hinton, Rev. F. C. Lambert, and Mr. Percy S. Lankester. The following are the Open Classes: H, Champion Class, pictures which have previously received an award, gold medal; I, pictures which have not received any award or certificate, silver and bronze medals; J, any subject, open to amateur photographers resident in the borough of Croydon, gold, silver, and bronze medals; K, lantern slides, set of six, silver and bronze medals; L, stereoscopic prints and transparencies, set of four, silver medal; M, not for competition, exhibits invited. Entry forms and further particulars can be obtained from the Hon. Secretary, Mr. W. H. Rogers, 106, Holmesdale-road, South Norwood.

MR. ALDERMAN G. P. WOODRUFF, J.P. (Mayor of Hove and President of the Hove Camera Club), in order to encourage artistic photography, has offered the sum of 5*l.* 10*s.* for prizes in a competition to be open to those only who have not previously taken an award of any kind in photography. The principal conditions are as follows: The prizes will be in photographic goods at Williamson's Stores, Western-road, Hove, and the winners will select whatever they wish to the value of first prize, 3*l.*; second prize, 1*l.* 10*s.*; third prize, 1*l.*. Only those amateur photographers who are members of the Hove Camera Club or reside in the town of Hove, and have not previously gained an award in any photographic competition, either open, club, or otherwise, will be allowed to compete. The entry forms must be sent in by September 21, and prints on or before September 26, 1899, to the Hon. Secretary, Mr. C. Berrington Stoner, 24, Holland-road, Hove.

THE Executive Committee of the Affiliation of Photographic Societies held a meeting at No. 68, Russell-square, W.C., on Thursday, July 13, Mr. G. Scamell (Hon. Treasurer) in the chair. The following lectures, with the authors' names as appended, were arranged for, and they will be ready for circulation, it is expected, by October 1: "Elementary Chemistry for Photographers," by Mr. C. F. Townsend; "Orthochromatic Photography," by Mr. E. Sanger Shepherd. Negotiations were opened for three lectures on the following topics: "Practical Photography in the Field," "Printing Dodges," "Photography by Artificial Light." It was arranged that, during the summer months, those of the old series of lectures which were not booked should be withdrawn for revision and set in order for the coming winter session. An offer from the Toronto Camera Club of a set of slides representative of Canadian work was accepted by the Committee, and it is hoped to have the set in circulation by the end of the autumn season. It was also agreed to exchange a set of slides by British workers with the American Lantern-slide Interchange in return for a similar set by American workers.



A FIRE broke out last week in the cellar of the premises of Mr. Andrew Baird, scientific-instrument maker and chemical dealer, 37 and 39, Lothian-street, Edinburgh. The outbreak was discovered shortly after two o'clock by a passer-by, who observed smoke issuing from the grating underneath the shop, and he at once ran to the Royal Infirmary and put himself in communication with the fire office. A couple of steamers were soon on the spot, but the firemen found themselves confronted with a difficult and even dangerous task. It was naturally assumed that a large quantity of chemicals were stored in the cellar, but as to the nature of the stuff, and consequently the exact danger of their position, the firemen were totally ignorant. To add to the difficulty of the work, the fumes from the cellar were so overpowering that it was impossible to get at the seat of the fire, and Mr. Portage had to break up the pavement before he could find access to the cellar. A number of alarming enough explosions took place, but the fire was extinguished before anything of a very serious nature occurred. A large case of methylated spirits and a quantity of ether were afterwards discovered, which the fire had fortunately not reached. The fire was regarded as of such a serious character that it was deemed advisable to remove all the families living in the tenement above the premises. Although occurring at such an early hour, a large crowd collected.

THE following is the list of winners in the Warwick Monthly Competition:—104 prize, *Interior of Lucerne Cathedral*, Mr. J. C. Oliver, 2, Royal-terrace, Glasgow; 51. prize, *Lady Standing before Window*, Mr. G. Speight, photographer, Market Harborough; 11. prizes, *Threshing Corn with Cattle in the Swat Valley*, Mr. W. P. Murray, 21st Punjab Infantry, Malakand Force, India; *Snap-shots of Barnum's Procession*, Mr. W. Wilkinson, Erwen-road, Colwyn-bay; *Sir Evelyn Wood Reviewing the Sandhurst Cadets*, Mr. G. E. Clarke, photographer, Camberley; *Open Door, Stanwell Church*, Mr. Hilton Grundy, Brentford, Middlesex; *In Cassiobury Park*, Mr. A. G. Lawson, 32, Ashley-road, Crouch-hill, N.; *Waiting*, Mr. J. T. Hall, engineer, London-road, Staines; *Snap-shot of a Game of Tennis*, Mr. G. L. Lavender, Aldridge, Staffs; *The Nave Chester Cathedral*, Mr. F. W. Knowles, photographic dealer, Warrington; *Pleasant Pastures*, Mr. J. W. Mills, 24, Clifton-street, Warrington; *A Thames-side Village*, Mr. H. E. Davis, Camera Club, London, W.C.; *On the Sands at Margate*, Mr. James Dee, photographer, Earley, Reading; *The Pets—Girl, Donkey, and Dog*, Mr. Henry Neville, 81, Revidge-road, Blackburn; *Copy from Water-colour Painting*, Mr. H. F. Hadland, 14, Gooding-road, Holloway, N.; *Portrait of a Boy Reading Paper in a Chair*, Mr. Herbert Kay, 1, Premier-street, Brooks Bar, Manchester; *The Ancestor*, Mr. J. H. Edwards, 101, Newhall-street, Birmingham; *An Irish Donkey Cart*, Mr. F. J. R. Macfadyen, The Gables, Monkseaton; *Washing Sheep*, Miss G. A. Jones, Stanington Vicarage, Cramlington; *A Corner of a Quay*, Mrs. Norman Macdonald, Coll, Earn, Auchterarder; *White Rhododendrons Growing*, Mrs. Ford, Quarrydene, Westwood, Leeds; *Young Girl Standing in Light Dress*, Madame Marie Weale, photographer, Helios Studio, Nuneaton.

## Patent News.

THE following applications for Patents were made between July 10 and July 15, 1899:—

CAMERAS FOR COLOUR PHOTOGRAPHY.—No. 14,364. "An Improvement in Cameras for Colour Photography." A. J. O. POLLOCK.

PANORAMIC CAMERAS.—No. 14,548. "Improvements in Panoramic Cameras." Complete specification. C. H. SHAW.

SENSITIVE PLATE-HOLDERS.—No. 14,563. "Improvements in Holders and Envelopes for Sensitive Photo Plates." P. WALLIS and E. F. WALLIS.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
1.....	Hackney.....	Open Night.
1.....	Oldham.....	Excursion: Prestbury. Leader, J. T. Whitehead.
2.....	Photographic Club.....	Demonstration: Kachin. Messrs. Griffin & Son.
2.....	West Surrey.....	Demonstration: Sensitising Paper. J. Bulbeck.
3.....	Hackney.....	Excursion: Christ's Hospital (Interior) Leader, H. J. Webb.
5.....	Ashton-under-Lyne.....	Excursion: Worsley. Leader, W. Greenwood.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 20.—Mr. R. P. Drage in the chair.

The CHAIRMAN said it was his pleasant privilege to hand to Mr. T. E. Freshwater, the late Secretary, a testimonial from the members, which, it would be remembered, was initiated at the very enjoyable outing which they had at Mr. A. L. Henderson's home at Brimsdown. He had great pleasure in testifying to the worth of Mr. Freshwater, and could speak, from personal acquaintance with the office of Secretary, to the fact that the Society owed a great deal to him for its present position. He still hoped that, though leaving

the Society in an official position, Mr. Freshwater would long continue to give his aid and support to the Association, and, with a firm trust in this conviction, he formally presented to the retiring officer a handsome timepiece, suitably adorned with an engraved inscription.

Mr. PHILIP EVERITT, who carried out the duties of collector on behalf of the fund, supported the Chairman's eulogy of Mr. Freshwater, who afterwards replied and thanked the members for their present.

Mr. J. E. HODD detailed some trials of ammonium persulphate which he had recently been making, and took the opportunity of protesting against the scant directions which the vendors saw fit to issue with this salt. He had been reducing with a three per cent. solution, and got every effect expected except that, after washing, the plate was covered with blisters. These he endeavoured to lay down with spirit and by pricking, but was desirous of learning whether the same fault had been observed by others. He explained that he had not soaked the plates for long, they were only washed for about half an hour, and that in running water. The persulphate solution was quite fresh.

Mr. J. S. TRAPE, as one who had had some experience with the new reducer, said he could not account for it. He had noticed, however, that the solution in four per cent. strength or thereabouts had a distinct solvent action upon gelatine, half an hour's sojourn therein being enough to dissolve away about half of the quantity of the gelatine which was on the plate.

Mr. P. EVERITT said that Liesegang had remarked upon the effect of and used old solutions as a means of dissolving away parts of the gelatine in order to get an image in relief. An acid solution would probably have the same effect.

Mr. HODD said that he noticed that the solution turned cloudy on the introduction of the plate.

Mr. J. A. SINCLAIR said he believed this was usually the case.

Mr. EVERITT said it was general knowledge that different samples had been found to act differently upon the silver image. Reverting to the observations of Liesegang, he said that, after the publication of his conclusions, Colonel Waterhouse essayed to repeat them, but did not succeed, and wrote to Liesegang to this effect. Liesegang again went through the experiment, and found that the phenomenon was due to the fact that he had been using an old solution. He also found that a fresh solution exercised the same effect if acidulated.

Mr. S. H. FRY asked whether it might be confidently assumed that the results after reduction by persulphate were not liable to change.

Mr. TRAPE, in reply to a question, said that the length of washing which was necessary after reduction depended upon the gelatine of which the emulsion was made, but half an hour was a fair average.

Mr. A. HADDON said that the proper procedure would be to wash well after immersion in the sulphite, and afterwards fix in a strong hyposulphite bath. The persulphate formed sulphate of silver during the process of reduction, and the washing water partly converted this to chloride. Obviously this should be removed, and therefore the plate should be treated with hyposulphite. If not done, the plate would be affected by light. Sulphite only stopped the action of the persulphate, and was not an energetic fixer. Sulphite, however, should not be dispensed with. If only hypo were used, there was likely to be a deposit of sulphur. It was important that after the sulphite the plate should be well washed and then treated with hypo.

Mr. EDWIN BANKS said he had seen negatives reduced with persulphate which in a few weeks darkened appreciably through the presence of free silver. As the last speaker remarked, they should have been fixed in hypo afterwards. No negative was safe without it. There was no loss of quality as a result of the fixation. The sulphate formed by the reducing salt was not very soluble, and, moreover, it is in close union with the gelatine, and not easy to remove.

### PHOTOGRAPHIC CLUB.

JULY 19.—Mr. F. A. Bridge in the chair.

Mr. E. W. FOXLEE referred to the exhibition, by Mr. Müller, of one of the impressions made by the electric inkless printing machine, which, after a fortnight, became a deep yellow-brown colour all over. Mr. Foxlee said he had an impression made at the same time, but printed on one side only, which he had left on the mantelpiece quite unprotected, but no visible change had taken place. He rather suspected that the change had been wrought by exhalations from the dye of the pocket or coat in which it had been kept.

Professor STEBBING, of Paris, passed round a number of photographs made at his studio. Theatrical beauties formed the subjects in most, if not all, the pictures shown, and the great diversity and freshness of their pose was very much admired. He said that albumenised paper was the printing method he employed, and that gelatine and collodio-chloride papers found little demand amongst Parisians. The question of copyright arose in connexion with a remark that one of his pictures had been reproduced, and it was stated by the Professor that in this matter of reproduction he found the German proprietors more honest than English publishers. There was a long discussion as to fighting cases of infringement, whether piratically or innocently done, and the help afforded by the Copyright Union to this end was especially mentioned. The point was also discussed as to whether, upon a case of unauthorised reproduction of an unregistered photograph, subsequent registration should be retrospective or not. Two or three spoke to the effect that the reproduction of certain photographs practically destroyed all chance of further sale, and the opinion was also expressed that publishers were sufficiently pressed as matters now stood, and several injunctions and penalties were named.

### Croydon Camera Club,—July 19.—

#### MY EXPERIENCES WITH KINEMATOGRAPHS

formed the subject of a chat given by Mr. MACLEAN at the above Club to a gathering of members which, considering the time of year, may be described as quite flattering. The lecturer prophesied the early and complete popularity



of this form of photography amongst amateurs, for not only was it comparatively inexpensive, but quite well within the power of any ordinary photographer. As regards the first point, he said a negative film which would show a picture of the usual length (about one minute) costs but the price of a dozen half-plates, whilst, as to ease and manipulation, Mr. Maclean handed round prints of his first attempt, which exhibited every indication of complete success. The construction and method of using various miniature cinematographs were next explained, the Birtac, which was highly commended by the lecturer for its reliability, being first shown. Next came the Biokam, which was described as a remarkable assemblage of ingenious ideas in a very compact form. This camera, which costs but six guineas, is not so large as an ordinary hand camera. The above were both shown in action, and their various merits compared. Each one was found to possess special advantages, which are the most important it must rest with the individual to decide. The procedure followed by the lecturer in winding the long celluloid ribbon on to a winder formed of cross metal rods studded with pins, and developing it by immersing the whole in a twelve-inch by ten-inch dish, was duly explained. A number of useful hints derived from practical experience with cinematographs were amongst the most interesting of the remarks, including, as they did, several laughable anecdotes of unrehearsed effects which were met with.

### FORTHCOMING EXHIBITIONS.

1899.

- August ..... One-and-All Flower Show at the Crystal Palace (Photographic Classes). Hon. Secretary, E. O. Greening, 3, Agar-street, Charing Cross, W.C.
- Sept. 22-Nov. 4 ..... Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.
- „ 25-Nov. 11..... Royal Photographic Society. Hon. Secretary, Colonel J. Waterhouse, 12, Hanover-square, W.
- October 18-24 ..... Croydon Camera Club.
- „ 22-Nov. 19... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.
- Nov. 27-Dec. 18 ..... American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.
- December 7-9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPH REGISTERED:—

A. H. Pestel, 49, Terminus-road, Eastbourne.—Photograph of H.R.H. the Prince of Wales.

ADDRESS WANTED.—R. T. W. says: "Can you tell me the address of Barr, the lens-maker, as I want another flange for 15 x 12 lens."—The address is Wakefield-street, East Ham, London.

GLENDROCK.—Our reply was based on the assumption that Russia was a signatory to the Berne Convention. If she is not, then of course you have no remedy. Sorry if we have (unwittingly) misled you.

AGREEMENT.—EMPLOYER. Your queries involve two or three very knotty points, upon which we are unable to give an authoritative opinion. We should advise you to consult your solicitor on the matter. If you do, he will probably advise that counsel's opinion be taken on the subject, as several intricate points of law are involved.

POSITION OF STOPS.—HERTS. Some of the earliest portrait lenses by A. Ross were fitted with stops in front of the anterior lens, in the hood, so they were by most of the early makers; but the proper position is as they are now fitted, i.e., between the glasses. The instrument you have can be fitted with stops in that position with advantage, the cost would not be great.

LANTERN SLIDES.—C. WICKS. You are confusing two processes. What are known as glass positives are of no use for the lantern, as they would show on the screen as negatives. The term "diapositive" which is used on the Continent is a transparency made from a negative.

REPAIRING PORCELAIN DISH.—J. J. J. If the dish is broken in three pieces, we should say it would be a waste of time to try to repair it, so as to be used again for photographic purposes. The cost of a 12 x 10 dish is so small as to make the attempted repair not worth the trouble.

BRITISH MUSEUM.—H. CROFTS. Permission will have to be obtained before you will be allowed to photograph any object in the British Museum, or to take photographs of any of the rooms generally, and, in fact, to take a camera at all into the building. Make an application in writing to the Trustees, and it will, doubtless, be granted if your object is explained in the application.

SENSITISING PAPER.—P. McAVOY says: "In trying to sensitise some rough drawing-paper, after salting it with a fifty-grain solution of nitrate of silver, I find that the cotton-wool used discolours directly it is put into the solution, and, when the paper is coated, streaks show in the direction it is applied. Is it the fault of the silver?"—No; evidently the cotton-wool contains some deleterious matter.

REGISTRATION OR PATENT.—INVENTOR says: "I have invented a hand camera which I believe is an entire novelty, and I do not wish to go to the expense of patenting it. Could I not protect it by some sort of cheap registration like designs are registered?"—No; the only way of protecting an invention of the kind is by means of a patent. You may register a name for the apparatus, but that will not prevent any one else from making it.

BOOK ON WET COLLODION.—AJAX says: "Can you recommend me a handbook to the wet-collodion process? In the ALMANAC for 1896 is a most excellent paper on the subject, but it does not deal fully with small details. I have Captain Abney's *Instruction in Photography*, but I want a handbook devoted to wet collodion only."—In reply: The *Wet-collodion Process*, by Mr. C. W. Gamble, published (we believe) by Dawbarn & Ward, might suit your requirements.

BLACK TONES ON P.O.P.—WATERLOO says: "1. Will you kindly give me a formula for obtaining black tones on Ilford P.O.P. so that the prints will appear to be Velox or Gravura? I saw the following in a paper some time ago, but it will not act: Water, 16 ounces; powdered chalk, 100 grains; calcium chloride, 2 grains; gold chloride, 2 grains. 2. Are the operations different to ordinary toning?"—1. We know of no toning bath that will yield prints that will appear as if they were on either of the two papers mentioned. Why not use either of those papers? 2. Both Velox and Gravura are development papers.

INSURANCE.—J. W. It is very general for insurance companies to limit in the policy the value of the negatives to a certain sum as a maximum, usually a shilling. It does not follow, however, that they will pay the shilling each for all the negatives destroyed in the case of fire. It will have to be proved that they all are worth that sum, and many old-stock negatives are worthless. You say that you have "many negatives that are worth pounds each, and it would be hard to have to accept a shilling each for those in the event of accident." Quite so, but the fire insurance companies will insure the more valuable ones separately for any sum that may be agreed upon at an enhanced premium.

HALF-TONE FOR CONTACT PRINTING.—AJAX says: "1. When photographing an object which gives dense heavy shadows, impossible to avoid, would there be any advantage in using a ruled screen in front of the dry plate? I enclose a platinotype print to show my meaning. Would the use of a ruled screen break up the dense blackness of the seat on which the figure is seated, also the shadows on the face, and so enable me to get a better print on paper? I do not want to make zinc blocks from the negatives. 2. Verfasser's *Half-tone Process*, which you recommended to me last week, is an excellent guide. Can you tell me of a similar work on line-block making?"—1. We should say not. The fault in the enclosed picture is that the negative was much under-exposed and over-developed. Give more exposure, and soften the shadows by lighting them up by means of a reflector. 2. *Photo-zincography*, by Fritz, published by Dawbarn & Ward.

DISCOLOURED PRINTS.—G. & A. BARBER write: "Will you please answer my letter through your Answers to Correspondents column or per return post. I enclose print which has been toned and fixed along with about a hundred more. I sent the print (which had not been in alum) to a fresh firm for enamelling (collodion), and they wrote and told me that my prints, on being put through the preparations for enamelling, all changed colour. They sent me five or six back, and, as the lot they sent back didn't seem to have changed much, I wrote and told them to let me have finished prints home as soon as possible. They say the prints change colour through imperfect fixation, but the remainder of batch, toned and fixed same time, which I mounted and sent out (plain), did not change the slightest. 2. Will you let me know if putting them in alum after they have been fixed and washed will change them if they are not properly washed after alum? 3. Can you tell me the preparation they mention which has turned their colour. 4. As the photographs could not be sent out, and I have had others to start printing in their place, and if, as I think, they are to blame, did not they ought to allow me something for my delay, trouble, and expense? I enclose copy of their letter, which they kept counterfoiled, and should be glad either for reply per return or through your valuable paper."—1. The print you send bears unmistakable evidence of imperfect fixation. 2. Not if they are perfectly fixed and washed. 3. Probably a simple solution of gelatine. 4. No, as the fault does not rest with them,



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## EX CATHEDRA.

IN the battle of the printing processes that is being continuously waged amongst photographers the carbon process occupies a unique place. It is rarely, if ever, subjected to attack on the score of any intrinsic disadvantages it may be supposed to possess. The scope for chemical or physical drawbacks or difficulties is narrowed down to the most confined compass when your printing process is one by which you form your image of finely divided carbon pigment in pure gelatine. Herein the physics and chemistry of photographic printing find their simplest expression. Practically speaking, beyond the insolubilising action of light on the bichromated gelatine no strictly chemical reaction takes place in the process, and "development," if it may be properly so called, introduces no complications whatever. Chemically regarded, carbon or pigment printing is the simplest of photographic printing processes.

UPON the æsthetic charm that always characterises a good carbon print it is not necessary for us now to dilate, nor need we dwell upon the many special purposes to which the process

may be adapted. But we have found ourselves reflecting that amid all the controversy that rages upon the merits and demerits of albumen, gelatine, collodion, bromide, or platinum, carbon printing appears to escape any serious amount of objection. The number of those who use the process is perhaps gradually on the increase, and we seldom, if ever, hear of a case of its being abandoned. There must be something peculiarly satisfying in a photographic printing process which after nearly forty years of existence still finds undiminished favour.

\* \* \*

ALMOST while we have the pen in hand, the Autotype Company, of 74, New Oxford-street, write us on the subject as follows: "There can be no doubt as to the increasing popularity of the carbon process, and, from our experience in supplying material and apparatus, we find that some amateurs hesitate as to taking up the process, believing that, in order to work successfully, a somewhat costly and complicated installation is necessary. This erroneous notion we have sought to remove, and we believe the introduction of this thoroughly practical set at a moderate price should prove a great boon to the amateur."

\* \* \*

THE set to which the Company refer consists of the following articles: Printing frame and pad, simplex actinometer, sensitive tissue (two dozen half-plate or four dozen quarter-plate), single-transfer paper (two dozen half-plate or four dozen quarter-plate), slate mounting slab, squeegee, blotting boards, two cold-water dishes, one developing tank, enamelled alum dish, box of powdered alum, book of instructions, *First Steps in Autotype Printing*; and the cost of the outfit is fifteen shillings. This set, which is excellent value, appeals to the amateur worker, who, never having tried carbon printing, would, we are sure, be delighted with the ease and simplicity of printing by "water development." We have much pleasure in giving publicity to the fact that the Autotype Company make special provision for amateurs desirous of taking up carbon printing.

\* \* \*

WE have received the Annual Report of the Council of the Röntgen Society for the year ending June 30, 1898. Mr. Wilson Noble is the President for the year 1899-1900, and the new



Hon. Sec. is Mr. F. H. Low, M.B., 12, Sinclair-gardens, West Kensington, W. A perusal of the report shows that much useful work has been accomplished by the Society in discussing the phenomena of radiography. The Society now numbers 148 ordinary and 5 honorary members, and the Council say that "fresh evidence is being continually received of the value of X rays in surgery, and the Council believes that there is much useful work open to the Society in the way of stimulating improvements and apparatus and in methods of investigation."

A BRIEF communication from Mr. Frederic E. Ives apprises us that his present address is 1324, Chestnut-street, Philadelphia, U.S.A. The kromskop system of colour photography is being prominently exploited in the States by Mr. Ives himself, and he tells us that very important improvements have recently been made in the instrument and that new patents have been obtained. The improved kromskops and appurtenances will be ready for sale on September 1.

MANY photographic firms will, doubtless, wish to have a resident representative in Paris during next year's great Exposition. We are asked by Professor Stebbing, the well-known photographer, of 30, Rue de Grammont, Boulevard des Italiens, Paris, to state that he will be in a position to accept agencies of this character, and will have the time to devote himself to the interests of photographic houses taking part in the Exposition. Professor Stebbing's long acquaintance with all branches of photography should qualify him to act to the best advantage in such a position.

THE *Journal* of the Royal Photographic Society states that, at a meeting of the committee of the Liverpool Section of the Society of Chemical Industry, held on March 16, 1898, it was decided to establish a memorial to the late Dr. Ferdinand Hurter, as a recognition of his work in applied chemistry and masterly investigations. The memorial is to take the form of a Hurter Memorial Lecture, associated with the Liverpool section of the Society, which will be given in alternate years on some subject connected with applied chemistry. In order to provide a suitable honorarium for the lecturer, a sum of at least 300*l.* is required, and the Hurter Memorial Committee have issued an appeal for help in raising the sum necessary for the endowment of the lecture. About 250*l.* have been subscribed, and the Hon. Secretary of the R.P.S. will be glad to receive further subscriptions to the fund from members of the R.P.S. who may wish to subscribe to a memorial of one who has done so much for the science and practice of modern photography.

MESSRS. R. & J. BECK, of 68, Cornhill, write us: "In an account in most of the daily papers of Mr. Percival Spencer's adventurous trip across the Channel in a balloon, by an error it was mentioned that he used a French camera. We should be glad if you would point out to your readers who may be interested in the matter that it was a 5 × 4 Frena camera that he used, carrying its forty films like a pack of cards." We have much pleasure in complying with Messrs. Beck's request. An account of Mr. Spencer's trip appears in another part of this week's *JOURNAL*.

THE English expedition to America to observe the total solar eclipse of May next will be in charge of the Rev. J. M. Bacon, whose work in connexion with the Indian Eclipse Expedition, and later in the way of balloon and wireless telegraphy experiments, is well known. Mr. Bacon will be accompanied by Mr. Nevil Maskelyne. It is considered that there will be a better chance in the United States of getting valuable observations of the May eclipse than in either Spain or Algiers, where stations will also be established.

A RECENT issue of the *Daily Mail* contained a humorous account of a curious adventure which lately befell a party of amateur photographers at Barmouth. They went out fishing and returned with an abnormal catch of bass, a circumstance which excited considerable comment and suspicion. The rest of the tale is best told in the *Daily Mail's* own words: "A day or two later the climax was reached. The three mysterious visitors went out for a sail, taking their cameras with them, and on their return they found 'Hawkshaw,' an elderly gentleman, waiting for them, who, immediately they stepped on shore, demanded to search the boat and tackle. Mr. Charles Bassano absolutely refused to allow him, whereupon 'Hawkshaw' produced a certificate, showing that he held the post of inspector or some similar office. 'Right you are,' said the trio, and forthwith they proceeded to get the cameras out of their cases. But the crafty Hawkshaw was not to be deceived—he must see the inside there and then of these boxes. Mr. Bassano to this retorted that, if 'Hawkshaw' dared to open the cameras, except in a dark room, he would sue him for damages. This resulted in the whole party—the Messrs. Bassano, 'Hawkshaw,' and a policeman—marching into a dark room. Mr. Fred Bassano's camera was opened first, and 'Hawkshaw' was at length convinced that it was a camera. The case, however, assumed a serious aspect when it came to an examination of Mr. Chas. Bassano's camera, for 'Hawkshaw' came upon a loose spiral spring which holds the films down. 'Ha!' he exclaimed, 'this is quite different! Now we have got something important.' It cost the photographer, to whom the dark room belonged, a lot of trouble to convince the old gentleman that this camera was not some lethal engine for killing fish. When he had accomplished this feat the photographer wanted payment for his time and the use of his room, 'Hawkshaw' at once declared that the Messrs. Bassano must do that, and in this exposition of the law he was backed up by the policeman. Now the talk of the group of fishermen on the quay turns on the big law case that may go to 'coorts in Lunnon' and which will settle the great question, 'Who pays the photographer?'"

It may be of interest to note that the little boxes which the inquisitive old gentleman appeared to regard either as receptacles for fish or as secretly worked machines for luring the inhabitants of the deep from their aqueous homes, were "Tella" cameras. Mr. Charles Bassano thus writes to the Company: "Yes, the cameras which caused the Barmouth adventures were Tellas, and you can make any use of that fact you like. Wasn't it funny? I am pleased with the working of mine, it has never failed once, and I have some good negatives. Better advertise that the Tella is good for photographing, but does not catch fish."



THE Tella Camera Company Limited, of 110, Shaftesbury-avenue, W.C., ask us to notify secretaries of photographic societies that they are ready to fill up dates for lectures and demonstrations on their Tella camera by Mr. W. E. Dunmore, a Director of the Company.

\* \* \*

THE prospectus of Secco Films (British and Colonial), Limited, has been issued. The capital is 100,000%, of which 66,667 are offered for subscription, 20,000 of the issue being appropriated to provide working capital, the balance of the nominal capital being allotted to the vendors in part payment of the purchase price. The directors are Sir R. T. Goldsworthy, Major Patton-Bethune, Mr. O. Treherne, Mr. T. C. Hepworth, and Mr. P. E. Butler.

\* \* \*

To the technical properties of Secco films we made full reference in our issue of July 7 last. Reproductions of negatives obtained on the film accompany the prospectus, and there are included the opinions of many eminent British and Continental photographers upon its capabilities. As we have over and over again pointed out, there is a large and growing demand for flexible films amongst amateur photographers and others, so that the Secco Company could hardly appear at a more appropriate time. At the press demonstration of the film a few weeks ago we subjected it to severe trial, and found it work with exceeding ease and facility. In this respect we are convinced that its chances of success are undeniable.

#### PHOTOGRAPHING MACHINERY.

THE needs of engineers and other manufacturers of photographs of their products have produced, in large towns where there is work enough for him, a specialist in this particular line—the “technical” or “engineers’” photographer; but in small manufacturing centres work of this description must naturally go to the local professional, or perhaps we ought to say that it would go to him if he could always be depended upon to turn out what the manufacturer wants. It is easy enough to set up the camera in front of an engine or machine and to get what the photographer himself may consider a satisfactory negative—an opinion which may not be shared by the customer when he gets the proof. It is wise to bear in mind that a photograph of this kind is a record pure and simple, for preservation by the firm or for despatch to customers as a guide to the merits of the machine; hence every effort should be made to render the photograph a full and accurate delineation of the subject, and we may therefore be excused for letting fall a few hints in regard to points in the work which may not perhaps suggest themselves to the portraitist.

Most machines in course of painting have a coat of “grey filling” given to them, prior to the application of the final colour and its subsequent varnish. If possible, arrangements should be made to take the photograph at this stage; the matt surface gives no trouble from reflection, whereas the finished machine often reproduces with a most objectionable lot of markings, due to reflection of surrounding objects from the varnished surface. If it is not practicable to make this arrangement, some improvement may be effected, provided the course is not objected to, by dabbing the bright painted

parts with putty. At any rate the bright steel parts should be painted with a mixture made by adding enough white lead to turpentine to make a thin cream, adding lampblack to deepen the colour as much as may be desired, and then adding one sixth its bulk of gold size to the mixture. This can be easily removed afterwards with a rag dipped in turpentine.

The lighting of machines in shops or engines in the open yard has generally to be made the best of by what means the photographer himself can devise, since it is rarely convenient to take the photograph anywhere but in one particular spot. The defect most frequently met with, both indoors and out, is too much top light, the result of which is to produce heavy shadows which obscure the details in these parts. It is therefore necessary to illuminate these shadows by artificial means. Reflecting screens—a white sheet, or, better, tinfoil attached to wood or cardboard—can be used. Sawdust, or white sand, strewn on the ground round the base of the machine, is by no means a bad substitute for these; or a line of flash powder, placed as close to the subject as is consistent with its exclusion from the field of the lens, can often be used with advantage. Any flash powder answers; we have found a home-made mixture of equal weights of magnesium powder and potassium permanganate quite satisfactory; care should be exercised, too, in placing the camera; a lower point of sight than usual frequently allows details to be seen which would otherwise be missed.

In the matter of backgrounds, an absolutely white background, if it can be so called, produced by painting round the machine on the negative with opaque pigment, is preferred by many. This entails a considerable labour when, as is often the case, small details, such as handles, steam cocks, project from the profile of the machine. Blocking out is done in the usual way, using a “duck” sable hair well charged with opaque colour. If electric light is available, an incandescent lamp placed beneath the negative is the *beau-idéal* of an illuminant for fine work of this kind; otherwise the usual reflector of the retouching desk or a mirror in its place.

It is well to avoid handling the film with greasy fingers before blocking out, for the blocking colour refuses to “take” easily to the parts affected in this way.

Sometimes the availability of a sheet or canvas, which can be rigged up on a temporary frame as a background, does away with the necessity of blocking out. Should this be defaced by dirt or holes, which is very likely to be the case if it is unearthed from somewhere on the premises for the use of the photographer, the reproduction of any markings in the negative can be prevented by enlisting the services of a couple of labourers to keep it gently moving during exposure.

Some object should be included to give an idea of the size of the machine—in the case of a large machine, a man, who, by the bye, should look at the machine, and not at the camera; in the case of a small, a six-foot rule, boldly graduated into feet.

Development, after ample exposure, is not difficult, and the photographer cannot go wrong in using, to commence, a developer made up as for portraiture, that is, weak in pyro. When all detail is out, a further quantity of pyro may be added to secure a vigorous image.

To those who have done work of this kind these few notes will, doubtless, appear superfluous, but to many photographers, whose work is confined pretty well to the studio, they will, it is hoped, prove helpful, and assist them to follow up a by-path of



business which allows a larger margin of profit than much of present-day portraiture.

We may add that, when the photographs are required for the illustration of catalogues, the photographer should, if possible, undertake the supply of the process blocks not only on the score of the profit on the transaction but that he may exercise some oversight in the matter of the photographs being well reproduced.

**Stereoscopic Illustrations.**—It has been stated so often during the last decade that stereoscopic photography was going to boom, though, so far, the results have not justified the prediction, that it is scarcely safe to prophesy; but at the same time we are bound to say that at the present time there is a strong under-current of feeling that at last the stereoscope is really going to have an innings. A straw is said to show which way the wind blows, and the latest wind indicator regarding this subject comes in a form which has great promise. Messrs. Pearson's, Ltd., have recently published *Impressions of America*, by T. C. Porter, M.A., F.C.S., &c., which is illustrated by diagrams and stereoscopic views. Referring to this work, *Nature* says: "The great merit and unique character of the work depends, however, not upon the author's impressions or his theories, but on the incomparable series of photographs which he took. These are reproduced in the form of stereoscopic views, and a neat little lenticular stereoscope is supplied with the volume. . . . They are reproduced by the half-tone process as separate plates, and very well printed." Now, it is quite evident that, if only a few more books were printed under similar conditions, the reintroduction of the stereoscope and its charming effects is simply a matter of time.

WITH regard to the use of process prints for the purpose, there will need to be great care exercised in obtaining clean blocks, and in making use of as fine a grain as possible. Without having made an actual trial, we should be inclined to predict that, with any but a very fine screen, the grain so familiar in process prints will become very offensive in the stereoscope, in a degree far in excess of the mere magnification induced by the use of a lens for viewing with. The effect in the stereoscope of the merging of the two prints in one is entirely marred if there be any unevenness of texture. This texture is not merely magnified, but, by a curious optical phenomenon, the irregularities present themselves to the eye apparently in different planes. This effect is seen in perhaps the most striking manner by the following experiment: Give a typesetter a small paragraph to set up twice over, spacing and justifying in as nearly similar a manner in each as he possibly can. Then let the two paragraphs be mounted stereoscopically, and view in the stereoscope. No matter how painstaking the compositor may have been, the letters will appear in the instrument at various levels, instead of coalescing and on to one plane, as might have been imagined would be the case.

**Ancient Inventions Revived.**—During the past week the daily papers have been describing, at some length, a system by which fountains at the Crystal Palace are to be illuminated next week. This consists of illuminating the water, as it leaves the jet, by a strong electric light; and elaborate descriptions are given as to how it will be done, &c. As a matter of fact, water illuminated in this way seems to absorb the light and carries it with it into the air. All the accounts we have seen of what is to be done have treated it as a new and novel idea. That is not so, however, for it is as old as the proverbial hills. As far back as the fifties, at the Panopticon of Science in Leicester-square—now the Alhambra—while under the management of Mr. F. H. Wenham, if we mistake not, the illuminated fountain was made a feature of for a long time. It was a single jet of water, of large size, illuminated at the jet by means of a powerful electric light, and projected up to the dome of the building; there it was still further illumined with another powerful

electric light. During the display, various colours were introduced at the source of light, and the thing proved a great attraction. Directly afterwards, the Royal Polytechnic Institution, then a place of scientific entertainment, followed suit with an "illuminated cascade" where, again, the water was illuminated at the point of its issue by the electric light. Verily, "there is nothing new under the sun" even in public entertainments.

**Purifying Acetylene.**—This is a subject of ever-present interest, for it is well known that the impurities accompanying the gas as disengaged from the carbide have often been the *finis et origo mali* in the accidents that have occurred in its use. Sulphuretted hydrogen is offensive, phosphoretted hydrogen is dangerous; both are liable to be present. According to some recent experiments by Herr P. Wolf the percentage proportion of these gases in the acetylene evolved from American and Swiss carbide respectively have been '02 and '04 in the former, and '02 and *nil* in the latter, while some carbide of the most recent manufacture is still purer. The sulphuretted hydrogen is diminished in quantity by having a large excess of water in the generator. Frank's method of purification consists in using acid solutions of certain salts, particularly chloride of copper. There is some waste of acetylene by a portion being converted into aldehyde. Herr Wolf proposes to use chloride of lime containing a small proportion of an alkaline chromate, the acetylene undergoing no absorption. Frank states that the solution he uses can be placed in an enamelled vessel, and that a single litre of it is capable of purifying fourteen cubic metres of acetylene, and that even this small amount of liquid need not be wasted, as it can be again utilised by boiling and subsequent aeration.

**Liquid Air.**—This wonderful agent is now an ordinary commercial product, and it is quite possible that its introduction may enable it to be applied in some branches of photography. A Mr. Brady, of Chicago, is stated to have designed and patented a cask in which liquid air may be stored. A company is at work in New York making the liquid, and the possible output appears to be very considerable. We read that, when the apparatus was in full work, the liquid air issued from the discharge pipe at a rate which indicated one gallon per minute as of easy production.

**Old Processes Rediscovered.**—A fortnight ago it will be remembered that we emphasised a suggestion, made in the *American Journal of Photography*, that it would be interesting, and perhaps useful, to experiment with some of the obsolete processes with the light of modern knowledge—a suggestion, by the way, that we have often thrown out before. In a translation of an article in the *Photographische Correspondenz*, by Professor E. Valenta, given in our last issue, on "Printing with Bichloride of Mercury and Citrate of Iron and Ammonia," the Professor treats paper with bichloride of mercury, ammonio-citrate of iron, and citric acid. The process, as given, is interesting, and it is very like an old friend in a new garb. If we turn to p. 57 of Hunt's *Manual*, fourth edition, published in 1854, we find a section devoted to the photographic properties of mercury, in which the writer says: "But, if the mercurial salt be subjected to the action of light in contact with the ammonio-citrate or tartrates of iron, the effect is far more powerful . . . is endowed with considerable sensibility, and darkens to a very deep brown, nay, to complete blackness, on a moderate exposure to a good sun." The method of Hunt was somewhat different in detail from that of Valenta. The former used the mercurial proto-nitrate, and the latter the bichloride. Hunt's difficulty was in the fixing the image. However, Valenta's process serves to confirm what we have frequently said before, that it will be well to unearth and overhaul some of the earlier and forgotten processes—unknown to the majority of modern photographers—with our present knowledge of photo-chemistry. Some of them have already been turned, with but little modification, to practical account.



**The Vandyk Tercentenary.**—English photographic tourists in Belgium will do well to bear in mind the Vandyk tercentenary, which will be inaugurated on the 15th inst. The opening of the Exhibition will be preceded by a street procession, as in the case of the Rubens celebration of 1877, in which, in the civic *cortège*, some of the most famous canvases of the great master will be displayed. Here will be novel food for the tourists' hand cameras. There is also to be a religious service in the famous Cathedral. The pictures, 106 in number, are drawn from all parts of Europe. Belgium, the country of Vandyk's birth, contributes thirty-one of his works, while England contributes thirty-seven. This is not altogether surprising, seeing that the great master spent the greater portion of his life, and did the greater part of his work, in this country. We learn that the collection, while on view, is insured for 400,000*l.* This seems a somewhat small sum when it is considered the large prices some of the great artist's work has realised here at times within the last few years, and that the Exhibition will include some of his best pictures. Be that as it may, snap-shots of a civic procession, with several famous pictures, to celebrate an artist's tercentenary, will form interesting food for the camera.

WHILE on the subject of picture exhibitions, it may be mentioned that, at the meeting of the Court of Common Council last week, it was decided that the Loan Exhibition at the Guildhall next year should be of representative works by living artists of the British school. There was some opposition on the part of the Library Committee to having any show at all next summer, on the ground that the time was too short to get together a representative exhibition, but this was overruled by the Council. Most people will be glad to hear it, as it would be a pity if these annual exhibitions of some of the best pictures in the country were made only bi-annual instead of annual.

**Ben Nevis Observatory to be Closed.**—This Observatory will have to be closed in October next unless funds are forthcoming to keep it open. Anent this subject a question was put in the House of Commons, one day last week, by Mr. Buchanan, as to whether the Government had declined the sanction of a grant of 1000*l.* to enable the Observatory, the only high level one in this country, to be carried on for a further period of two years. In reply, Mr. Hanbury said the facts were not quite as implied in the question. The Government make a grant to the Meteorological Council of 15,300*l.* a year. They have abstained from expressing any opinion what proportion of that grant should be assigned to the Ben Nevis Observatory, that being a question for the Meteorological Council. In reply to a further question as to whether the hon. gentleman, on behalf of the Government, could induce the Meteorological Council to give a sum for the support of the Observatory, Mr. Hanbury said that we have already tried to do this, and apparently they do not think they ought to give it. One would have thought that the Council could, out of the grant, have afforded to give the paltry sum of 500*l.* a year to keep the only high level Observatory we have going for a couple of years more, particularly if it would aid in more correct weather-forecasting. Even approximately correct weather forecasts would be a great value to agriculturists at certain seasons, and at all seasons to photographers. At present the daily forecasts, as issued from the Meteorological Office, are little better than a farce. They are fairly correct in settled weather, such as we have been having of late, when we can do our own forecasting. It is in an unsettled state of the weather that we want to know more.

#### IRREGULAR-GRAIN PROCESS BLOCKS.

WHILST quite open to be convinced of the advantages, if not the superiority, of irregular-grain screens compared with the ruled screen, I have not yet seen any results which would stimulate me to enthusiasm. I would certainly welcome an irregular-grain process, by screen or otherwise, which would give a result as satisfactory for all classes of subjects as the ruled screen; but, so far, all specimens I have seen are apparently picked subjects. If I were to select half a dozen photographs and send them to some firm working irregular grain, I should most likely have

them all returned as "unsuitable for the process." This sort of thing rather shakes one's faith in irregular grain, especially when one recalls the fact that nearly every notable experimenter in "process," from Fox Talbot downwards, has tried to reproduce photographic tones in irregular grain for letterpress relief blocks, and yet no process has survived the ordeal of commercial application.

Nevertheless, irregular grain is a fascinating subject, and I have been smitten several times with a desire to follow it up, and have given it a trial in several ways, with disappointing results. This may be my fault, but, when I find so many others equally disappointed, I am led to the conclusion that there must be something wrong in principle.

The conclusion I come to is that there is a very essential difference between using a ruled screen and an irregular-grained screen. The former builds up its own image, reproducing the picture in another form, viz., as a mosaic of dots. In a sense it is not a screen, because its function is not to hide some parts of the plate and let others be operated upon. Nor must we regard it as something which scores the sensitive plate across with a lot of ruled lines which slice up the image into little squares. The proper light in which we must look at the action of the ruled screen is to consider every opening of its network separately, each having its own function to perform of taking in—actually photographing—a tiny section of the picture. I do not mean to say that in the space of each single dot there is some detail or gradation of the picture, like the sections of children's block puzzles, which, when all properly fitted together, form the picture, but that each opening of the screen is influenced by the amount of light that reaches it and forms a dot which is the optical equivalent of the tone of the picture at the point corresponding to the position of this dot on the plate. If the tone is dark, it will be a small dot; if it is a middle tone, it will be a middling-sized dot; whilst, if it corresponds to a high light, it will be a big strong dot, the negative of a very fine dot in the subsequent half-tone block. Thus the picture is built up simply of three or four sizes of dots, which have individually no more analogy to the form of the picture than the bricks of a house wall or the tesserae of a mosaic pavement have to the complete architectural design. The photographic lens is the optical bricklayer or paviour, forming out of heterogeneous elements a homogeneous structure.

If my theory is correct, I can assume that, were I to take a photographic print and rule it with lines like squared paper, I could render upon it an approximation of the photograph by blackening in alternate squares to correspond to the tones, filling the squares full for shadows, making round dots just to fill the squares for half-tones, and just dotting the centre of the square for high lights. If I bleach away the photograph, leaving only the dots standing on white paper, there should be a fair representation of the photograph, the illusion being more perfect the further the print is held away from the eye. If examined with a bi-concave lens, otherwise known as a diminishing glass, to reduce the dots to the fineness of a half-tone, the photographic effect will be very realistic.

In the *Process Year Book* for 1898, I carried out the same idea in a much neater way by having three type characters cast to represent half-tone dots, and gave the printer a copy prepared in the way indicated above, and he set up the type characters so as to form a mosaic of the picture in squares of  $\frac{1}{16}$  inch. A proof was taken from the "forms" and reduced by photography until the squares were about  $\frac{1}{160}$  inch. The result was then exactly equivalent to a half-tone of the same size made from the original photograph with a 100-line screen.

It is thus obvious that the half-tone reproduction with the ruled screen is nothing more than a collocation of dots, and the finer and more varied these dots are in size the more perfect will be the original. With 12 dots to the linear inch the result is dreadfully crude, with 120 it becomes quite passable, with 1200 (assuming it was possible to get that number) the result would be equal to the most delicate photograph. Again, with only three sizes of dots the result is coarse, with six sizes it would be better, whilst with an infinite variety of sizes, ranging from the needle-point dot to the maximum of the screen spacing, the ideal effect would be obtained. This is the whole theory of tone-rendering in opaque ink. How the dots are formed of varying size is another theory which I need not, for my present purpose, enter into here.

Now mark how different is the action of an irregular-grain screen. It has to be placed quite close to the plate to be of any use, and its function is purely that of a screen in the exact sense of the word. It screens those portions of the plate under the grain points; that is to say, it abstracts a certain part of the picture, so that in the proof from the resulting block the eye has to imagine the rest. It may be urged that this is exactly what the proof from the half-tone block conveys, the eye in this case also having to "imagine the rest." But there is a distinct



difference. The ruled screen, as I have shown, builds up a picture, whilst the irregular-grain screen hides, or takes away, something from it, leaving still sufficient to give the eye the impression of the original.

It may be asked, How is it, if this hypothesis be correct, that a certain selective action takes place in making a negative through a grained screen? When the negative comes to be printed, there is certainly fine open grain in the high lights, and coarse, close-lying grain in the shadows. The explanation of this fact is that lateral spreading takes place around the grain in the high lights, and probably this is aided by irradiation within the film. Even if we deposit bituminous powder in a fine shower on the surface of the dry plate, so as to form a grain which sticks closely to the film, we still get this spreading action. The result is to give a sort of spongelike texture to the negative, and, when this negative is printed, the positive result consists of fine isolated dots. In the deepest shadows there is practically no action; there is no contrast between shadow and grain, and therefore the grain has no effect, the part around the grain remaining as transparent as the part under the grain. In the half-tones there is a medium action, the spongelike texture being practically of the same degree of fineness, or coarseness, as the grain, because there is little spreading. On the whole, I think I am justified in saying there is no selective action exercised by an irregular-grain screen, it is merely screening. The picture is robbed of much of its brilliancy, because the screen has taken away something from the fulness of the half-tones; it has added a grain to the high lights and so degraded them, whilst it has taken little or nothing from the shadows. The result must necessarily be a false rendering to the original.

The case is not at all the same in the half-tone process with ruled screens. It is true that we cover the high lights with dots, and that the half-tones are reduced in tone, but these two faults are, to some extent, compensated in the best work by "greying" the shadows, so that the key of the picture is lowered as a whole. The dot effect which covers the high lights is, moreover, not strongly in evidence. If the dots are uniform and very fine, they simulate whiteness very well, only reduced in luminosity. The irregular grain, however, gives a dirty, degraded effect to the high lights, besides causing a falling off in intensity. The irregular grain, for instance, always looks harsh and unpleasing on the face in a portrait.

This brings us to the consideration of the class of subjects which may suit irregular grain. Generally speaking, smooth-surfaced effects do not yield pleasing results in irregular grain. Flesh tones, light, smooth drapery, polished surfaces, delicate skies, smooth water, detail with sharp outlines, are all unsuitable subjects, and are, in fact, just what one would expect to be unlikely for the purpose. Rugged or thickly foliaged landscapes, portraits of rough-bearded men, photographs of rough-haired animals, crayon or pencil drawings, are much more manageable subjects.

If, then, we are to select only such subjects as are suitable for irregular grain, it is hardly likely that it can ever be useful to such a widespread extent as half-tone with ruled screens. No half-tone man would think of refusing a copy as unsuitable; he will in all cases endeavour to make the best of it, and, as a result, we see the process used for every conceivable class of subjects. It is a universal process of reproduction, copying faithfully works of art, portraits, landscapes, seascapes, commercial objects, drawings, and, in fact, everything that can come within the range of the camera. And what is there to-day which will not yield an image to this all-pervading instrument, which sweeps the heavens, probes the depths of the waters, reveals the cavernous workings of man or nature under the earth, catches images of bullets and projectiles surging through the air, shows us birds when swiftly winging their flight, or calmly reposing in some inaccessible eyrie; everywhere, in fact, reading for us, or helping us to read, the riddles which a sphinx-like nature sets us poor mortals to worry our brains with?

The camera and the half-tone process seem more than ever destined to go hand in hand, the one taking the pictures, the other reproducing them, and, by the aid of the printing press, disseminating the same for the instruction or amusement of the million. The kindred processes of photography and photo-engraving have fulfilled a want of the age, and to that fact is owing their wonderful progress. The half-tone process has especially got a strong hold on the picture-loving public. The majority may not know exactly what it is, but they recognise that it is a method by which they get faithful representations of men and things. They have become used to the "screeny effect," which, indeed, is now so subdued in the best blocks that it passes unnoticed.

Now, is "irregular grain" going to have the same success, the same

widespread application? Is it going to be as universally pleasing to the public? I think not. It may please a few enthusiasts, but, after all, the great thing nowadays is to please the crowd if you would be successful from a pecuniary point of view.

WILLIAM GAMBLE.

## FOREIGN NEWS AND NOTES.

**Woven Photographs.**—In Dr. Liesegang's paper, *Der Amateur Photograph*, we read that one of the wonders of the approaching Paris Exhibition will be an automatic machine for taking photographs and reproducing them in woven material. The person wishing to be photographed will stand in front of a machine, place a coin in the slot, and pose until a signal from a bell indicates that the photograph has been taken. In fifteen minutes from that time the machine will deliver to the sitter a pocket-handkerchief with his photograph woven in the fabric. The process by which this result is obtained is only partially known at present, but it seems that the photographic image is formed of dots, and used for the production of a perforated image on a metal band. By means of these perforations the warp is raised in the loom and the wool forms a dot in the fabric. The assemblage of dots, by their relative position, forms the image. The wonderful part of the process is the rapid transformation of the dots forming the photograph into perforations upon a metal band, and, if this has been successfully accomplished, it constitutes an advance that may have considerable influence upon textile manufactures.

**The Latent Image.**—Dr. V. Schumann communicates to the *Archiv für Wissenschaftliche Photographie* a very interesting fact which he has observed. If a glass plate is coated with a very thin film of gelatino-bromide of silver, this covering will withstand the action of the strongest acids. Such a plate may be immersed in nitric acid (40°B), either before development or after fixation, without injury to the film, and neither the capacity for development nor entire destruction of the image takes place. These facts should prove that the latent image does not consist of metallic silver, and that the image after fixing is but partially formed of silver. It has been stated that an emulsion of AgBr, in contact with pure metallic silver, may be reduced to silver by development. Dr. Schumann has not found this to be the case with the ultra-violet plates which he prepares. If any reduction occurs, it is due to friction, pressure, or other mechanical means. He has not made similar experiments with ordinary plates, but has been assured, by those who have, that simple contact is insufficient to bring about reduction by a developing solution.

**Ammonium Persulphate and Halation.**—Dr. Meydenbauer mentioned, at one of the Berlin photographic societies, that he was induced, by the highly favourable reports concerning this reducer, to try the effect of it upon some old negatives of interiors, which he had found too bad to print, on account of the halation surrounding the windows. The result was highly satisfactory, the density of the windows being sufficiently reduced to permit of good prints, showing full detail in the windows, being made. A two per cent. solution, slightly acidified with sulphuric acid, appears to have been used.

**Testing Coloured Screens.**—Following the lines suggested by M. A. Villain, in the *Moniteur de la Photographie*, a contributor to the *Photographische Chronik* describes the following simple method for extemporising a colourimeter. Remove the lens from the camera, and for the focussing screen substitute a small board of suitable thickness. Cut two round or square holes, side by side, in the board, behind which two glass tubes of identical diameter and thickness should be affixed by wire or other suitable means. 15 mm. diameter and 15 cm. length are convenient dimensions for the tubes. If samples of the two solutions to be compared are poured into the tubes, very slight differences in colour may be detected upon looking at them through the lens flange. If necessary, light may be reflected upon the tubes by a looking-glass placed at a suitable angle. It is desirable to exclude all extraneous light by using a focussing cloth.

**Hand-camera Lens Adjustment.**—A patent has been granted in Germany to A. Theopold for a means of adjusting the elevation of the lens. A plumb indicator is affixed to the side of



the camera with a scale showing the angle of elevation or declination. A corresponding scale is marked on the rising front of the camera. The object to be photographed is centered on the finder, the angle read off on the scale of the plumb indicator, and the lens raised or depressed to the corresponding point on the scale of the rising front. The photograph should then be taken with the camera held level.

**Gum-bichromate Portraiture.**—The *Deutsche Photographen Zeitung* contains a very interesting letter from a Vienna correspondent, in which the method is described by which Herr Otto Schmidt, a professional photographer, has produced some very fine life-size portraits. The Vienna Photographic Association has recently awarded him the silver medal for the excellence of his work in this direction. Herr Schmidt, before turning to photography as a profession, was a water-colour artist of repute, and, doubtless, this accounts for the success he has achieved with that most plastic of photographic processes, the gum-bichromate. His pictures are the result of two, three, or four printings from the same negative. Landscapes are, of course, less difficult than portraits. Whatman's Imperial drawing-paper is sized with gelatine and chrome alum and covered with a very thin coat of gum-bichromate containing very little pigment. A soft negative is used and the highest lights are protected. The first printing gives an image very delicate in the half-tones. For the second printing rather more colour is used, and a harder result is aimed at by various means, such as the use of a screen of green glass, &c. The third printing is still harder in character, and in this manner the print is gradually built up from the most delicate half-tones to the deepest shadows. It will be readily understood that, by successive printings with pigments of suitable shade and intensity, the gum-bichromate process may be made to yield pictures with a great range of tone. In the hands of a competent artist the process should be capable of yielding portraits of exceptional merit.

## FLORAL PHOTOGRAPHY.

### II.

Next in importance to the providing of a suitable background comes that of, at least, some knowledge of how best to dress and stage many of the subjects that make excellent studies in floral photography. The dressing of, say, such a subject as a pot plant, so as to render it in the most suitable condition for being photographed, is an operation which too seldom receives attention by those who do not possess some knowledge of horticulture. By dressing is meant the alteration of the shape or contour of the foliage, as well as in some instances the pruning of certain portions that detract from the shape, and which produce eyesores in a greater or less degree; also that of not infrequently going so far as to add even additional blooms by cutting them from an entirely different plant of an exactly same species, and adding those cut blooms, in an extremely natural form, to any portion of the plant where the blooms are deficient. This treatment is largely practised by professional gardeners, and, as I write, I can recall a notable case that came under my observation some time ago, when I was commissioned to execute a number of photographs for the Curator of one of our large botanical gardens. The plant in question was considered a rare specimen of its kind; but the blooms, although exceedingly fine, were not distributed as equally over the plant as the Curator desired; so, on my proceeding to unlimber the photographic apparatus, a slight consultation was held among the gardeners, the result of which was soon seen in the production of another specimen of the same plant, and, having selected the best blooms on them, they were removed together with the entire branch bearing them, and a few minutes saw the plant that I was to photograph bearing these borrowed plumes, which any one outside the ken could never have detected as not belonging to the plant as depicted. I remember this mode of dressing a plant was a revelation to me at the time, but I have since learned that among professional gardeners it is quite a common proceeding where plants have reached a certain stage and it is desired to photograph as well as at times to exhibit them.

Any one whose horticultural experience is not great should endeavour to be present at the preparations of blooms and plants about to be displayed at a flower show. Here may be seen the professional dresser in all his glory, with ivory blade, knife, and tweezers, and certainly the watching of an expert dresser is a lesson to any one intending to photograph floral studies, which must prove highly instructive. Mark, for instance, the delicacy of touch with which he will handle, say, a number of prize blooms of exhibition roses; here the outer petals will be most beautifully curled and opened backwards by means of an ivory-bladed knife, and a few seconds of time will suffice to work quite a complete transformation in the appearance of the delightful flowers he has manipulated; and, the most marvellous thing of all, without injuring the

natural peachlike bloom of the petals. This preparation of blooms for the purpose of exhibition amounts to a fine art, if not, indeed, bordering upon the display of genius, and tends, in a marked degree, to the production of good photographic studies, simply by reason that plants are displayed with their blossoms equally distributed, even although many of them are, in point of fact, not borne by the plant itself, and but very few cases will be found where a plant in itself is not improved in appearance by such treatment. If the dressing of such subjects as pot plants becomes a question of importance, so does that of staging, especially from a photographic point of view, and in the staging operation we have a field which covers a very wide area, for almost every bloom requires a different treatment. Take, for instance, the staging of a spray of violas—without doubt one of the most charming exhibits to be met with in our autumn shows, and which lend themselves especially to photography. Every one knows that violas are more or less a delicate species of bloom, and unless they be very carefully handled and protected, their beauty will soon disappear; yet these fragile blossoms, when carefully staged, may be made to retain their almost pristine beauty for two or three days. A clever dresser well knows how to retain, not only the freshness of the blooms, but likewise how to maintain their shape for almost an indefinite period. In his treatment, he will very probably bring to his aid damp moss, knitting cotton, and very fine wire, and when to the blossoms is added the foliage of the violas, and they are relieved on a background of black or other suitable coloured velvet, the effect is charming.

From a photographic point of view much will depend on the selection of the most suitable varieties, especially in regard to colour, and the placing of these sprays of blossom in at least a somewhat natural position.

One of the best pictures of violas I ever witnessed was obtained by staging the sprays on a sheet of glass behind which was the velvet that was used as a background, at a distance sufficient to throw the pile out of focus; and the sprays were made to occupy a position so that the camera was pointed somewhat downwards when the plate was exposed. By making provision whereby an intermediate transparent screen of glass is caused to hold a subject *in situ*, so that a background is made to appear a fair distance behind, a delightful feeling of space is introduced, and the blooms do not give the appearance of being pasted or stuck upon the background like a postage stamp to an envelope.

In a previous article reference was made to the necessity of providing facilities for using the camera in a somewhat vertical position. A very little consideration will be needed for any one to understand that, as nearly every flower differs in form, some being somewhat rounded like the African marigold and dahlia whose crowns may be said to be their glory, others, on the contrary, are found assuming a somewhat flat surface with a drooping tendency, such as the single dahlia and pansy, and, were any one to attempt to photograph each of these subjects under exactly similar conditions of lighting and posing, the result would not be satisfactory, for in the one case the side only of the bloom would be depicted and a very false rendering of form be given; therefore hardly any two subjects will be found to suit the same method of lighting and posing.

In lighting we have a very important factor in the work we are considering, and, although much may be done in close proximity to an ordinary window, there is no doubt that the great bulk of subjects will be found best treated in the open air or in such a retired place outside as where a plant is capable of being lighted with a somewhat strong side and top direction of main light, a position often found in close proximity to a gable or high wall where one side of the light is shielded.

If the work is attempted indoors other than in studios, especial attention must be given to reflectors, and it is a mistake to suppose that white reflectors are the best to employ, for experience has shown the writer that, in dealing with coloured objects such as flowers, coloured reflectors are by far the best; but these will be found to depend very much upon the colour of the object being photographed, and any one having no experience of this work and who employs, say, a strong white reflector may even be surprised to find that on some subjects quite an effect of cross lighting will be produced by using it, whereas the employment of a pink reflector on subjects of a white colour yields a delightful softness and transparency in the shadow, far in advance of the results achieved by using the universal white fabric.

In this work a beginner will not be long in finding out that long-extension cameras are a necessity if anything like size of objects is desired, and long-focus lenses are a *sine-quâ-non*. Working at close quarters with them means heavy stopping down, and very long exposures frequently have to be given. In my belief there is no fixed rule to follow as to the employment of any special plate. Isochromatic plates and screens will be frequently required, but ordinary bromide plates are by no means outclassed by the former. So much will be found to depend upon the lighting and the colour of the object, as well as the requirements for which the object is being photographed; if, for example, half-tone blocks are to be made from the photograph, it by no means follows that isochromatic plates and coloured screens are the best to use, for in such work as book illustrations ordinary bromide plates will frequently yield a far better range of values which by the touching up by hand invariably produce better pictures for being photographed through a grating.

Some studies such as are in nature viewed by looking down upon, as in



the case of ferns, are best photographed in some position where a natural background can be used, and many delightful hedge-row studies have been acquired just as they appear in nature, but these are very difficult to obtain by reason of movements from the slightest breath of wind.

It must not, however, be supposed that with the production of a good negative this work is completed, for, no matter how good a negative may have been obtained, much may be done to improve the printing values of same by after-manipulation.

This may mean the strengthening of high lights and the reductions of same where they are too intense, in fact there is almost no limit to the working up of negatives of this class in which the application of transparent oil pigments in addition to the ordinary use of the lead pencil will be found almost invaluable. One thing, however, is certain, that in floral photography a very pleasant branch of work is open to all who care to expend a little extra cost in apparatus and take a delight in contemplating the wonders of nature as displayed even in an ordinary flower garden, and once a beginning is made it is almost certain that the worker will find himself imperceptibly being drawn into a closer union with matters horticultural from which he will be able to dive down into almost unfathomable depths of nature's wonderful creation. T. N. ARMSTRONG.

## ON THE ACTION OF LIGHT ON THE SALTS OF COBALT.\*

### EXPERIMENTS WITH COBALDIC BENZOATE.

COBALDIC hydrate is practically insoluble in a boiling aqueous solution of benzoic acid. For photographic purposes it is therefore necessary to prepare this salt by double decomposition. For the present series of experiments it was formed by resensitising paper, previously coated with cobaltic oxalate and dried with a strong aqueous solution of potassium benzoate. A mixed bath of these reagents, it should be noted, is not, as might be supposed, available for these operations, from the circumstance that cobaltic benzoate, unlike the great majority of the salts of cobaltic oxide, is insoluble in water. The salt resembles the formate in its behaviour under the rays of the spectrum, but is somewhat more sensitive to light. A sheet of the prepared paper was exposed under a negative to diffused daylight. In the course of eighty hours a faint brown positive image was obtained. Another piece was exposed to the action of the spectrum for seventy hours. The image obtained is represented graphically in fig. 14. The red rays and the orange are equal in intensity, whilst the yellow and the green exercise a weaker influence, and the remaining rays are apparently without effect. On immersing the print in the ferricyanide developing bath the above image was gradually destroyed, nor was any new image formed by development. In both experiments during the exposure of the paper to light it was found to absorb moisture.

By the action of hydrochloric acid upon a mixture of benzoic acid and cobaltic hydrate, an emerald-green solution is obtained, paper coated with which, and dried, is about twice as sensitive to light as the simple benzoate.

The constitution of this green salt has not been accurately determined, but it would seem probable that a part at least of the benzoic acid is converted into chloro-benzoic acid, which, in turn, dissolves the hydrate, producing cobaltic chloro-benzoate. To prepare this solution, benzoic acid and cobaltic hydrate are boiled together for a few minutes in the presence of water; the bulk of the latter is then decanted off, together with the lighter portion of the insoluble matter, and a little strong hydro-

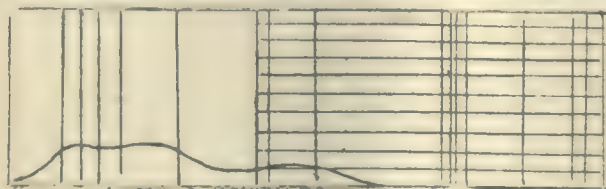


FIG. 14.—COBALDIC BENZOATE.

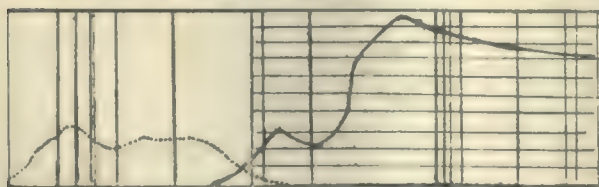


FIG. 15.—COBALDIC CHLOROBENZOATE (?).

chloric acid is added, when the residue will readily dissolve, the application of a gentle heat facilitating the operations.

An exposure of fully forty hours in diffused daylight is necessary in order to produce an image by "printing out" on paper sensitised with

the compound in question. The deposit so formed is of a brownish-yellow hue, with a shade of green in the high lights.

Under the spectroscopic, an exposure of forty hours' duration produced a distinct impression on the prepared paper, due to the less refrangible rays, and represented in approximate outline by the dotted curve in fig. 15. The resemblance to fig. 14 is very evident, the intensity due to the action of the red rays being, however, a little more marked. The print was transferred from the printing slide to the ferricyanide bath, whereupon the impression was speedily destroyed, a new image taking its place. This is represented graphically by the overlapping curve in fig. 15. The rays operative in the production of this second image are, it will be noticed, precisely those which failed to exercise an influence in the formation of image number one. The effect is attributable mainly to the blue, the indigo, and the violet rays, the maximum point lying in the first-named. The green rays exercise a comparatively weak action, equal, however, to the average intensity obtained in the initial stage. To practical photographers, silver printers in particular, this experiment may serve to throw some little light on causes as yet imperfectly understood relating to matters of printing and development, showing as it does that, under certain conditions, the latent or developable image is attributable to rays of quite a different order of refrangibility from those which are called into play in building up the direct or visible image.

### EXPERIMENTS WITH COBALDIC URATE.

This salt may be prepared by dissolving cobaltic hydrate in a hot saturated aqueous solution of uric acid. The presence of a small quantity of ammonium urate facilitates solution, a fact which is probably to be explained on the supposition that a double salt is produced. Paper was coated with the ammonio-cobaltic urate prepared as above, dried, and exposed to diffused daylight beneath a negative. In the course of about ninety hours a positive image of a pale brick-red colour was produced. A second sheet was exposed to sunlight in the spectrum slide for ninety hours. The resulting image was similar in hue to the first, and, though of no great vigour, yet served to exhibit faithfully the extent and character of the spectral action.

A glance at fig. 16, representing the spectrum band in question, shows that the urate is sensitive mainly to the blue rays, these producing the maximum effect. The indigo rays possess a medium degree of power,

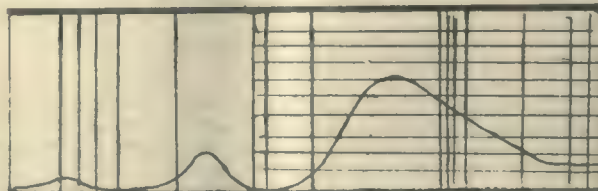


FIG. 16.—COBALDIC URATE.

the yellow an almost equal degree, the violet and the red a slight degree, and the green none whatever. The print, it should be added, failed to show any signs of a new image when soaked in the ferricyanide developer—in this respect resembling the benzoate.

### EXPERIMENTS WITH COBALDIC SILICATE.

For experimental purposes paper was sensitised with cobaltic oxalate, dried, and resensitised with a moderately strong solution of sodium silicate. The dried paper was found defective in keeping qualities, greyish patches and markings appearing on the surface in the course of a few days after its preparation. From the circumstance that a precipitate in all respects similar is formed when sodium silicate is added to the solution of a cobaltous salt, it is evident that the sensitising compound is gradually reduced to the cobaltous state without access of light. The presence of an excess of sodium silicate helps to delay this decomposition, but does not entirely arrest it. Instability of this kind is characteristic of a number of the cobaltic salts of the inorganic acids, though it is far from being either so common or so marked as some chemists have been led to suppose.

The cobaltic salts of the organic acids, on the contrary, are fairly stable bodies, and, except in those circumstances in which the conditions of experiment necessitate their exposure to light, seem to undergo but little change.

This paper was found to give a faint greenish-grey image under a negative in dull diffused daylight, thirty-five hours' printing being required. Under the spectrum an exposure of like duration produced a single faint band situated in the region of the indigo rays. When treated with the ferricyanide developer, no change ensued which could with certainty be attributed to luminiferous latent action. A second and a third strip of sensitised paper were successively exposed in the spectrum slide, the exposures given being respectively 95 and 110 hours in weak sunshine.

In neither case was there any appearance of the band in the indigo; but in place thereof a distinct broad band was produced in both under the yellow rays. Traces of a greenish-yellow deposit extending from the band towards the red end of the spectrum were observed in the first print.

\* Concluded from page 476, vol. xlv.



These, however, were absent in the second, having, no doubt, been destroyed by bleaching. The band in the yellow was also fainter, and, whereas formerly it possessed a greenish-yellow colour, now appeared of a pure yellow. Ferricyanide of potassium was found incapable of producing any alteration in the appearance of these prints beyond a gradual obliteration of the image already formed.

#### EXPERIMENTS WITH COBALTIC ALUMINATE.

A solution of potassium aluminate (prepared by adding gelatinous aluminium hydrate to a solution of caustic potash) was mixed in the proper proportions with one of cobaltic oxalate, and applied to paper by coating. A strip of this paper, after drying, was exposed in the spectrum slide for thirty hours, and gave a distinct but very faint yellow band under the red rays. A supplementary exposure of ten hours occasioned no change, nor did the application of the ferricyanide developer produce any extension of the image.

Another portion of the prepared paper was exposed for upwards of 100 hours in the slide, and examined at intervals. The yellow colouration was found to extend gradually in the direction of the green rays, and, having reached a little beyond the line *E*, it became stationary. At a certain stage of the exposure a bleaching action was set up. This increased hourly, so that at the close of the exposure the deposit was so faint as to be almost imperceptible.

An unsuccessful attempt was made to revive the image by development in a weak solution of argentic nitrate.

Whatever may be the exact nature of the decomposition effected by light in the case of the aluminate, it would at least seem, in the instances cited, that the salt was not reduced to cobaltous aluminate, otherwise a greyish-blue image ought to have been produced.

#### EXPERIMENTS WITH COBALTIC SULPHITE.

Paper was sensitised with mixed solutions of cobaltic citrate and sodium sulphite, a slight excess of the latter being present. After drying in darkness, a portion thereof was exposed to the action of the spectrum. No visible image having been impressed, the print was transferred to the ferricyanide bath. An excessively faint image of a purple hue was gradually deposited. The range of intensities could not be even approximately determined. Another strip, however, exposed for four hours in the same manner, failed to give any image when correspondingly treated.

A third and a fourth strip were successively exposed as before, but for a period of thirty hours each. One was then developed in the ferricyanide bath, and the other in an aqueous solution of mercurous nitrate. Neither exhibited the least appearance of an image. The addition of a few drops of dilute acetic acid to the ferricyanide bath occasioned no change that could be detected. A fifth strip, however, on being exposed to the action of the spectrum for sixty hours, though giving no image by "printing out," yielded a faint one when immersed in the ferricyanide developer. Fig. 17, representing the range of intensities obtained, will

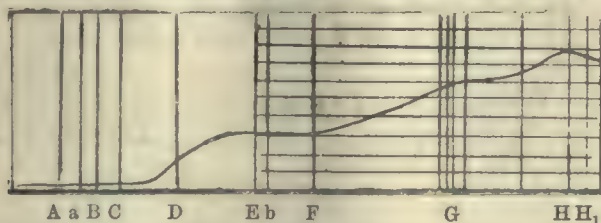


FIG. 17.—COBALTIC SULPHITE.

be found to present several interesting features. The rays of a low order of refrangibility, to which so many of the cobaltic salts are sensitive, are here shown to be inoperative with the exception of the yellow rays, which, however, exercise only a weak influence. From the *D* line there is a gradual increase in the activity of the radiations extending to the region of the violet, the point of maximum intensity being apparently situated in the vicinity of the end of the visible spectrum. These experiments tend to show that cobaltic sulphite is but little sensitive to light. Like the silicate, this salt is liable to undergo decomposition in darkness when the paper is kept too long. In a week's time discolouration occurs at the margins, and in the course of a couple of months the originally white surface assumes a uniform yellowish-pink hue.

#### COLOURING PHOTOGRAPHS.

M. CHARLES DICKER, of Brussels, the inventor of this process, points out that the methods hitherto known for preparing coloured photographs indirectly, that is, not in immediate connexion with the photographic process itself, comply very imperfectly with the requirements which in general apply to the details of a photographic picture. The methods, moreover, in effect depend mostly upon the skill of the person treating the picture, and consequently the pastels, water colours, and oil paintings so produced are essentially nothing but pictures in which the more or

less skilled hand of the artist reproduces the details of the photographic pictures in various degrees of perfection. It is true that by an ingenious combination of covering and glazing colours an improvement has been effected, inasmuch as the transparency of the latter enables the fine lights of the photographic picture to be more clearly recognised; on the other hand, these transparent colours have absolutely no effect on the half-tones and deeper shades of the picture, so that for the colouring for the latter only body colours can be employed. Experiments have shown that it is best for the elegance and good effect of the coloured photograph if only such colours be taken which, so to say, themselves penetrate in the separate pores of the picture, and possess both a great intensity and also the quality of being easily absorbed. The aniline colours possess these qualities, but the application thereof is limited, apart from the drawback that the colours also can only penetrate in the photograph to a certain degree of saturation, which does not suffice to colour the deepest shades. In the case of photographs especially which are taken upon albumen or Aristo paper, this especially applies, whilst collodion or celloidine papers only possess the quality of absorbing the colours in the moist condition. From this come very many practical difficulties; for instance, the colours once laid on can no longer be removed, and the pictures, if spoiled, lose their value; moreover, the latter-named papers cannot be wetted as often as desired in order to retain their property of absorption, but, if they have once become dry, they have lost their quality for ever, consequently the colouring can only take place immediately after the removal of the picture from the last water bath, and the work, in view of the damp condition of the paper and the tendency of the colours to run together, makes a good effect almost impossible. Added to this difficulty for treating photographs in the unmounted condition with colour, there is another drawback, namely, that the deeper shades cannot take up as much colour as will effectively suffice for them, so that the drawbacks of the present system are sufficiently obvious. On this account the operation has been somewhat changed, and the photographs have been treated with concentrated solutions of aniline at the back, which colour is intended to penetrate through the picture and appear on front; but this method gives such a weak, uncertain colouring that, even when the photographs are made transparent, no sufficient effect is obtained; moreover, the sensitiveness of aniline colours to light renders a treatment of this kind almost worthless.

The present invention has for its object a process which possesses great simplicity in comparison with the methods at present in use, and also shows such extremely satisfactory results as to distance any other methods and be applicable by any one without knowledge of painting and without any particular skill. This method is characterised by the treating of the finished mounted picture with a slight covering of a gelatinous material, and then subjecting it at the requisite parts to the action of an aniline colour. By this device is attained that the gelatinous layer takes up the colour readily, so that the pictures possess such a brilliance and light that even the deepest shades appear to be thoroughly saturated with colour and produce a very great effect. Of course, in the carrying out of this process, certain practical points must not be neglected, and, even when by the new process the colours are caused to penetrate into the deeper shades of the photograph, it is desirable in taking these that only plates sensitive to colour should be used, so that certain special colours, such as red, yellow, green, and blue, which in the use of ordinary dry plates give false colour values, shall, in correspondence with the transparent colours to be used, possess a greater or less covering in the negative and positive copies. It is well known that certain colours, such as red, yellow, and green, are reproduced in photographic pictures even darker than they are seen with the eye, whereas, even when the ordinary orthochromatic dry plates which are supplied by the trade to some extent remedy the above-mentioned contrast, yet the negatives and copies thereof produced by these plates with transparent colours do not give such clear and correct coloured tones as is desirable for this purpose; even the interposition of yellow glass, when colour-sensitive plates are being used, does not create the requisite balance, and experiments have shown that the photographing takes place best with the aid of red sensitised dry plates and a green light screen. In order, moreover, to obtain a satisfactory result in the colouring of the photographic representations, it is necessary that the same (three ground colours which are hitherto made use of) shall be employed in the taking, partly as screens, partly as sensitisers, so that when, for instance, for the colouring of the positive prints red, blue, and yellow are to be taken, also, at the taking, the bromide of silver dry plate shall be rendered sensitive to colour by means of a red colouring material, whilst the blue and yellow colour solution serves for covering gelatine mirror plates, which, after drying, are used together as a green light screen. The highest lights in the copies must be pure white. Moreover, in copying, certain points of view must be kept in view; and, firstly, care must be taken that the prints receive a neutral tone as possible in the gold bath, so that, on the further treatment thereof with the aniline colours, no false colour effects are produced. The gelatinous covering, which, in consequence of its porosity, absorbs the colouring matter, is preferably prepared by means of white gelatine dissolved in water, because this article possesses especial advantage that it can easily be removed again by warm water in case the colouring has over-passed the edges, and so on.

In order to protect the aniline colours applied against the influence of



light, the gelatine is added to the salts of chrome mordants and so on; obviously other similar materials might be used instead of gelatine, such as collodion, glue, albumen, isinglass, starch, and so forth—in short, any gelatinous substance. In the colouring, care should be taken that the absorption of the colouring matter takes place at the same moment in which the brush comes in contact with the gelatinous layer. As, however, it is not possible to outline the parts of the pictures so quickly with the brush, and the absorption does not take place equally if the operation is slow, it is requisite, in order to prevent an unequal absorption from being visible, to apply the colours considerably diluted, and to repeat the operation several times, which, of course, prolongs the process.

In order to remedy this drawback, those portions of the gelatinous layer which are not to be coloured can be covered at those parts which adjoin the portions which are to be coloured with a spirit varnish insoluble in water. This is allowed to dry, and the surface to be coloured can then easily be treated with the colouring matter. Those parts to which the spirit varnish has been applied will absorb no colour, and can afterwards be easily cleaned, and the varnish removed by means of cotton soaked in alcohol. By the consecutive application of the three ground colours, the required shade can easily be attained. After the colouring is finished, the picture is coated with collodion, so that it is protected on the one hand against outside influences, and on the other hand the colouring is caused to appear more bright. The process is, of course, applicable with any kind of photographs, whether the same be upon paper, glass, porcelain, ivory, metal, mother-of-pearl, or other materials. In the case of production on a large scale, the three colours could be applied by means of printing or stencils.

#### PHOTOGRAPHY WITHOUT LIGHT.

"DR. W. J. RUSSEL has lately discovered that certain substances exposed in the dark room for several days act upon the photographic plate. That tin is one of these is certain" says Dr. Victor Schumann in the *Photographic Times*. "I proved two years ago its influence on dry gelatino-bromide emulsion. I have also recently repeated Mr. Russel's experiments as far as they refer to tin and gelatine dry plates.

"I applied the tinfoil sheets (which are sometimes manufactured of the thin commercial article, and sometimes of thicker material) in several ways. Some of the sheets were exposed at least eight days in the dark; some I exposed to the daylight, and others to sunlight. Before the application each sheet was polished with soft leather and Paris red upon a layer of plate glass, then laid in dark-room light on gelatine dry plates, and exposed from one to thirteen hours of steady light. Some of the sheets, by this process, showed a heavy impression, others rather less, and still others only a very light impression. To bring this out, pyro soda is useful with some bromide of potassium. The result of these experiments was unimportant from beginning to end. On no one plate had any reduced effect been produced; and a distinct discolouration of the plates, as I had obtained with tin, could be still less expected here. I merely mention that I had no better success in the same treatment with optical glasses of brass and steel. I found no inducement to continue my researches in this direction.

"If any one concludes that the same is true in regard to gelatino-bromide emulsion of tin, he is very much mistaken. My remarks on this subject should prove the contrary by my various experiments with tin; besides, I am far from wishing to write, in this work, of the dark rays of tin. It has rather to do with electro-chemical effects which take place between the metals and silver alloy.

"To a better understanding of my remarks, I will place the results of my researches in the following order: On two glass plates rubbed with weak gelatine bromide silver (ultra-violet sensitive plates of my restoring process), I lay in dark-room light two thick tinfoil frames. To obtain a close contact, the plates and foil in the copy frames should be firmly pressed together. Then I place one frame in daylight, the other is exposed in the dark. After a few days each plate shows an almost perfect black impression of the foil. The foil itself has taken on the black spots of the plate; it has lost its mirror-like smoothness, and is of a dirty grey colour. The impression of the one exposed to the light differed very slightly. The light has consequently not acted upon the impression visibly.

"That the tin had acted in a far shorter contact I perceived by developing such a contact plate. I make this exception to the unlooked-for appearance of my experiment to the lower part 1000 ÅE photographic rays.

"The already-used plates must be covered almost to the full spectrum of a corresponding rectangle. I chose one with a fitted segment between the cassette wall and tinfoil plate of the whole size of the plate. During from half to one and a half hour's pressure, the plates and tinfoil are in an atmosphere of hydrogen gas under a pressure from ten to twenty mercury columns. The duration of the contact was longer than the exposure to the light. I make the exposure longer, especially the exposure secondary, as the spectrum rays have not acted to a certainty on the tinfoil.

"Then there, where the spectrum band falls on the tinfoil (that was on both sides of the segment), no visible effect was ever produced. The

plates were coloured, with few exceptions, when the whole space was disclosed, only near the edge, which was surrounded in larger or smaller spaces with peculiarly formed spots in lined succession. In the centre of these spots could be distinguished small silver shining rings with a high light of the colour of the negative. Feathery shapes passed through the high light like rays coming from the centre, which, however, were produced by the metallic residuum under the action of the tinfoil in the electro-chemical process and the development of salt crystals. The spots are of several sizes. Some are as broad as the plate and disperse in the form of tiny flames; most of them seem like little aureoles around the shining ring.

"Nowhere is formed a correct impression of the tinfoil layers. This circumstance should not appear strange, as an intense pressure of the plate on the tinfoil, as in copy frames, was not to be obtained. In a striking way, the larger spots extended over the cut-out segment where the direct influence of the tin was impossible. I surmise that in the contact they receive the ingredients of tinfoil (SnCuPbFeNi), and the silver haloids pictured in the development are spread over the plate and also over the cut-out segments, and have taken on the colouring of the unlighted remaining suffusion. It is less easy to explain where, on the contact plate, the necessary fluid acts in the electro-chemical process, for the plates are well dried and kept particularly from dampness. That the hydrogen gas which followed the exposure should be used for that purpose is not probable. On the other hand, the remaining ones without the tinfoil sheet, there, where they lay on the edge of the metal case, also show spots. That in truth a fluid has formed between the tin plates seems probable, as they cling so closely together after the exposure, quite as though they had been glued.

"It may seem that these spots are surface blemishes of the plates or the work of pressure, but those produced by tin are so radically different from surface defections and from the colouring of those produced by pressure that the confusion of the two is impossible.

"I did not pursue these experiments further. Therefore, as they resulted solely as sporadic appearances of other observations, they can raise a slight claim to integrity. What remains for me is to remark on the sameness of both Mr. Russel's experiments and my own. But at the same time this also shows how carefully one must go to work for an explanation of supposed photographic light workings if one does not wish to run into the danger of mistake in the work."

#### MR. A. BOGARDUS ON THE SITUATION.

THE veteran contributor to the *St. Louis and Canadian Photographer* thus delivers himself of sundry ideas in a recent number of that magazine:—

"The writer is about tired of badgering self-constituted critics. They still continue to 'say on' and will, 'until death do us part.' It may be that they are not good for anything else. The vast multitude are too busy to give much attention to any one man's opinion. Very few have ever read a president's message entire.

"Our English contemporaries are filled with reports of the meetings of their numerous societies. The British Isles seem to have enough societies to give every man an office, and make him happy thereby. May they all prosper, and each and all dispense information, good dinners, and prime cigars to every attendant.

"It is hardly worth while to worry much about paper trusts. The world is large and full of live men. Paper will be furnished for use and all demands supplied. Attempts to monopolise the world's needs may work for a time, but in time they will be upset and the world will go on as if they had never existed. Noah once had a monopoly of the water, but there are plenty of boats that plough their way over the vasty deep nowadays, fare low, accommodations good, and return tickets half price. Tennyson says:

"The world, the world,  
All ear and eye, with such a stupid heart."

"It is not worth while to attempt photography with either a stupid heart or a stupid head. To succeed, the party must be on the alert, quick to perceive, quick to remedy. Without these, everything will run loose, even hopes and expectations, results will never be success. It is common for a family to show impressions produced by Alexis with his camera, and tell how successful Alexis is. Your practised eye tells you that there is not a good picture in the lot. Alexis needs the 'know how' just as much as he needs his camera.

"Some game is not worth the powder. Learning to be a good photographer is worth all the care, skill, and attention you can give it. While you are expending these, you are not wasting ammunition on worthless game. Your money may be lost. The devouring flame or the cyclone may destroy your property, but acquired knowledge will remain with you as long as life and health shall last.

"Money makes the mare go, but sometimes the mare runs away. A clear head, a clear conscience and willing hands will bring the needed money. It goes fast enough itself without spending it on the above-named biped. Keep a good grip on it.

"There's many a slip 'twixt' the box of plates and the finished



picture. Most of the 'slips' are from carelessness or want of judgment. Of course, the plates or the chemicals get the blame when the innocent things are doing the best they can do under the treatment they are receiving. Failures, like successes, are in most instances home-made.

"The neighbours were invited to see whether the rigidly posed, newly painted portrait looked like Marier. It was yes and no, yet it was framed and hung until the next generation considered it too old-fashioned for their parlour. Then it was put in the garret to be used as a target for the arrows of the grandsons, who tried to hit the old woman in the eye at ten paces.

"Photographs of lightning are genuine flashlight pictures. The flashes are of great variety, and always with black background. They must be curiosities to the bad mortals who are afraid to look when the sky is in action and the display gorgeous."

#### DEVELOPING KODAK FILM UNCUT.

[Price paper in the *Photo-American*.]

If film is cut into strips and thus developed, there are several mishaps liable to occur, viz., 1, uneven development, spots, &c., caused by developing several strips in the same tray together, the films often adhering to each other in spots, thus preventing even application of the developer on all parts of each strip; 2, tearing the emulsion by repeated turning of the strips, causing holes which spoil the film, or at least are hard to fill up before printing; 3, tearing in washing by rubbing against each other as the running water, so necessary to proper elimination of hypo, turns them around and against each other; and, 4, if pyro developer, which is the best, is used, a sadly stained hand at conclusion of the operation is inevitable.

For these reasons I do not cut my film into strips, but develop the whole roll at once, and, although I have as many failures as the average amateur, I do not have holes in my film, soiled hands, or any of the troubles common to the other method. I am entirely through, and have my film-washing in half the time it took me by the old process, and in every respect get the most satisfactory results I have ever had. In developing the whole roll at once it would naturally be supposed that all would be developed alike, and that attention to the necessary modifications of developer in order to obtain the best results from all on a roll which contains over, under, and correct exposures could not be given. Not at all; each separate picture is treated, if necessary, and the results are much better than any I have developed in small strips.

How do I do it? Why, I pin the film on a board, face up, and paint them with a wide rubber-bound camel's-hair brush, kept full of developer while brushing. It is as neat as it is simple, and, short of developing each exposure separately, is the most rational way of going about the work scientifically. The materials necessary are two boards four feet long, one for developing and one for fixing upon; a two to three-inch rubber-bound camel's-hair brush, some developer, hypo, blotters, and absorbent cotton. From start to finish the fingers are not even wet with any chemical used; therefore, dear, nasty, old reliable pyro, which cannot be beaten for films or plates, may be used. I could write a long article based on experience, singing the praise of pyro, and could prove by negatives of my own and those of my friends that it has never been equalled as a developer; but, as that is not the subject I started on, I'll switch off. Before darkening the room (the bath-room, of course) I prepare two ounces of fresh developer and pour it in a small tray. In another tray or saucer I have old developer, and in still another ten per cent. bromide of potash solution. There is also a bottle of hypo solution with a goodly tuft of cotton handy. Now darkening the room and lighting my lamp, I spread clean blotters on my developing board, which is of half-inch clear pine, four feet long and one foot wide, and, unrolling my film, pin it, face up, on to the board, two pins at each end and two on the edge, about in the centre, being plenty. I generally develop two or three rolls of folding pocket Kodak film at a time. Now filling my brush with water, I gently brush all the film over, enough to soften the emulsion, and then in the same manner paint the strips with fresh developer, keeping the brush moving slowly over the film, enough to ensure its being moist with developer all the time. The over-exposed ones come up first, of course, and those are first swabbed over with bromide, and then kept wet with old developer and bromide alternately. I apply these with a tuft of absorbent cotton held on a stick with a rubber band, stick and cotton to be discarded each day. The other films, meanwhile, have been developing nicely, and can be so manipulated that they finish with the rest, adding little touches of bromide, old developer, or alkali, as needed, with a round brush. The under-exposed films are given all possible encouragement by treatment with developer suited to their wants, and by a hot blotter of the right width slipped under them. This is a very effective accelerator, and helps the film as no amount of developer would. I keep a few blotters wound around the hot-water pipe in summer, or the steam pipe in winter, and thus have them right at hand. Those whose dark rooms have no such convenient arrangement can, doubtless, heat the blotters on top of the dark-room lamp. The films remain moist with developer nicely, and it is no trouble at all to keep them covered if well wet at first. I never had a case of spotting yet from unequal application of the developer by the brush, and I have developed

a large number of rolls in this manner. In winter, if the film is brittle, a drop or two of glycerine in the developer will be found excellent. There need be no hurry, no worry about results, and an easier way of improving a negative by local treatment could not be imagined, as it all lies before the operator as plain as a picture, and the spots which need bringing out or retarding, as the case may be, show plainly. In developing a number of strips at once in a tray, one cannot stop long to doctor little patches, because the other films need constant turning; so all get the same treatment practically, and we all know what the average is by such a manifestly imperfect method. Having finished developing, remove the pins, and, with a bit of blotter grasped between thumb and finger of each hand, remove the film to the other board, which is not covered. Pin it down securely, using about eight pins, and put it in the bath tub under the tap to clear it of stain. After a few moments remove it to the table and mop it over gently with a large swab of cotton containing all the hypo it will hold. Continue to drag the swab of hypo over the film, taking fresh solution as necessary, until it is completely fixed, which can be ascertained by unpinning one end and examining the back. I purposely do less swabbing at one end, so that, when that end is found to be fixed, it can be depended upon that the whole roll is. This saves examining more than a couple of inches at the end.

When this part of the work is complete, I place the board in the bath tub, film down, and let it float upon the surface of the water, which is kept changing. If the weather be warm, the film can be painted with alum solution during any stage of the performance. It is well to do this after fixing always, even though not apparently necessary, as the film may soften in the wash water. Washing is very thoroughly accomplished in fifteen minutes. Everything upon the film which we wish to wash off, the hypo, to wit, is heavier than water, and consequently falls off better in the tub when on top of the water than it would were the water on top of it. If the film was much under-exposed, and prolonged development has left it considerably stained, it should be painted with a weak solution of tartaric acid after washing a few minutes. A saltspoonful of the powdered acid to a cup of water, or, to be more exact, two grains to the ounce of water, will be strong enough to remove the greater part of the stain. All the stain should *not* be removed, especially from a thin negative, as the colour in the film helps the printing in the shadows. After the acid treatment the full amount of washing should ensue, when nothing remains but to swab the film with glycerine solution, made of glycerine, quarter fluid ounce (a teaspoonful will answer); water, eight ounces or one half-pint. After swabbing this solution over the negatives two or three minutes, stand the board on end in a dry but not too warm room until quite perfectly dried. Then throw away the mixed developer, swabs, also the blotters, if much soiled, wash the developing brush well, and all is through with. There is nothing to clean up, no mess of any kind, fingers are as dry as at the commencement. Each board must be marked, and always used for the same operation. This method has also the advantage of being the most economical of any, for very small quantities of developer are used, as will be noticed. I have never had occasion to use wider films than bull's-eye  $3\frac{1}{2}$ -inch, but I should not hesitate to use the same method on films of any width if I could get a soft brush wide enough. I believe this method of developing will be new to a majority of the readers of this JOURNAL, and, though it is often truly stated that amateurs should steer clear of new things photographic, I can vouch for this one, as it has been in use at my house over a year. Ladies will appreciate its cleanliness especially, though many men have as much dislike of nasty stains on the hands as the next person. The films are so clean and perfect too, free from defects such as holes, scratches, and tears, which are almost unavoidable by old methods; they are a real pleasure to look at. It is an ideal method, and well worthy of adoption by all who use films.

L. JARVIS.

#### IN BROADLAND.

In a recent issue of the *East Anglian Daily Times* (Ipswich), a well-known literary and musical critic, writing over the signature of "Lounge," draws the following charming pictures of the Broads, a part of England so much in favour amongst photographers:—

"The Broads once more! No schoolboy, the journey money in his pocket, ever desired to shout in triumph more eagerly than I, as the splendid Cromer express, with which the G.E.R. has now brought Poppyland and Broadland to the doors of all the world, set me down, hot, thirsty, but happy, at Wroxham Station. Books, music, and all the other stern facts of life were left behind; and, inasmuch as at least seven years had gone by since last I set foot, so to speak, on the Broads, and in these years I had accomplished a small odyssey in many lands, I was anxious to see how far my old recollections would accord with the new impressions, for the Broads as a holiday haunt had been my earliest love—a calf-love, if you will, to begin with; but it had lost none of its strength in succeeding years, and now I wondered if a more travelled eye would find the same charm and romantic quiet that had of old seemed to invest every part of those placid waterways. Changes there must needs be, of course, for the tripper and the speculator are abroad, and the very railway facilities which enable the true lover to attain his felicity more easily also bring a horde of cheap and noisy



tourists, who are neither decorative nor sympathetic. Tales, too, had been told me of the gradual encroachments on the public privileges by greedy landlords, and I almost wondered if any Broad were left on which one might sail unchallenged. But, for the moment, it was enough to be once more at Wroxham, where my host awaited me to lead me gently on board the *Leisure Hour*, most comfortable of wherries. Already it was plain that even here civilisation had set in with something like severity. A fakir, in the dress of the Suffolk rustic, sold 'hokey' by the dusty roadside, advertising his fearful wares in cries of exceeding hideousness; 'Universal Providers'—unconnected with him of Westbourne Grove—offered everything that a yachtsman could desire, save only fair winds and weather; and, pleasantest change of all, one found that the quaint and comfortable Horse Shoes Hotel had passed into the hands of the genial George Smith, whom I had learnt to know, at Brundall and at Oulton, as an excellent provider of dinners for those who had grown weary of the tinned foods that, after a week or two, seem to grow so appallingly in tinniness. For half a mile below the bridge the river was crowded with all manner of craft, huge wherries, yachts of varied tonnage, skiffs, and launches of many shapes and sizes. And there, flying her blue and yellow pennant, lay the *Leisure Hour*, twenty-five tons register, and classed A1, not only by Grimsell, of Reedham, her owner, but by all who knew her comfort. . . .

"Leaving the river with its Saturday trippers, we turned the sudden corner that leads into Wroxham Broad, and dropped anchor in the silent water. Hardly could you discern a trace of human existence; the farm buildings at the south end were apparently deserted, and the single wherry that had preceded us was all but hidden in its corner as we crept noiselessly along. Not even a fisherman was in sight, in this famous haunt of pike and tench; but, before we had snugged down for the night, a boat appeared from nowhere, and half-a-crown was demanded in the name of some unknown owner. Then it appeared that the Broad had now two owners, and the line of division was indicated by two white posts, bearing notice-boards that could not be read at three yards' distance. One proprietor we knew—Ellis, a farmer and sportsman of great knowledge; and, since it seemed that we were but a few feet from his half, we hove our anchor and drifted across the line into our friend's water, leaving the representative of the unknown to depart uncrowned. Had we crossed the line as we swung at anchor, I do not know what would have happened, but I suppose that assessors and surveyors would have been called in to decide how many pence were due to each proprietor. And then it was dinner-time, and a cook who, within his not very narrow limits, was a man of excellent resources, spread a table in that pleasant wilderness which would not have disgraced many a club. The blazing heat of the day was followed by a very misty night, with a pale moon rocketing through driving clouds; and, when you turned out on deck for a moment, your shadow made strange Brooken spectres on the whirling fog. But what matters fog when you have a snug saloon, a pianoforte, and two ladies to play the violin to you? Thereafter came that happiest of all sleeps that is known only to those who have been cradled in yachts; and it seemed but five minutes till the swish of water on the deck told that a new day had begun. It was Sunday, and there was more than a Sabbath stillness over the glassy Broad, where each water-lily and sword-like gladden found its perfect image. A reed-warbler balanced himself sideways in the reeds, and talked cheerfully; a coot came silently from his nest, and fled, as three Adamo figures, not without prophetic shivers, emerged from the cabin and flung buckets of chilly water over each other; for swimming in fresh water is an abomination, and three or four buckets of fresh water, if you stand up to them manfully and unafraid, are a joyful beginning to such days as we were to spend.

"Monday morning sees us, after certain necessary purchases of fresh meat, eggs, and vegetables, starting for Heigham Sound. All goes well till we are past picturesque Horning, where dirty children, visibly embodying the results of cheap education, run along the bank, dolefully chanting 'John Barleycorn' in the hope of backsheesh. By the time we reach the mouth of the Ant, however, the tide has turned, and the wind is contrary. There is no hope of reaching Heigham Bridge that night, and we anchor just opposite the crumbling ruins of St. Benet's Abbey, the home of many loquacious jackdaws and starlings. Fifty yards astern is the dyke that leads to South Walsham Broad, whither we pull after dinner in the cool of the evening. For me this is the most beautiful of all the Broads, especially when you make your way across the larger lake and push on into the inner Broad. The hand of the spoiler is at work here; and, though I believe that as yet no attempt is made to enforce legally a demand for payment, a notice-board, marked 'Private,' at the entrance is a prophecy. I express no opinion as to the legal rights of the principal landowner here, but I confess I would give a good deal to know by whose authority the public staithe is practically blocked with the bulk of an old wherry. There can be no possible question as to the public rights in that staithe, and the blockade should be made a matter for public protest at once. Of course, nothing will be done; there seems to be so utter a lack of public spirit in those who are on the spot that the insidious beginnings of encroachment are allowed to go unchallenged. The small tenants—I am not speaking now of Walsham Broad, but of the question as a whole—are afraid, in many cases, to give evidence against their landlords; the yachtsmen and sportsmen, who are

most interested, are a scattered tribe, amongst whom it is very difficult for obvious reasons, to establish any solidarity of interest and action; and it is already plain that, in another twenty years, the Broads, as we of this generation have known them, will practically cease to exist. When the test case of Hickling Broad was fought, all the weight of competent evidence that was brought forward failed to convince Mr. Justice Romer, and we—the public—were awarded only the sailing rights, the fishing and shooting rights being lost for ever. There is a tradition current now—I give it for what it is worth—that this same learned Judge, after the trial of this case, paid a visit to the Broads, and that, having examined the matter for himself, he found reason for changing his opinion on the whole question. His judgment, unfortunately, cannot be changed, though hundreds of yachtsmen are as certain that the water in Hickling is tidal as that it is tidal in the Orwell. Well, public apathy has its own bitter reward, and those on the spot who might have prevented these losses of privilege and pleasure will repent too late when, with the Broads practically closed to, and therefore deserted by, the public, they find their properties depreciated and many sources of income reduced or extinguished.

"Heigham Sound is held by some to be the most picturesque part of the whole district. That opinion I do not share, for I confess I tire soon of these grey wastes of reed and gladden. Wild it certainly is, and worth seeing; but, after a single day spent in its cold monotony, I long for the more peaceful and dreamy variety of water-lilies and willows, and the wide, unfurrowed mirrors of Walsham and Wroxham. But the Sound is a convenient starting place for Horsey Mere and Wroxham, though the dyke that leads to the latter is now so foul with weeds that only the lightest of craft can navigate it. Weary work it was to pull and push our heavy centre board dinghy up that bewildering desert of weeds; and, when at last we reached Wroxham, it was to find impertinent notices that declared even the old gap through the sandhills to be 'private.' Lying that night below Heigham Bridge, to be ready for an early start for Yarmouth the next day, I fled across, by train, to the bloated town to look for letters, newspapers, and other signs of a half-forgotten civilisation. Just twenty minutes had I in the town before the last train started back; but the following afternoon saw us all lying by the old tower that marks the mooring-place of yachts in that unspeakably dingy river. In Breydon water a splendid breeze was blowing that carried us to St. Olave's in much less than an hour; and, though in sailing a wherry one has not the same sense of intimate connexion that comes when one's hand is on the tiller of a racing cutter, it was as fine sailing as one could ask. A wherry is heavy to handle in a strong breeze, and my personal comfort was not increased by the fact that the skipper, a man of short stature, had caused the rudder head to be shortened, so that he might lean on the tiller where his body was best fitted to the pressure. This brought it fully six inches too low for me, with somewhat painful results to my person; but that wild rush across Breydon still remains in my memory as a most exhilarating piece of sailing. At St. Olave's we found that excellent hostelry, the Bells, in new and very capable hands, and the luxury of cigars, coffee, and liqueurs were ours after dinner. A choir treat was in progress, and some capital singing was to be heard; and then there was a little dancing, and much genial merriment till far in the night. That night, too, was our last, for the next day found us on our way to Oulton and home. It was the best day of all, in point of weather, the last day of one's holiday always is. But there could be no regrets, looking back on such a week; for the physical beauties of the Broads are not, to my mind, necessarily their greatest charm. They are great, indeed, and nature speaks there with a voice so strange and new that, though all must hear and listen, no one has yet interpreted it with complete success. Not even Swinburne; not even my companion—the Dr. Emerson, who, in *Wild Life on Tidal Water, Life and Landscape of the Norfolk Broads*, and half-a-dozen similar volumes, has caught and recorded so many secrets of that wonderful life. He has crept closer to the heart of these things, their wildness and charm, than any other writer; but at the back of all is an incommunicable mystery, a soul that is revealed only in sudden moments, and lures the nature-lover to follow the flying feet. For me Broadland still remains, in spite of noisy trippers and tearing launches, one of the last strongholds of that elemental beauty which elsewhere is fast disappearing. The lagoons in Venice, Barbizon in France, the Broads in England—the same voice speaks in all for those who have ears to hearken."

#### AMERICAN DRY-PLATE MAKING AND DRY-PLATE TAKING.

[A lecture delivered before the Columbia Photographic Society.]

DURING the past few years photography has advanced with such giant strides, both from a practical and artistic standpoint, that it has hardly been possible for even an adept to keep pace with it. Every day makes it more difficult for one to enter the line with those ahead of him, and hence it may be assumed that a few hints, such as these are intended to be, may prove an aid looking toward successful results, and make easier a pathway strewn with trouble.

One of the truths just brought home to the venturesome tyro who invades the magic realms of photography is that there are a lot of



illusions to be dispelled, a lot of false impressions to be corrected, and, what is more to the point, a whole lot of serious study involved before one can take or make a good picture. The oft-used "you press the button" may go with the schoolboy who trusts to chance or favourable conditions to gather an occasional subject, or, with the young lady who cares not to soil her lily-white hands with chemicals, and looks to adoring and indulgent parents to "do the rest;" but let me assure you that, while the "press-the-button" theory has been the means of drawing into the photographic ranks thousands, many of whom have learned to their sorrow that the mere manipulation before mentioned does not entirely constitute photography, to produce the best results one must go about in the good old-fashioned way.

An axiom might be suggested to the effect that to take one really commendable picture is far better than to trust to the uncertainties of a dozen chance "shots," whether the medium be films or dry plates. There are numberless cases where anything but instantaneous work is impossible, but is simply a necessary evil. At the same time the tripod camera, combined with time and patience, a careful study of subject, light, and other conditions is unquestionably the only sure means of attaining the desired end. A professional photographer only "snaps" a baby because he has to, and not because he wants to, and you can easily determine to your own satisfaction that in any gallery he takes due time when he deals with those of the age of intelligence.

With this introductory regarding the making of dry plates a few points may not be amiss, especially in view that suggestions regarding their manipulation may follow in logical sequence. It is not to be doubted that the majority of persons have studied photographic chemistry, if only in a superficial way, and have a general idea of the means by which we obtain a dry plate. As a certainty, however, I will assert that few possess knowledge of the actual details regarding their manufacture on a commercial basis, or the care needed to be used, or the means taken to produce a merchantable article, and one which will hold its own beside other brands. If this knowledge prevailed, you can rest assured that there would be fewer complaints from the consumer, and a greater appreciation of and wonder at even the existence of such an article as a dry plate.

You can take it for granted that the perfect plate has yet to be made, the same as the perfect negative produced or the perfect print toned from it. Were it not for the possibilities to be obtained, photography would cease to be an art.

The manufacturer of a dry plate has many things for which he is to be blamed, no doubt; but the category does not include everything. It can be asserted positively that the party who attempts to place a defective plate on the market simply commits suicide, in view of the existing competition and demand for only a first-class article. The glass used must be of the best and free from bubbles, the right substratum employed, the emulsions uniform, the speed fully maintained, and the developing qualities of a simple nature, the resulting plate one that shows fair results under almost any conditions of light and shade. To produce such an article means work that the average photographer usually fails to comprehend. The emulsions are made up a couple of weeks ahead, tested many times, filtered twice or thrice through chamois skin to ensure positive freedom from dust, kept at a uniform temperature while being flowed, and again tested after being dried. The finished plate is subjected to ruby light at least seven or eight times before finally packed.

In this connexion I beg to state that the light employed in a dry-plate factory is deep ruby, and *never* a combination of orange and ruby. The average photographer uses more light in a small dark room than is employed in an entire factory.

Dry plates are simply fed upon travelling tapes, which pass under a small silver tube, having a slot in it which permits the emulsion to flow through, and then are immediately drawn over ice in order to set the emulsion. This latter object is attained within a few feet, and an employé there stationed picks them up, places them in racks upon a truck, which is wheeled into the drying-room when filled. Here another important point is involved, as the plate takes from three to four hours in drying, and the temperature, if allowed to check this drying by only a few degrees, the result shows a stain that simply spoils them, and which cannot be removed. Another factor is the air used, and it must constantly be changed. Usually the air is drawn from a tall chimney, drawn through water and dried over steam pipes before being used in a factory. The floor is also sprinkled in order to avoid dust being circulated therefrom. The employés are compelled to wear rubber-soled shoes, and everything is done in the power of man to obviate the slightest particle of dust or dirt being raised.

Plates are usually coated in large sizes, assorted, and cut down to the smaller ones. An 8×10 plate thus yields not only 5×8 but the 4×5 size. Extreme care is always necessary in the cutting room, as particles of glass not removed at once can easily spoil the next plate. Another point that must be considered by the manufacturer of dry plates is the risk incurred in shipping them to their destination. If they are forwarded by rail, they may be packed alongside of coal-oil products, and are thus irretrievably ruined; if shipped by steamer, they may encounter water in the hold of the vessel, or, if on the upper deck, encounter a wave that will also render them useless. It may not seem amiss for me to reiterate here the fact that it must seem to the educated photographer a wonder that

dry plates have ever reached their present condition, or existed at all, in view of the difficulties attending their manufacture.

It is with reluctance that the second part of this subject must be approached, if only the simple reason that more depends upon the intelligent handling of a plate than upon its manufacture, which is worked out upon a scientific and exact basis, tested by experts, and never placed upon the market by any reputable manufacturer without being fully up to grade, and equal to all demands that might be placed upon it. As to exposure, the fact has been proved that judicious development can alone bring best results. The late Professor Newton, in my own presence, took over seven hours to obtain those famous negatives of the Hell Gate explosions, while, on the contrary, over seven hours' exposure was required to make a picture of the interior of Trinity Church in New York, with but a short period of development.

It is a matter of regret to all manufacturers that so many persons rely upon snap-shot work instead of the old tripod-camera business, and I take extreme pleasure in reverting to this fact. Why persons should risk so much to obtain so little is a wonder that cannot be explained. Our best view photographers often study a view for weeks from "every clog of vantage" before they will even expose a single plate. Why, therefore, expect to make a dozen immaculate photographic views in a single afternoon, and then blame the manufacturer of plates or films because you do not obtain a dozen perfect negatives?

Photography is a study, deep as any science known, with under-developments on all sides, over-developments on the part of the unthinking, and with possibilities so far buried in the future that none can fathom them. Do not labour under the impression that the changing from one camera to another may mean success, or that if you had this or that lens, you could gain the ideal, or that, one developer is so much better than another, that to use it will place you upon the topmost pinnacle. Use what you have, adhere to what you have, study what you have, and you will learn the lesson, attain the success, make photography a pleasure to yourself as well as a lesson in a noble science to your friends.

WILLIAM F. MILLER.

#### THE ACTION OF NASCENT SILVER IN DEVELOPMENT.

DR. KARL SCHAUM in his paper published at p. 469, vol. xlv. of THE BRITISH JOURNAL OF PHOTOGRAPHY, referring to the building up of the developed image, appears to suggest that the bulk of the silver forming the negative is produced by reduction from the unaffected silver bromide in the non-image, the additional silver being deposited upon the silver of the image. I believe that this theory has frequently been put forward, but I have never been able to understand how such action can take place with alkaline development, unless the developer contains a solvent for silver bromide, and the presence of a solvent does not appear to be essential to the attainment of density. Further, Dr. Schaum seems to misinterpret the subhaloid theory in suggesting that under it an exposed and fixed plate should be developable in an ordinary developer without any silver. The fact that an invisible image, amenable only to a process of silver intensification, remains after fixation, appears to me to be strictly in accordance with the subhaloid theory, which also seems to afford a satisfactory explanation of the manner in which density is obtained in the ordinary process of development, quite independently of the existence of the unexposed particles of bromide in the non-image.

Consider the case of two adjacent particles, one in the non-image and one in the image. The two are separated by intervening gelatine, and while one is totally unaffected by exposure the bromide in the other has been partially reduced to a subsalt. There is no reason that I can see for supposing that the whole of the exposed particle is converted to a subsalt, the contrary is indicated by the fact that both particles practically disappear in a fixing bath; and, further, the opacity of the particle should prevent the light from reaching every molecule of it. It may reasonably be assumed that only the outer molecules of the exposed particle are affected by light, so that it consists of unaltered bromide surrounded by an outer skin of subsalt. On the application of the developer this subsalt is reduced and nascent silver is produced in contact with the normal salt in the interior of the particle, and the immediate result of such action can apparently only be an increase in the amount of subsalt, for presumably the reduction of a molecule of  $\text{Ag}_2\text{Br}$  in contact with a molecule of  $\text{Ag}_2\text{B}_2$  must result in the production of  $2\text{Ag}_2\text{Br}$ . It would appear that this process must continue until the whole particle is reduced to subsalt, after which the production of metallic silver in a permanent form would commence, and continue until either development is stopped or the whole particle is reduced to silver. Density will thus be obtained by the reduction of the normal salt remaining in the exposed particle after exposure is terminated, and independently of the adjoining unexposed particle, which may remain quite unaffected, provided that the developer has no solvent power and is so adjusted and restrained as to be unable to exert any direct reducing action upon it during the time of development. The image is then built up, not by the deposition of silver upon nascent particles, but by the reduction *in situ* of the normal salt that happens to be in contact with the nascent silver produced by development. The application of a fixing bath before development results in the solution of nearly the whole of the exposed particle, only an invisible trace of metal



being left by the subalt. A feature of this theory is the non-production of metallic silver during the first stages of development. This might be tested by the aid of ammonium persulphate; I have not yet made any experiments in this direction, but, as it is well known that no free silver can be detected in an exposed plate, it would be useful to determine how soon after the commencement of development an appreciable quantity is present.

Experiments on the constitution of the exposed, partially developed, and completely developed image would, no doubt, be more easily conducted on an extremely coarse-grained slow film, if such can be produced by any modification of the ordinary process, and possibly an artificial emulsion, consisting simply of large solid particles of bromide imbedded in gelatine, would serve the purpose.

Dr. Schaum states that he failed to reproduce Eder's experiments in reducing a film at the points where a silver wire had been brought into contact with it *without pressure*. Does not this appear to indicate that pressure is the cause of such reduction effects? With regard to Dr. Eder's experiment on a thick opaque gelatine emulsion, I have always been inclined to doubt the possibility of securing absolute opacity in a substance formed under the conditions of a gelatine emulsion, and Dr. Schaum seems to be of the same opinion. C. WELBORNE PIPER.

### LEEDS CAMERA CLUB ANNUAL EXCURSION.

THE present flourishing condition of the Leeds Camera Club will, no doubt, receive an additional impetus to its title to rank as one of the most successful amateur photographic societies in the North from the exceedingly well-planned and enjoyable excursion held on July 26, on the occasion of the Club's annual outing to Chatsworth and Haddon Hall, when the members and their friends, to the number of thirty-five, including a fair sprinkling of ladies, took advantage of the unusual privileges offered by the Secretary and President, who had the arrangements in hand.

Leaving Leeds at 8.50 a.m., Grindleford Bridge was reached *via* Sheffield at 11 o'clock, where two pair-horse waggonettes and a *char-à-banc* were in waiting to receive the party. The weather was dull at starting, but ere long the sun found glint through the sky, and, though at times rather threatening, yet delightful atmospheric conditions prevailed during the remainder of the day. After an hour's refreshing drive the conveyances reached the pretty village of Baslow, where, a private-gate ticket having been secured, the party entered Chatsworth Park by a near route, and a short drive brought the enthusiastic amateurs to the house, the princely seat of His Grace the Duke of Devonshire, K.G.

By the courtesy and kindness of Mr. Gilson Martin, chief steward, the members were shown over the house in one party, and afterwards were allowed the unusual privilege of taking pictures in the private grounds, a favour which was immensely appreciated, and cameras were soon at work securing many a lovely bit of those interesting and well-favoured grounds. The Fountains, as well as the Great Cascade, were also specially turned on for the benefit of the Club, and the large Fountain was photographed sending up a jet of water close on 300 feet in height.

After a couple of pleasant hours, gone only too quickly, a return was made to Baslow, where lunch was had at the Wheatsheaf Hotel, and the party again joined the waggonettes. Bidding adieu to Baslow, the drive was resumed by way of the model village of Edensor and Rowsley to Haddon Hall, undoubtedly one of the most perfect specimens of mediæval domestic architecture extant. Here the party separated into twos and threes for a little serious photographic work, the chapel, ball-room, and terrace receiving special attention by the members. Following, tea was hurriedly disposed of, and, mounting the brakes, the home journey was begun, the return train leaving Rowsley at 6.42.

It was generally felt that the time was insufficient to admit of anything like proper attention being given to the many excellent subjects both at Chatsworth and Haddon and the district generally, and many a member was heard to express a wish for a further acquaintance with the neighbourhood. Leeds was ultimately reached about 10 p.m., the whole party having thoroughly enjoyed a most delightful and interesting day's programme; and the occasion will remain as a pleasant remembrance of the good comradeship that exists in the Club, and to be talked of many times during the forthcoming winter session of 1899-1900.

## Our Editorial Table.

### THE NO. 2 FOLDING POCKET KODAK.

Manufactured by Kodak, Limited, 43, Clerkenwell-road, E.C.

Messrs. KODAK, LIMITED, are introducing a new Folding Pocket Kodak which takes pictures of the size of  $3\frac{1}{2} \times 4\frac{3}{4}$  inches on the ordinary No. 2 bull's-eye spool. In addition to this feature, there is the convenience of

the camera folding up to dimensions which admit of its being comfortably carried in any ordinary coat pocket. In appearance the new Kodak resembles the No. 1 Folding Pocket Kodak, and it is somewhat less in thickness. It is also provided with tripod screw socket, and is therefore equally adapted for hand and stand work.



When folded, the No. 2 Folding Pocket Kodak measures only  $1\frac{1}{2}$  inches in thickness, while it weighs only 16½ ounces. It carries a spool of film for twelve exposures. The shutter of the No. 2 Folding Pocket Kodak is the same as that adopted in the No. 1 Folding Pocket Kodak. It is always set, and separate levers are provided for time and instantaneous exposures. A third lever regulates the stops, of which there are three.

### PHOTOGRAPHING: SIMPLE INSTRUCTIONS HOW TO DO IT.

50 pp. Price 3d. By the Editor of Photography. London: Hiffe, Sons, & Sturmeay, Limited, 3, St. Bride-street, E.C.

It is not an easy task for the photographic journalist to write down to the level of those who know absolutely nothing of photography, and at the same time to make clear to them the elements of the subject. The temptation to take refuge in the brevities of technical terminology is at times irresistible, but in the little book before us Mr. Child Bayley has successfully avoided it. To nothing but a photographic Mavor can it, in our opinion, be more fitly compared; for the instructions are simple, the language clear, and it thus constitutes a useful introduction to the practical study of photography. There are seven chapters, and the descriptive accounts of the various items of photographic apparatus, manipulations in development, and so forth, are plain and to the point.

### THE RÖNTGEN RAYS IN MEDICAL WORK.

By DAVID WALSH, M.D. 258 pp. 103 illustrations. Price 10s. 6d. London: Baillière, Tindall, & Cox, 20-21, King William-street, Strand, W.C.

DR. WALSH's book has run into a second edition in less than two years—a sufficient proof of its use to medical men. The first seventy pages of the work are occupied by a full examination of the electrical apparatus and methods available for the special needs of medical radiographers, and then for the remaining 170 pages we have the medical and surgical applications of X-ray work exhaustively set forth and very liberally illustrated. Dr. Walsh has evidently been at great pains in selecting the numerous cases drawn from actual medical and surgical practice in which the practitioner has found it of advantage to call in the aid of radiography, and the result is what we should imagine must be a reference book of the highest value to those engaged in the healing art. A large number of the illustrations are full-page, and all of them are very informative. The book is well produced, and altogether it strikes us as a most useful addition to X-ray literature, and one, moreover, that even a layman may study with profit and advantage.

### CHIMIE DES MANIPULATIONS PHOTOGRAPHIQUES.

Gauthier-Villars, Masson, & Co., Paris.

THESE two small volumes by M. G. H. Niewenglowski form part of the *Encyclopédie Scientifique des Aide-Mémoire*. Vol. I. deals with the negative, the processes of development, fixing, reduction, intensification, &c.; and Vol. II. with printing processes, toning, &c. The volumes are very compact, and the subject-matter well arranged.

### KATALOG PHOTOGRAPHISCHER APPARATE UND UTENSILIEN.

R. Lechner (Wilh. Müller), Vienna.

THE well-known firm of R. Lechner, Vienna, has sent us their catalogue of photographic apparatus, &c., and for elegance and completeness it has few rivals. Most of the articles are illustrated and described in detail, and an inquiry sheet is provided upon which the customer is invited to send particulars of anything he may require. Numerous process prints from photographs taken with apparatus supplied by the firm are also submitted.



## News and Notes.

**PHOTOGRAPHIC CLUB.**—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, August 9, at eight o'clock. Members' Open Night.

THE Departmental Committee appointed by the Lord President of the Council to consider the question of the reorganization of the Education and Science and Art Department consist of Sir Horace Walpole, K.C.B. (Chairman); Sir G. W. Kekewich, K.C.B. (Secretary of the Education and Science and Art Department); Captain W. de W. Abney, C.B. (Principal Assistant Secretary of the Science and Art Department); Mr. S. Spring Rice, C.B. (of the Treasury); and Mr. W. Tucker, C.B. (Principal Assistant Secretary of the Education Department).

M. EMILE ZOLA, while awaiting with intense eagerness the issue of the Dreyfus court-martial at Rennes, is busy in his country house at Medan over the snap-shots which he took in London in his character of amateur photographer as well as searcher after human documents. His collection of photographed scenes and persons is varied and interesting. He has hotels, bridges, public-houses, and an assortment of the tatterdemalions and castaways who are, he says, so numerous in London. M. Zola laments that he lost several shots, notably one of a flower shop, where he bought bouquets every morning for his wife when she was ill.

MR. A. F. STANLEY KENT has been appointed Professor of Physiology in University College, Bristol. Mr. Kent received his scientific training at Oxford, which he left upon being appointed demonstrator of physiology in Owens College, Manchester. In 1889 he was invited by Sir J. S. Burdon-Sanderson to take charge of the histological department at Oxford, to lecture on special points in physiology, and to assist in the teaching of general physiology. Since 1892 he has been assistant lecturer in physiology and histology at St. Thomas's Hospital, and has carried out a number of researches, the results of which have been published in various journals, proceedings, and reports.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
7.....	Borough Polytechnic.....	{ Excursion: Gomshall and Shere' Leader, A. Belding.
7.....	Croydon Microscopical.....	{ Excursion: Gomshall, Leith Hill, and Holmwood. Leader, F. J. Townsend.
7.....	Kingston-on-Thames.....	{ Excursion: Winchester. Leader, H. M. C. Sprunt.
9.....	Photographic Club.....	Members' Open Night.
9.....	West Surrey.....	Open Night.
11.....	Croydon Microscopical.....	Conversational Meeting.
12.....	Darwen.....	Excursion: Whalley and Mytton.
12.....	Kingston-on-Thames.....	{ Excursion: St. George's Hill, Weybridge. Leader, W. M. Robertson.
12.....	Manchester Amateur.....	{ Excursion: Hathersage. Leader, J. Wood Smith.
12.....	Oldham.....	{ Excursion: Whalley Abbey. Leader, R. T. Taylor.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 27.—Mr. P. Everitt in the chair.

Mr. Hodd showed the whole-plate negative which he mentioned at the previous meeting as having blistered after reduction with ammonium persulphate. He had pricked the blisters, and they now were scarcely noticeable in the print.

Mr. BANKS thought the cause might be due not to the hot weather, but to oxygen liberated during the action of the persulphate. If blisters were due to water having got beneath the film, soaking the plate in alcohol would remove them, but this treatment has no effect if the film has been raised by imprisoned gas.

Mr. S. H. FRY had recently been troubled by blisters occurring in bromide paper during toning in the acid alum bath. He thought this must be due to carbonic acid gas. Probably there was an alkali in the paper, which was decomposed by the acid in the toning bath. He found the best method to cause the gelatine to adhere to the paper again was to make two pricks in the print, one in front and one behind, so as to allow the gas to escape and water to take its place.

Mr. BANKS said the carbonate present in ordinary water would be quite sufficient to account for the liberation of the gas.

THE HON. SECRETARY, referring to a former discussion on the effect of placing a sheet of paper behind a backed plate, said it was a fact that if a piece of paper were placed on the backing, that portion of the negative would develop denser than the other part. This was owing to light reflected from the paper.

Mr. TRAPE admitted this would be the case if the backing were not effective, but otherwise it would make no difference. He had found that even tinfoil could be placed behind a well-backed plate without any effect due to reflected light.

A discussion arose on the recent introduction of a paper for printing in colours. This was thought to be a revival of an old process.

Mr. BANKS remarked that beautiful colours could be obtained on ordinary paper by the application of various salts of manganese, iron, and lime.

### North Middlesex Photographic Society,—July 24.—A discussion on IS HAND WORK LEGITIMATE?

was the subject for the evening. Mr. F. L. Pither, who was unavoidably absent, was to have opened the subject. In his absence, Mr. J. E. S. MUMMERY (the President) read a short paper which was sent by Mr. Pither, in which he maintained that hand work, given that picture-making was the object in view, was perfectly legitimate, bearing in mind the shortcomings and limitations of photography. Mr. MUMMERY followed on with a few notes on his own account, bearing out and extending Mr. Pither's views. Mr. A. H. LIEBET, who took up the other side of the question, began by saying the very question raised a doubt. The purpose of it was to modify the shortcomings of the sensitive plate, or the negative may have been taken under unsuitable conditions, or to produce something different from what was obtained at the time of exposure. If the particular view you want is unsuitable, owing to atmospheric conditions or lighting, take it another time, when it harmonises with your mood. You should not attempt to obtain by photography what we know is unattainable by its aid. To exhibit a picture showing brush marks or varnish on the print, and call it a photograph, is downright falsehood. The discussion was taken up by many of the members, Messrs. H. W. BENNETT, J. MACINTOSH, S. E. WALL, and others contributing, and got rather lively towards the end, the general opinion being that hand work, if confined to the negative, was allowable up to a certain point; painting in figures, &c., should be barred.

### FORTHCOMING EXHIBITIONS.

1899.

- August ..... One-and-All Flower Show at the Crystal Palace (Photographic Classes). Hon. Secretary, E. O. Greening, 3, Agar-street, Charing Cross, W.C.
- Sept. 22–Nov. 4 ..... Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.
- „ 25–Nov. 11..... Royal Photographic Society. Hon. Secretary, Colonel J. Waterhouse, 12, Hanover-square, W.
- October 18–24 ..... Croydon Camera Club.
- „ 22–Nov. 19... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.
- Nov. 27–Dec. 18 ..... American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.
- December 7–9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Patent News.

THE following applications for Patents were made between July 17 and July 22, 1899:—

**DARK SLIDES.**—No. 14,656. "Improvements in Dark Slides for Cameras." M. C. RYPINSKI.

**LENSES.**—No. 14,672. "Improvements in Devices for Observing or Reproducing the Images Projected by Optical-lens Systems." E. ABBE.

**CAMERAS.**—No. 14,705. "Improvements in Photographic Cameras." Complete specification. F. MERCEAU.

**CAMERAS.**—No. 14,743. "Improvements in and relating to Photographic Cameras." S. D. McKELLEN.

**X-RAY APPARATUS.**—No. 14,826. "Improvements in or connected with Apparatus for use in the Production of Röntgen Rays." Communicated by the Voltahn-Elektrizitäts-Gesellschaft A. G., Germany. W. P. THOMPSON.

**VIEWING PHOTOGRAPHS.**—No. 15,006. "A new Means for Viewing Photographs." A. C. PEARSON.

**BALLOON PHOTOGRAPHY.**—No. 15,011. "Improvements in Mechanism for taking Photographs from Balloons or Kites." G. M. HEATH.

**PLATE-HOLDERS.**—No. 15,065. "Improvements in or relating to Instantaneous Printing-plate Holders." Communicated by S. Maybell and M. Maybell. W. P. THOMPSON.

**ANIMATED PHOTOGRAPHY.**—No. 15,096. "Improvements in Animated Photography and in Apparatus connected therewith." A. M. BARNES and E. COWPER.

**SHUTTERS.**—No. 15,144. "Improvements in Shutter Apparatus suitable for Photographic Cameras." J. JENSEN.



## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### DEALERS' TERMS.

#### To the Editors.

GENTLEMEN,—May I, as briefly as possible, encroach upon your valuable space with regard to this subject. All the chemists in this town have now, and for some time, entered upon the photographic department, and apparently do a small trade in that line. I regarded the fact with more or less indifference, but felt, at the same time, that I ought to have taken steps to have kept pace with the times and gone in for the dealer's department myself. The circumstance which made me decide to do so is that a small stationer has now cut into the business, and tells me that he gets wholesale terms without question; but, on inquiry, I find that I am absolutely denied by the Manufacturers' Association the same terms which the veriest outsider can get, thus enabling him to cut into what I regard as a privilege that ought to be mine. I presume the objection is, that the photographer, as a consumer, shall not reap the benefit of "dealers' terms." My wife, as a professional musician, has no difficulty in obtaining full trade discounts on either sheet music or instruments. Why should there be such a marked difference in two professions similar in character? The draper possibly buys his materials upon trade terms, whether to sell over the counter as material or in the form of garments, the latter eventually possibly yielding two profits, which the Association's attitude would lead one to believe they think the professional photographer quite rich enough to do without.

I have recently had my premises enlarged, and many facilities made to enter upon the dealer's business, in the best of faith of becoming a dealer if I chose. Consequently I feel the disappointment. No one, of course, wishes to prevent my selling again, but the discount of ten per cent. given to me as a professional does not leave a very encouraging margin after carriage is deducted. It may be that I am ignorant of the qualifications necessary for a professional photographer to obtain dealers' terms, for there are many such. There is a business advertised for sale in *The British Journal of Photography* for the current week, with "dealers' discounts." Possibly one of your readers will be good enough to advise me.—I am, yours, &c.,  
A WOULD-BE DEALER.

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

E. FENSKE.—Received. Thanks.

J. V. R. (Dublin).—We are much obliged for your interesting letter.

SOL RAY.—The *South African Photographer*, published by Messrs. Marshall & Brookes, Harp-alley, Farringdon-street, E.C.

W. H. BRISON.—We think you should have returned the camera in the first instance. Do so now, and you can claim the return of your money.

PYRO.—Better keep it in solution. By exposing to the air, it becomes partially converted into sulphate, which is the white powdery coating seen on the surface.

PYROXYLINE.—L. MOODY.—The sample of pyroxyline is quite unsuitable for bromide emulsion, or, indeed, any photographic purpose, for it is almost insoluble in a mixture of ether and alcohol.

COLLOTYPE.—A. L. As the ink obstinately refuses to adhere to any part of the film, it shows that the plate was under-exposed. Print deeper, and it may be well to increase the proportion of bichromate of potash.

LENS.—FOCUS. A lens of the type and focus you require, by one of our first class opticians, would probably cost you from 80s. to 70s. Most likely, it would have to be specially constructed, as it is not stocked by any, we suspect.

J. C. BAMLITT.—You appear to have fogged the plates during development. We presume they are first attempts! We should say there was nothing amiss with the apparatus. Careful study of an elementary book will put you on the right track.

VALIDITY OF PATENT.—DOUBT. Unless the specification describes the invention with such clearness that any workman with ordinary skill can work it, the patent is invalid. If the inventor has kept back any essential part as a secret, the patent is invalidated.

COPYRIGHT.—S. L. You cannot take action until you have registered the copyright. Under the circumstances, we doubt, however, if the copyright is legally vested in you. The negative is certainly your property, although you may not have a copyright in it.

CATHEDRAL GREEN GLASS.—S. BLACKETT. The tint known as cathedral green is difficult to describe in such a way that you would be able to select it with certainty. If you go to Hetley's, Soho-square, and ask for cathedral green, you will get the right thing.

COLOURING PHOTOGRAPHS.—ADA.—Messrs. Newman & Co., Soho-square, publish, or used to publish, a work entitled *Harmonious Colouring applied to Photographs*; better write to them. Wake's work has long since been out of print. That was published by us. It is, doubtless, the work your friend refers to.

EXHIBITION AND SALE OF PORTRAITS.—W. W. W. Certainly. Your customer can by law, as he says, prevent you selling copies of his portrait, or exhibiting them in the show-case, against his will, and you will find it a very costly matter if he puts the law in force. Don't you think it a very unwise policy to persistently give offence to sitters?

PRINTING TROUBLE.—BEGINNER. The fault of one of the prints is that the paper has not been pressed in places in close contact with the negative while printing. The other, the paper has been slightly shifted during the printing, probably when opening the frame to examine it. The remedy in future is obvious. No apology is necessary; we are always pleased to help beginners.

INVESTIGATOR.—1. We have failed to find the name of the agent, but we should imagine the goods could be obtained through such houses as A. E. Staley & Co. or Clement & Gilmer. Their addresses are in the ALMANAC. 2. At lower temperatures than 85° we have known films leave the support; on the other hand, we have developed some plates at over 100° without disturbing the gelatine.

NEMETO.—1. Our opinion of the trade in a town of the size you mention, and at the prices you propose to "cut," is that you would be worse off than you are at present. Your "cutting" notions entirely alienate our sympathies. 2. No; we do not think you would better your position. 3. The way to make money in photography is to open a cheap "quick return" business in a large industrial centre, or produce the very highest class of pictorial portraiture.

RESTORING LIGHT-STRUCK PLATES.—C. OLLIVER says: "I have about a dozen and a half plates that the light has got at, and fogged them. Can they be restored to their original condition, as I should not like to waste them?"—Yes; the method of doing it is given on page 1061 of the ALMANAC; but, with so small a number and so small a size, we should say they were not worth the trouble. Restored plates are generally found to be much slower than they were originally.

LENS FOR ENLARGING.—W. A. BAIN writes: "I have two lenses, an old whole-plate portrait lens and a whole-plate R.R. They both seem about the same focus. Which would you recommend me to use for enlarging from whole-plate negatives? Of course the portrait would be the quickest, but I want to get the best possible results."—By all means use the R.R., for, all things being equal, it will have the flatter field, and also give more even illumination at the margins of the picture.

FADING PRINT.—C. JOHNSON says: "I have an old photograph that has turned a little yellow, and, as the mount has been much soiled, and the picture was valuable to the family, I soaked it off, and remounted it on a new mount. When mounted, I was surprised to find that the print had faded very much and turned quite yellow during the operation—in fact, is spoilt. Did you ever hear of such a thing before?"—Yes, frequently; it is no uncommon thing for old prints that are soaked off their mounts to behave as the one referred to has done.

GLASS POSITIVES.—FIRST ATTEMPTS says: "Herewith some first attempts at glass positives by the collodion process. You will see that there are no whites in them, such as I have seen in some old pictures. The solutions are made according to the formula given in the ALMANACS. Can you tell me where I have gone wrong?"—Yes. The pictures are all over-exposed and over-developed. If they were a little more intense, they would be fairly good negatives. Give less exposure, and stop the development as soon as there is an indication of detail in the deepest shadows.

THE SOUTHAMPTON PROCESS.—J. CLARKE asks: "What is the peculiarity of the Southampton process for producing transfers? I refer to photo-zincography."—There is no peculiarity, inasmuch as it is one of the well-known methods of making transfers. Briefly, it is this: Thin paper is coated with gelatine and bichromate of potash. When dry, it is printed under the negative. It is then inked all over with transfer ink, and afterwards heated with warm water, which dissolves the unaltered gelatine, carrying the ink with it, leaving it only where the light has acted.

THE RULED SCREEN IN COPYING.—AJAX says: "I am much obliged for your reply to my query under the heading, 'Half-tone for Contact Printing. I am sorry to trouble you again, but will you tell me, Suppose I had to copy the enclosed print, would the use of a ruled screen give me a negative which would produce a better print than the original, i.e., would it break up the heavy shadows?"—Better make the experiment. Personally we have no experience with a ruled screen for the purpose. We should prefer to avoid the heavy shadows in the first instance, by a suitable lighting of the subject.



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## EX CATHEDRA.

ALTHOUGH it is in its third volume, we have only this month seen for the first time a specimen number of the *Photo Era*, an illustrated monthly, published at 185, Franklin-street, Boston, U.S.A. The magazine is very tastefully produced, and the illustrations and letterpress make a distinct appeal to those whose sympathies lean towards the pictorial rather than to the scientific side of photography. In common with several of its American contemporaries, the *Photo Era* protests against a recent English criticism "that the American photographic journals get steadily worse and worse." There does not appear to be sufficient scope in the States for journalism of the kind with which English photographers are familiar, but we have not detected signs of decadence in the American publications that reach us; indeed, they appear to us to be improving rather than otherwise, and the *Photo Era* materially strengthens the favourable view we take of American photographic journalism as a whole.

THE issue of our contemporary, the *Graphic*, for August 5 contains reproductions of some of the photographers that won

prizes in the competition recently held by that journal. Commenting on fashion in amateur photography, our contemporary acutely remarks that it often happens that some prominent worker makes a successful picture out of, say, a cottage door, with a sun-bonneted peasant standing within its portals. Thereupon dozens of amateurs will aim at the same type of photograph, and the exhibitions are flooded with such rustic scenes. Last year there was a run on marshy land and lowering skies, with such titles as "When the day's work is o'er" or "Eventide," or a line from Gray's "Elegy." In the present competition "Mutton" would have been an appropriate title for hundreds of the pictures sent in, for their leading feature was sheep and lambs. Sheep browsing, sheep sleeping, sheep being sheared, sheep bleating along the dusty highway, and the same necessary animals in every imaginable position and situation came to us in droves.

\* \* \*

ANOTHER circumstance gleaned from a critical examination of the pictures sent in for the competition, adds our contemporary, is quite a curiosity of amateur photography. It would appear that certain workers who devote their attention to landscape are not as ready as they might be to recognise a failure when it comes their way. "What we mean is that, when a picture by over-exposure or wrong treatment during development becomes blurred or fogged, it is not discarded, but is preserved as if the fault were really a virtue, and with a high-sounding title such as *A Misty Morning*, or *Through the Gloaming*, is sent in for competition with works which have no such flaw. Photographs of this kind have before now been medalled by Judges who had a hankering after impressionism without that technical knowledge of photography which would have helped them out of the error. This circumstance has encouraged many amateurs to treasure their spoilt negatives instead of smashing them, as they ought to have done." We assure the *Graphic* that its remarks on imitation amongst amateur photographers, and the false value often assigned to spoilt negatives, will find general endorsement in the photographic world.

\* \* \*

THE successful competitors were as follows: First prize, 20*l.*, W. Maclean, Belfast, for *Worn out*. The second prize, 10*l.*, goes to Mr. Charles F. Inston, of Liverpool, for a seascape



entitled *The Storm Lifting*, the third to Mrs. Wiggins, of Salem, Oregon, U.S.A., for a rustic subject with the title, *Hunger ist der Beste Koch*, and the fourth to Alfred Craike, of Upper Tooting, for *If I had a Donkey wot wouldn't go*. The three-guinea Kodak cameras have been awarded, in addition to those in the present supplement, to W. S. Anderson, of Helensburgh, for *The Mouth of the Gareloch*, to Dr. A. Mazel for his landscape, *Près Randa, Zermatt*, to Seymour Conway for *Exeter Cathedral*, to W. G. Hooper for *Looking for the Postman*, to Mabel Thompson for *Setter Puppies*, to J. Redhead for *Ennerdale Lake*, and to F. H. Gardner for *Hoar Frost*. The winners of the one-guinea Kodaks, other than those specified in the present supplement, are Colonel Taylor, Dr. Wilbiral, T. B. Miller, F. A. Joyner, A. L. Spiller, G. W. Harker, P. Gay, of New Zealand, Miss P. Rochussen (Switzerland), Sydney Spencer, Mrs. Main, Miss Tremayne, and Rev. R. C. Macleod.

THE *Rochester Herald* (U.S.A.) contains the following report of a United States Patent Office decision relating to the methods of preparing sensitive celluloid film: "In 1898 Mr. Henry M. Reichenbach received a patent for the manufacture of a sensitive film on sheet aluminium. Mr. Reichenbach's discovery, which dates from 1892, was the fact that the celluloid could be coated and dried on aluminium without corroding the aluminium or becoming itself contaminated therefrom. Not long after Mr. Reichenbach's patent was issued, which was early in 1898, Frederick H. Kelley, of Pawtucket, R.I., filed an application for a patent on the same grounds as those presented by Mr. Reichenbach and demanded an interference with the latter's patent. The case was vigorously contested on both sides. More than a year has been occupied in taking testimony and the presentation of briefs before the Patent Office. The decision now rendered awards priority to Mr. Reichenbach, and fully establishes the right of the Reichenbach, Morey, & Will Company to the control of the invention."

THE *Camera Club Journal* for August contains some excellent contributions by Mr. Cadett, Mr. Percy Lund, Professor Norman Collie, and Mr. Albert B. Lloyd—photometers for colour photography, Wordsworth, Canadian exploration, and adventures with pygmies, supplying a wide diversity of subject and very interesting reading. The editor has the following vigorous rejoinder to some infelicitous criticisms of the *Camera Club Members' Exhibition* which appeared in the first number of a new photographic publication, *Camera Obscura*: "The paper on the *Camera Club Exhibition* is a most careless contribution. We are told therein that No. 97, which is attributed to Mr. Beard, is a portrait, is 'deeply, darkly, dismally dreadful—a black blotteque shadow, slightly relieved by jaundiced high lights,' with further high-flown criticism, including a dragged-in quotation from De Larochefoucauld, as to all of which we may remark that No. 97 is not a portrait, it is not by Mr. Beard, and *Mr. Beard has not contributed any portrait work*. It is the old story of the apology made by a Mayor to Queen Elizabeth for not firing a salute. The critic also tells us, 'Mr. Craigie shows several of his somewhat low-toned portraits, and also his well-known *May Time*.' "This is all right as far as it goes," as our friend, Mr. F. Braine, occasionally recites to us, only we may be permitted to observe that Mr. Craigie exhibits

only two portraits, one of which is particularly rich in tone, and informs us that *he has never heard of the above-named picture*." The Editor of the *Club Journal* also sharply criticises an American publication for treating somewhat perfunctorily of hand-camera work, and thus the number, as we have already said, makes good reading.

### LAC AND ITS SOLUTIONS.

In an article on this subject which we recently published we did not make any reference to the well-known preparation lacquer—that is, the fine varnish, which has lac as a basis, used in all optical instruments as a protection to the polished brass-work. If it were not for this lacquer, so fine in texture and laid on so skilfully as to leave no trace of a varnish having been employed, our lenses and camera fittings would, in a very short space of time, become dull and dark—in fact, so dingy-looking as to suggest at once something "second hand;" instead of which a carefully used lens looks as new and fresh at the end of quarter of a century as it did when it left the maker's hands. This is entirely owing to the brass after being brought to a high state of polish being dexterously varnished over with the thin, clear spirituous solution of lac, the coating being so hard as to resist a considerable amount of abrasion and rough usage, and, almost infinitesimally thin as it is, forming a perfect resistance against atmospheric action. Bearing this fact in mind, our readers will at once see how the different colours known as characteristic of the brasswork of various makers' instruments may be attributed, not to the quality of the metal, but to the tint of the lacquer employed. We are led to make these remarks by the receipt of a letter from a highly esteemed correspondent asking for further particulars in regard to this particular liquid. "I read an interesting article on the subject of lac, seed-lac, and shellac in THE BRITISH JOURNAL OF PHOTOGRAPHY the other day, and, as I have been looking for some information on this very point lately it occurred to me that I would write to the Editor about it. . . . Up to a few years ago we were able to make an exceedingly good lacquer for our brasswork, the colour was peculiar, and was much admired for our class of work. . . . The last few years, however, we have had great trouble with our lacquer; in the first place, the druggists refused to let us have the spirit unless there was something put into it, and we had to get the lacquer made up by the druggists. Now, however, we have got a licence from the Excise people, in order to get the spirit ourselves, and yet we cannot get the same class of lacquer we got in former years. . . . Some twelve or fifteen years ago I tried a great number of experiments about lacquer, and used all sorts of colouring materials, but I found that, although I could get almost any colour I liked with suitable dyes, these colours were liable to fade. . . . I finally got the very best result by using nothing but seed-lac . . . a beautiful lacquer, just the colour we wanted. . . . I have tried various specimens of seed-lac lately, and can get nothing like the old result," &c.

Before solving this riddle, which we think we shall do readily, we should like to refer a little more in detail to the varieties of lac found in commerce. It is a rather singular fact, in connexion with an article of such importance as lac, that the literature on the subject should be so sparse and the facts so variously stated. It is known to be associated with the life history of a little insect. The insect appears in vast



numbers on the small twigs and branches of certain trees; the insects die after depositing eggs, and the twigs are found covered with an incrustation variously stated to be the dead bodies of the female insects, a secretion exuded by them, or an exudation from the tree caused by punctures made by the insects. This we may leave to be settled by experts. The incrustation is there, and the twigs which they cover are collected. These twigs are termed "stick-lac." Seed-lac is the name given to the incrustations after being removed and triturated in a mortar, with the double object of dissolving the colour out of them (which colour is the basis of the famous lac dye) and reducing the little lumps to small pieces. Seed-lac forms the principal ingredient in many of the older recipes for lacquer at a time when methylated spirit had not been devised. Now, unless the natives have invented factitious seed-lac, it is quite evident that seed-lac at the present time cannot be any different from what it was fifty or a hundred years ago, so that any difficulty in making lacquer must be sought elsewhere.

Incidentally let us describe the production of shellac. The seed-lac is collected and placed in canvas bags, which are heated sometimes before a charcoal fire, and at others over a fire. When heated to melting the bags are twisted, and the lac drops out. If received into water it forms "button lac." When smeared, so to speak, over the smooth surface of a portion of the plantain tree it hardens and flakes off in the form of shell-lac. This shellac is of various degrees of translucency and colour. The finest is known as orange lac, and its quality is gauged by its glass-like transparency and the lightness of tint. The poorer qualities, as before described, are called "ruby," "garnet," &c., according to the depth of colour. "Lump-lac" is simply a melted agglutination of seed-lac. We have thus a complete key to the colour, and an explanation of the preference given to seed-lac. It is unaltered by the hand of man, and so possesses the virtues of gum-lac in the highest degree, and is accompanied by a portion of the original colouring matter, which is nothing but the well-known lac dye, one of the fastest of red dyes—the material used for dyeing the best quality of the soldiers' "red coats." The old lacquer makers preferred to modify and deepen this colour by adding various vegetable colours, notably gamboge, annato, saffron, and very frequently aloes. Many makers added sandarac or other gums to their lacquer to add to its brilliancy, though we are inclined to think that any addition whatever reduces its resistance to mechanical injury.

There is then only the solvent left to consider, and here we do not doubt the key to the mystery is to be found. Our correspondent is probably unaware that the methylated spirit of to-day is different from that of a dozen years ago. The new kind, as we have often stated, is made by adding a light petroleum oil to ordinary alcohol, the mixture being incorrectly termed "methylated." This name is only truly given to the old kind. The addition to the alcohol in that kind consisting of methyl alcohol, known also as wood spirit, wood naphtha, pyroacetic spirit, &c. If our correspondent will ask the Inland Revenue authorities to revise his licence and alter it to a permission to use the old kind of methylated spirit, we think all his difficulties will vanish. With regard to the solvents, there can be no doubt that something beyond a mere solution of the lac is needed, for it is well known that the users of French polish prefer either all wood naphtha, or at least a large proportion of naphtha in the liquid they use. Finally,

we append two very old and tried recipes for lacquers of different colours, which we know were in use more than half a century ago:—

Shellac.....	120 parts.
Sandarac .....	45 "
Mastic .....	30 "
Amber .....	30 "
Black resin .....	90 "
Dragon's blood .....	30 "
Turmeric .....	30 "
Gamboge .....	30 "
Rectified spirit .....	1000 "
Shake occasionally till dissolved and strain.	

Seed-lac .....	120 parts.
Gamboge .....	120 "
Dragon's blood .....	120 "
Saffron.....	30 "
Rectified spirit .....	1000 "
Put in a hot place, stir at intervals, and filter.	

**Celluloid Again.**—Evidently celluloid is not gaining in repute so far as safety is concerned. Last week a fire occurred at a celluloid factory in the Rue de la Folie, Méricourt, Paris, at which three firemen and one of the workmen were seriously injured and much damage was done to surrounding property. The extremely hot weather is said to be responsible for the fire. It is a little difficult, however, to see how the hot weather, hot as it has been in Paris, as everywhere else of late, could be the cause of the fire. Celluloid, as we all know, is exceedingly inflammable, but it wants a strong heat to ignite it, and it is not liable to spontaneous combustion, even when submitted for a long period to high atmospheric temperature. When accidents have happened with celluloid films at cinematograph exhibitions, the cause has generally been through a flame carelessly being allowed to come into contact with the film, or from its being permitted to remain too long exposed to the great heat of the condenser. We should say that, *per se*, the hot weather had nothing to do with this fire, and that celluloid should not be credited with it.

**The Observatory at Ben Nevis.**—Last week we referred to the closing of this Observatory because the Meteorological Council would not, out of its grant of between 15,000*l.* and 16,000*l.* a year, allow 500*l.* a year to keep it open, and the questions put in the House of Commons with regard to it. The question has since once more been raised in the House with reference to the way the sum granted to the Meteorological Council is expended and pointedly criticised. It was said that the Council took nearly 1000*l.* for managing the grant, while the Secretary also received 800*l.*; also that a sum was being annually set aside by the Council in order to provide for a superannuation fund which now amounted to 2000*l.* It was also stated that 3000*l.* had been sunk in the Ben Nevis Observatory, and that the benefit accruing to science from the expenditure of such money would be probably lost if the cycle of observations were not completed. Mr. Balfour, in reply, said that the Government have no information as to the details of the expenditure of the Meteorological Council except such as may be derived from its report. In reply to further questions by another Member, the First Lord of the Treasury said, "It is not for me to say whether the Meteorological Council does or does not carry out the functions intrusted to it to the best advantage." That may be so, but the public directly or indirectly have the right to know, particularly the scientific portion of it, as they are perhaps the most interested in the matter. An investigation into the grant to the Science and Art Department revealed something, and similar investigations in other departments might lead to good results.



**The National Portrait Gallery.**—During the past week several questions have been put in the House of Commons of more or less interest to our readers. One of them was with regard to three portraits that are for sale: portrait of the Queen in her robes of state, by Sir David Wilkie, R.A.; portrait of King Charles I.; and one of Queen Henrietta Maria, which may be had for the small sum of 3159*l.*, and which had been declared by the Trustees to be of great historical importance and their acquisition a great benefit to the nation. In reply to this, the Chancellor of the Exchequer said that he understood that the Trustees of the National Portrait Gallery do not now desire to purchase the portrait of Her Majesty the Queen referred to; and, as to the other pictures, he did not think there was a sufficient ground for a special grant for their purchase. Subsequently a question of similar import was put a few days later, and a somewhat similar reply given. It would seem, from the questions put and the replies given, that the Trustees of the National Gallery and those of the National Portrait Gallery are not quite working in unison, which is to be regretted.

By the way, why should a National Portrait Gallery be entirely confined to paintings, and then only if they are really works of art by the finest masters? One would have surmised that in a National Portrait Gallery portraits, good and characteristic likenesses, of distinguished individuals should be the chief consideration, whether strictly works of fine art or not. If this were the case, why should not photographs, by either of the two permanent processes, carbon and platinotype, find a place in it? Of many eminent men of national interest there are no paintings, by eminent or other artists in existence, or, if there are, their families would not part with them; but there may be excellent photographs of them. Why should not room be found for photographic portraits, say enlargements in carbon or platinum, from such photographs as are available? When one wishes to see portraits of eminent persons, they want likenesses of them rather than works of art by great masters, which, by the way, are not always good likenesses.

ANENT this subject, it is announced that the Queen has presented to the National Portrait Gallery a portrait of herself, in the robes worn at the Coronation, painted by Sir George Hayter, which is now in the Kensington Palace. This will certainly be an acquisition to the Gallery, though it is said that it is not possible to make arrangements for the immediate transfer of it from Kensington to Trafalgar-square.

**The Paris International Exhibition.**—In the votes in supply in the House of Commons, last week, was one of 60,000*l.* for the English section of the French Exhibition of 1900. This was passed without opposition or comment. It is to be hoped that photography, in all its branches, will be well represented. In previous international exhibitions in the gay city, English photography, in its multifarious phases, has not figured at its best, and it is desirable that it should next year, particularly when it is remembered that the most important discoveries and processes in connexion with photography must be credited to this country.

**The Vandyk Exhibition at Antwerp.**—In our last issue we referred to the Vandyk Exhibition, which opens on the 12th inst. to commemorate that famous artist's tercentenary, and the opportunity that tourists in Belgium will have for hand-camera work at the pageant through the streets prior to its opening. On a former occasion we have mentioned that Her Majesty the Queen owns, in her private collections at Buckingham Palace and at Windsor, some of the finest Vandyks in this country, which the public are made familiar with through the photographic reproductions of them by Continental photographers—Hanfstengl and Braun, for example. We now learn that Her Majesty has lent some of these fine works to the Antwerp Exhibition; amongst which are the half-length of

Charles I., from the Windsor collection; the famous picture (small whole-length) of the children of Charles I., the Duke of Devonshire (whole-length), and several others. Vandyk's work was almost entirely confined to portraiture, and it is well worth the study of portrait photographers—more especially the younger members of the profession.

# NIÉPCE AND DAGUERRE.

*The Bulletin della Società Fotografica Italiana* publishes a facsimile of the agreement entered into by Niépce and Daguerre. The following translation of this document may interest many of our readers:—

## BASIS OF PROVISIONAL AGREEMENT.

"The undersigned M. Joseph Nicéphore Niépce, landowner, residing at Chalon sur Saône, department of the Seine and Loire, of the one part, and M. Louis Jacques Mandé Daguerre, artist painter, Member of the Legion of Honour, and Manager of the Diorama, of the other part, hereby enter into the following provisional agreement for the purpose of founding a partnership:—

"Whereas M. Niépce has made certain studies for the purpose of recording the views of nature by a new method without the aid of a draughtsman, and various experiments constituting this discovery have been the result. The said discovery consists in the spontaneous reproduction of pictures formed in the camera obscura. And whereas M. Daguerre, to whom the discovery has been made known, perceiving its great interest and the great improvement of which it is capable, has offered to join M. Niépce for that purpose, and for securing all the benefits which may be derived from this new kind of industry: In view of these facts, the parties hereto have agreed to the following provisional and fundamental conditions of partnership:—

"1. A partnership shall be formed between MM. Niépce and Daguerre, under the commercial style of Niépce-Daguerre, for the joint purpose of perfecting the said discovery made by M. Niépce and improved by M. Daguerre.

"2. The partnership shall be for the term of ten years, dating from this fourteenth day of December, and prior to the expiration of that term shall only be dissolved by mutual consent. In case of decease of either of the partners, his heir shall succeed to the partnership for the remainder of the unexpired term of ten years. Further, in the event of the decease of either of the partners, the said discovery shall only be published under the joint name specified in clause 1.

"3. Upon signature of this agreement, M. Niépce shall disclose to M. Daguerre, under the seal of secrecy, which shall be so kept under penalty of all expenses, damages, and interest, the principle upon which the discovery depends, and shall furnish an exact and complete written statement of the nature, the working details, and the different modes of applying the processes connected therewith, in order that the experiments for perfecting and utilising the discovery may be carried out as completely and quickly as possible.

"4. M. Daguerre, under the same penalties, undertakes to preserve with the greatest secrecy the fundamental principle of the discovery, and the nature, the use, and application of the processes which shall be disclosed to him, and will co-operate, as far as possible, in the improvements which may be deemed necessary to the best of his abilities and talents.

"5. M. Niépce gives and cedes his invention to the partnership, as an asset, in consideration of half the profits which may be derived from it, and M. Daguerre contributes a newly designed camera, his talent, and his industry in consideration of the other half of the said profits.

"6. Upon signature of this agreement, M. Daguerre shall disclose to M. Niépce, under seal of secrecy, which shall be so kept under penalty of all expenses, damages, and interest, the principle upon which the improvement in his camera depends, and will furnish an exact written statement of the nature of the said improvement.

"7. MM. Niépce and Daguerre shall contribute in equal shares the capital which may be found requisite for the partnership.

"8. When the partners think it desirable to apply the said invention to the process of engraving, that is to say, when they have decided what advantages it may possess which would enable an engraver to make a trial plate, MM. Niépce and Daguerre hereby agree to select no one but M. Le Maître for carrying out the same.

"9. Upon execution of the final agreement, the partners shall mutually appoint a manager and a cashier of the firm, which shall be located in Paris. The Manager shall conduct the business as decided by the



partners, and the Cashier shall receive and make all payments as ordered by the manager in the interests of the firm.

"10. The Manager and Cashier shall be elected for the term of the present agreement, but shall be eligible for re-election. Their services shall be gratuitous, or a portion of the profits may be awarded them, as the partners may think fit, when the final agreement is made.

"11. The Cashier shall render an account to the Manager each month, showing the position of the firm, and every six months the partners shall divide the profits, as stated above.

"12. The Cashier's accounts, showing the position of affairs, shall be balanced, signed, and attested each half-year by both partners.

"13. The improvements which may be made concerning the discovery and the improvements in the camera shall be the property and for the benefit of both partners, and, when they have attained the object in view, they shall make a final agreement upon the basis of these presents.

"14. The net profits of the partners derived from the firm shall be shared equally between M. Niépce, as inventor, and M. Daguerre for his improvements.

"15. Any dispute which may arise between the partners concerning this agreement shall be decided by arbitrators appointed by each party privately, according to Article 51 of the Commercial Code, and their decision shall be binding, without appeal or revocation.

"16. If it should be decided to dissolve the partnership, the liquidation shall be undertaken privately by the Cashier, or by both partners together, or by a third party, to be appointed privately, or by some person appointed by a competent Court at the instance of the more active partner.

"The whole of this agreement has been entered into provisionally by both parties, who, for the execution of these presents, elect as domicile their respective residences, as specified above.

"Executed and signed in duplicate at Chalon sur Saône the fourteenth day of December, one thousand eight hundred and twenty-nine.

"Approved by me, though not written by my hand,

"J. N. NIÉPCE.

"Approved by me, though not written by my hand,

"DAGUERRE."

#### SIMULTANEOUS DEVELOPMENT AND FIXATION OF GELATINO-CHLORIDE PAPER.

HERR R. E. LIESegang points out 'in Camera Obscura' that if gelatino-chloride paper is faintly printed out under a negative, and be then placed in a bath which fixes it and at the same time develops it to full intensity, the only other operation would be the necessary washing afterwards. It is, moreover, not necessary to print to a given depth. The combined developing and fixing bath contains no gold salt; and, further, the bath is alkaline, so that sulphur toning is absolutely impossible. Although his experiments are not quite complete, he publishes the statement in order that others may try it.

In 1893, he had observed that a gelatino-bromide plate which was fixed immediately after exposure could be physically developed; \* for instance, with silver nitrate, hydroquinone, and sodium acetate. Experiments made at the time lead him to conclude that gelatino-chloride paper could also be simultaneously developed and fixed.

Some experiments, † in which fixation was attempted, not with hyposulphite of soda, but with the sulphocyanides, were without result; and even the addition of an alkaline dry-plate developer to the hypo bath caused no blackening of the exposed parts. The desired result he has now obtained by adding silver nitrate to the bath. But even a mixture of silver nitrate, hypo, and a developer such as is used for dry plates, worked only very slowly, the print had to be left in it at least the whole night. A developer which would give the print the necessary vigour in a short time was only formed when amidol and caustic potash was added to the solution of silver nitrate and hypo. The print first fixes in it, and then in about a quarter of an hour attains the necessary depth. The disadvantage that amidol, pyro, &c., lose considerably in developing power by the addition of a large quantity of hypo is very noticeable. The accelerating action which the addition of small quantities of hypo exerts in dry-plate development does not lead one to expect this. If amidol is mixed with an alkali, the red and blue oxidation products are very quickly formed. In the presence of hypo this does not take place; pyro even does not colour so quickly. It is even pos-

sible to decolourise a deep blue-coloured mixture of amidol and alkali by the addition of hypo. The bath used consists of—

Sodium hyposulphite .....	31 parts.
Water .....	150 "

This is mixed with—

Silver nitrate .....	3 parts.
Water .....	100 "

The precipitate first formed readily dissolves by shaking, and then there should be added—

Amidol .....	1 part.
Sodium sulphite .....	5 parts.

When solution is effected, add as much ten per cent. solution of caustic potash solution to make the solution slightly greenish; about twenty-five parts will be necessary. This bath is suitable for the development and intensification of dry plates.

#### FOREIGN NEWS AND NOTES.

**A New Anastigmat.**—M. Lacour, of Paris, has just completed a new lens, which he calls the anastigmatic eurygraph, which is composed of two symmetrical combinations, each being composed of three glasses, and perfectly corrected. The lenses are thicker at the sides than in the middle, thus recalling the concentric of Messrs. Ross & Co. The full aperture is about  $f/5.3$ , and at this aperture a lens of 14 l. cm. focus ( $=5\frac{1}{2}$  inches approximate) will cover sharply a plate of 11 x 15 cm. ( $=$  half-plate approximate). The single combinations will cover a  $7\frac{1}{2} \times 5$  inch plate at  $f/10$ .

**Silver Stains.**—Herr Weiss, of Vienna, states that, if a negative which has become silver-stained by contact printing with silver paper be immersed in a solution of yellow [? red.—Ed.] prussiate of potash, and then treated with a hydroquinone developer, they will be totally removed, and the negative not be reduced in density.

**A Simple Sensitiser.**—M. Niewenglowski suggests the following method of preparing a one-solution sensitiser, which may be applied to almost any material without any preliminary preparation if it be fairly well sized:—

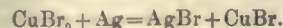
Distilled water .....	10 parts.
Silver nitrate .....	3 "
Uranium nitrate .....	30 "
Absolute alcohol to .....	100 "

Apply the solution with a brush, allow to dry in the dark, which takes about ten minutes. Expose in contact with the negative, and fix by immersion in two or three baths of water acidulated with nitric acid, and then rinse in plain water and dry. It is advisable, if very rich tones are required, to dry in front of the fire or iron with a hot flat iron.

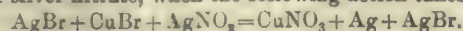
**Intensifying Collodion Negatives.**—M. Fery suggests the use of cupric bromide, followed by silver nitrate, and then by a hydroquinone developer, for intensifying collodion negatives. The negative, which should be thoroughly washed, is to be immersed in a solution of—

Cupric sulphate .....	25 parts,
Potassium bromide .....	25 "
Water .....	1000 "

till bleached. The action of this is the formation of cuprous and silver bromide:



After washing, the negative should be immersed in a two per cent. solution of silver nitrate, when the following action takes place:—



The silver bromide formed in the first bath remains unaltered, but the cuprous bromide forms more silver bromide. The plate should then be washed and treated with the following:—

Hydroquinone .....	10 parts.
Sodium sulphite .....	75 "
" carbonate .....	150 "
Water .....	1000 "

This reduces the silver bromide to the metallic state, and gives a density twenty-seven times greater than the original without blocking up any of the fine details.

\* Photo Archiv (1893), p. 67.

† Photo Archiv (1893), p. 28.



**Another Snap-shot.**—The following storyette appears in one of our foreign contemporaries, and it may or may not be true. An artist's model was standing at the corner of one of the streets in Paris, waiting for some of her companions, and "fourra nerveusement l'index de la main droite dans le nez," when she espied an amateur taking snap-shots of her from the second-floor window of an opposite house, and, disgusted at being taken at such a moment, she loudly upbraided the inconsiderate camerist, and the two were promptly hauled before the inspector of police of the quarter, when the grisette explained that, as she was an artist's model for heads, and received 10 francs per sitting, she strongly objected to be photographed without her express permission. The amateur pleaded that he was merely taking a snap-shot of the corner of the street, but gallantly opened his camera, allowed the sensitive model to smash the sensitive plates, and she departed satisfied to her work.

**Dr. Vogel's Successor.**—Dr. Adolph Miethe, the well-known photographic writer and expert, has accepted the appointment of the professorial chair rendered vacant by the death of Dr. H. W. Vogel, at the Technische Hochschule, Charlottenburg, Berlin.

**Artistic Results.**—Ritter von Schöller, of Vienna, states that he has obtained excellent results by using Liesegang's old iodine paper, which can be very easily prepared as follows: Into a solution of—

Potassium iodide .....	10 grammes,
Potassium chloride .....	40 "
Water .....	1000 c. c.
Lemon juice .....	250 drops,

are placed 20 grammes of tapioca which have been allowed to soak in cold water for one hour, and the excess of water poured off. The mixture is now heated to boiling, and well stirred until the solution becomes quite clear, and it is then allowed to cool, and then paper of the desired surface is coated with this by means of a brush or swab of cotton-wool, and allowed to dry. The paper in this condition will keep for any length of time. To sensitise this, it should be floated or painted over with a solution of—

Silver nitrate .....	60-100 grammes.
Citric acid .....	5 "
Water .....	1000 c. c.

The more silver used the more brilliant the prints. The paper, when dry, is exposed till the details are distinctly visible, and the print is then placed in a developer of—

Gallic acid solution (saturated) .....	1 part,
Water .....	4 parts,

till the desired vigour has been obtained, when it should be well rinsed, and fixed in a ten per cent. solution of hypo. Charming black and brownish tones are thus obtained.

## RETOUCHING.

[Paper read before the Royal Photographic Society.]

THERE are many who cannot or will not recognise the legitimacy of this art in its association with the science of photography. I can scarcely think this fair, as, however much amateur photography may be independent of retouching, professional portrait photography is commercially very much dependent upon it for success. I do not wish to insist upon retouching being the chief point, but I do insist that it is an essential one, in the production of successful portraiture. The retoucher should work in closest sympathy with the operator, and help him to carry out the artistic notion to which he first gives existence in the shape of a negative. The retoucher necessarily comes second, as the negative in the first instance must be the operator's production. I consider retouching a natural offspring of the simple process of development, for it is in a manner a process which enables the operator to accomplish the very difficult task of intensifying the negative in certain minute parts where intensification is necessary—an operation which would be quite impossible by ordinary chemical treatment in the usual way. The process first adopted for carrying out retouching was a very rough-and-ready one. The operator in most cases usually worked out the blemishes with water colour, some manipulators using one tint and some another.

The very earliest colour used for this purpose was, I believe, blue; then followed neutral tint, Payne's grey, and kindred tints, until finally the lead pencil took a firm hold, to the complete exclusion of all other means. Its working was easier and more convenient, to say nothing of its greater reliability, the actinic properties of the deposit being more easily and justly appreciable than those of any vehicle employed in any of the other methods formerly in use.

Retouching was first introduced in the old wet-plate days, and, to a few of the more advanced and up-to-date workers in photography about the middle of the century, proved the means by which big positions in the profession were secured, as well as enabling them to considerably inflate their banking accounts. In those days it was the custom to stipple out the blemishes with blue or neutral tint, as I have already stated, and thus to build up the defective parts of the image so as to produce a more pleasing picture than would otherwise be obtainable from the untouched negative. Of course, there was but small scope for variety of method or treatment in the working of this style, as the most natural and easy means of applying a flowing colour to a plate so highly sensitive to moisture would be to stipple the same on with a moderately dry brush. With the adoption of the lead pencil for retouching, however, all this was very much altered. There was imparted a greater variety of possibilities, to be limited ultimately only by the artistic feeling of the artist carrying out the work. This limitation, I am sorry to say, is but very ill-defined, and seems to be shifted about in the most reckless manner to suit the temperament of the artist, or of the photographer by whom he is employed, or the whim of the customer. It is much to be desired that a definite limitation should be fixed, and a positive theory adopted from this standpoint as to what good retouching really means.

I regret that there seems to be such a divided opinion as to what is and what is not the correct way to carry out this interesting work, as also to what extent that work may sensibly and artistically be carried. As I say, limitation is but very ill-defined, and to add to the general confusion the various writers on the subject have laid down divers and contradictory methods as being the only correct ones to be used in the working. The "cross-hatch," the "dot and tail," and the system of touches resembling the letter "S," are all set down as the best or only stroke or touch which can produce artistic retouching. These touches are all very good and nice in their way, and will give very charming and pretty effects; but I cannot see that the results are quite artistic, nor are they at all natural or calculated to produce sound portraiture. I have always held that retouching is not such a poor art as to be run on such narrow lines; and I have always endeavoured to uphold that there should be no such thing as a regulation touch, but that, on the contrary, there should be perfect freedom in the use of the pencil in taking out or modifying a blemish or altering an expression. I always desire to believe that there is more virtue in the intention of the artist than in any peculiar mean she may use to express it. Such touches may be very well now and again, when they suit the blemishes, but I think it a folly to lay down a regulation touch as the sole and only manner in which artistic work should be carried out unless they order the blemishes, &c., to be made to suit them. If portrait painters adopted such a method as this, what a fine show our National Portrait Gallery would present (?) We, however humbly, should follow the example of our betters, even if at a very respectful distance—it will always do us good. I fail to see that any artistic feeling is possible in "regulation" work, except it be accidental, but assuredly there is no common sense. I would submit this point for your consideration. If a blemish be of some particular shape, why should we cover it with a tissue of marks of a different shape? The shape and quality of a touch should be entirely governed by the shape and quality of the blemish; neither should our touch, however free from mannerism, be too positive and defined, as this will tend to destroy the quality of the skin (as is the case in the mechanical touches before referred to), and I may say that in my humble opinion the skin is a very important factor in any portrait. Regulation touches will give you what is called texture, or grain, but they will not give skin; and the point to be considered is, Do we prefer texture, or do we prefer skin? In the prevailing methods of working negatives little attention, if any, is paid to this matter—no thought, no brains. All heads are touched in the same way; strong men, weak men, old ladies and young ones, and even children, are all treated alike—there is only one skin on top and all must have it, be it natural or not. Now, this system of smoothing—for it is nothing else—is so generally adopted that there is no very distinctive difference between the work turned out by our first-class London houses, at enormous prices, and the moderate-priced work of our falsely designated "second-rate" country photographers. Is it wise that this should be so?

Let us examine this smoothing-up process for a moment, and see what a foolish thing it really is. Delicate detail, fine modelling, artistic light and shade, are all difficult qualities for the operator to secure, and yet the retoucher is allowed to quietly sweep them away, and for what purpose? simply to gain that polished surface which is so dear to him, and which with so many passes as the acme of good retouching. See if there be any life in the faces; are they not cold, hard, and in most instances expressionless and uninteresting? I think, however, you will find that there are many who yet consider them very good work, notwithstanding the fact that nothing short of a most impressionable imagination will be able to trace in them the least resemblance to the



originals. Of course, we can always assure ourselves that it is a certain portrait by examining the watch-chain, the neck-tie, or some other article by which the identity can be established and so the face can be done without. But is this as it should be? I think it may safely be said that ladies are more susceptible to undue flattery than are men. That being conceded, it is only fair to say that when men are open to flattery they will go a considerable distance to secure a record; in fact, I know examples that would make us all blush for our sex. In my own experience the complete alteration of a nose is but an ordinary affair, but I have also had to improve the symmetry of a gentleman's back, when increasing weight and years had somewhat marred his former beauty. But we will pass these over as the exceptions that prove how sensible we ourselves would be. What we ought really to consider is, Should we not be more judicious in our flattery, and use greater skill and thought in carrying it out? I feel sure that, if a better standard of opinion were established on this point, an all-round good would result, alike to the retoucher, the photographer, and the general public. One would not so often see, and hear it said (unfortunately with a very large degree of justice) that the best likeness of Mr. or Mrs. So-and-So was taken by an amateur friend, in his back garden, the only apparent reason being that, although the portrait is much worse from a purely photographic point than those taken by professionals, it has not been retouched. Examples of this kind crop up almost daily; I find very often that, when a death occurs, in nine out of ten cases amateur photographs are sent to me for copying or enlargement in preference to the ordinary studio picture, on the ground that "it is such a good likeness," although the negative is in all other respects a very bad one. Experience—and I have had a fair share of it—has always been full of object lessons, and I have always tried to gain instruction from them as I have struggled along, and I am just as open and willing to learn some point this evening as I was twenty-five or more years ago. Believe me, we should all live and learn, and I hope it may be long before any of us cease to do either. The moment we cease to learn and hope to improve, retrogression sets in, and we may rest assured that conceit, that most objectionable of qualities, will soon take firm hold of the victim, and ruin his or her future.

If my objections to the fallacy of regulation methods of retouching, as popularly laid down, be true as regards their application to professional portraiture, how much more so must they be when applied to amateur work and to other branches of the art science? Amateur work, taken under all conditions of light and in the face of many difficulties, should never be treated by the retoucher as within the same narrow limits which may be more or less sufficient for professional studio work, a fact which I have no doubt you have all observed.

How much more truly must all this apply when we attack the other branches of photography, such as landscape and architectural work. Retouching can be very largely employed in these interesting branches, and here again the healthy and untrammelled use of one's brains comes in with even greater advantage. To remove blemishes is but an item in the work we do; often it is possible to add an effect of light or shade which is not in the negative, or to emphasise an effect which, although indicated, is not powerful enough to assert itself. It is only during the past few years that I have been called upon to treat architectural and such kindred subjects. At first I scarcely knew what to do with them, unless I found an unhealthy lot of blemishes staring me in the face, but I at once reflected and realised that the subject was well worth studying up. I therefore started buying engravings, of which I have now many hundreds, and from them learned how to make a picture of interest of a photograph almost devoid of beauty, with ample technical detail but no artistic balance of light and shade. With engravings before one, taken from the best point of view, inside or out, of the various edifices noted for their beauty and grandeur, one can find ample food for reflection and a chance for some good work. The originals of these engravings were not only sketched from the best points of view, but they were finished by such giants in the handling of light and shade as William Henry Bartlett, Allom, Roberts, and Prout, and they are invested with all the beauties of that artistic balance of which these artists were such rare masters. The photographs one has to treat may probably have been taken from the same, or nearly the same, standpoint, but how about the artistic effect of light and shade? The enthusiastic and artistic photographer must have full credit both for knowledge and artistic feeling, but, be these qualities ever so great, he cannot command the light to his wishes and can only take the view as the light will let him. This is no fault of his, for, struggle as he may, he cannot get what he originally hoped for, and must be content with whatever image he may secure on his plate. Now is the time when we as retouchers can second his efforts and help him to procure those effects which he had hoped for but found impossible to secure. By washes of colour, papering the back of the negative, stumping in lights, &c., we help him to secure a success. This should really be considered as part of our art, and the student should pursue it still further for instruction, as I do, by making a study or a hobby of restoring engravings and mezzotints. I promise you, you will find such work most enjoyable, as well as instructive. Working in this way, one naturally trains the eye until one acquires a most sensitive feeling for artistic beauty which will be invaluable to us, to say nothing whatever of the attendant pleasures of the occupation.

I have often wondered why amateurs, and especially ladies, of artistic

taste, have not gone in for retouching more seriously than they have done. I cannot think that it is owing to the little difficulties which beset the path of the beginner. No, I think it is more traceable to the fact that the teachings on this interesting subject are such as to shut out the artistic opportunities which alone would induce the better class of amateurs to undertake the trouble of learning. I know cases of ladies who have so-called beautiful photographs, and who have yet declared that they had not a likeness of themselves which they would leave to their family. There is a lot of money waiting for the amateur or professional photographer who would supply this want—a good photograph and a good likeness. Another question worth pondering over is, Can a bad likeness be looked upon as a good photograph? A discussion on this point might result in a real benefit to our photographic portraiture as represented by the photography of the day.

At the conclusion of his paper, Mr. Barrett invited the members present to submit prints to him for friendly criticism, with a view to some understanding being arrived at upon the question as to what is good retouching, but, there being no response, he continued:

Let us take as examples the portraits of the fathers of photography, upon the walls of this room. The majority of them were, no doubt, taken in the days of more or less untouched negatives, but I do not think the Society would care to have them replaced by photographs in the present style. Surely a medium between present-day work and the old style would be a much safer line to work upon than the one plan of continual smoothing. Some years ago I saw a 15 x 12 group of a lady and gentleman and a child, taken by a leading photographer, all the faces having the same touch; I did not consider that good—certainly it was not thoughtful, for there should have been differences in the texture of all three. I have found that the negative itself holds a certain impression of the real skin; i.e., that there is the texture of real skin in the negative if we in retouching do not make our touches so vivid and aggressive as to destroy it. I can retouch a good many large heads in a day, but I could not do so if I did not make use of the negative itself; and where the negative prints fairly white I do not encumber it with much retouching. I think, too, that in retouching a great deal of attention should be given to the improvement of expression. It very frequently happens that a sitter gets an unfortunate expression quite unlike that which is natural to him, but the slightest possible amount of work on the negative is sufficient to remove it and to produce a pleasant and natural likeness, and it can be done by any one who will take the trouble to think. The people who learn retouching are not sufficiently taught the importance of training themselves to think; they are taught to do, but there is really very little to do—most of it is *thinking*—thinking how very little pencil will make a successful picture.

The President agreed that the great objection to modern retouching arose from the fact that so little thought was devoted to the work. In using a wax head for making experiments in lighting he got something approximating to the appearance of the highly retouched portraits exposed for sale in shop window, a result quite unlike skin and devoid of expression. Another cause of the unsatisfactory nature of retouched photographs was that the retoucher gave his idea of what the face ought to be rather than what it actually was, and this was almost unavoidable unless he had an opportunity of studying the original.

Mr. Barrett continued, answering one or two questions which were interjected in the course of his remarks. The beauty of every head consists in its expression, and more success is gained by attention to that detail than by working up what is called a beautiful finish. I think ladies would be much better pleased with their photographs if their expression were properly rendered—with, perhaps, a reasonable amount of flattery—than with portraits in which everything is carefully smoothed out for the sake of "finish." Youth can be partially restored without burlesquing the original; there are certain faces that will admit of flattery without losing the likeness, but there are others which will not stand it without becoming grotesque and unpleasant to those who know the sitter. The medium which should be aimed at is the point which will produce a successful portrait and at the same time a pleasing likeness; it can only be arrived at by limiting the amount of work as much as possible, for the more pencil you put on the negative the more likely are you to lose the likeness. The degree of hardness of the pencil employed depends largely upon the peculiar touch of the user; personally I prefer No. 3 lead, a very safe pencil with which almost anything can be done. With a hard pencil there is a tendency to increase the quantity of work, and consequently to overdo it. With a No. 4 it will perhaps be necessary to make two strokes to produce the effect of one stroke with No. 3, and with No. 5 three or four strokes may be required, and that is dangerous; but one delicate touch with No. 3 will give the full amount of deposit and obviate the risk of over-working. A good method is always to take out the major blemishes first. It will be found that the blemishes occur, as it were, in series or rows; take out the glaring ones first, and then the second row will appear to be pretty bad—take those out next, and you will find that very little remains to be done. Do not continue touching and touching the negative until it will take no more lead, but be satisfied when the blemishes are gone. If the negative is to be printed on a high-surfaced paper, the touch should be finer and softer than when platinum prints are required; I can retouch a large head for artistic effect in platinum printing in a very short space of time, but quite double would be



necessary for silver printing. Freckles present no difficulties and may be looked upon as the front row of blemishes, and as a guide for the rest of the work. The object in removing a blemish should be to destroy its shape, not to fill it up, which is ruinous to the photograph, because by filling it up you produce white and thereby loss of colour, a quality most essential to a good picture. Where the pencil touches the negative for the first time the deposit should be greatest, and from that point to the finish of the touch, it should become lighter, so that the end of the touch is simply the little bit that knits the work together. The severity of the expression of a man's face can always be softened, but the retoucher need not go so far as to put a laugh on the face of a man who never smiles. Ability and beauty do not always go together, and the retoucher should not take the brains out of a man of great ability, leaving him nothing to show his claims to be above the average. Where a man is the possessor of considerable ability there are always indications of it in his face; yet he may have no pretensions whatever to beauty. Now, in trying to make such a man beautiful or even good looking, we will surely deprive him of his undoubted ability, and fail in producing a good portrait. The late Mr. Gladstone was an example of what I mean; what would his portrait be without the wrinkles? Half the people who learn retouching are not taught to think; I invariably make my pupils think for the first six lessons, and then they can almost do for themselves. There never has been a portrait negative so perfect that a small amount of retouching will not improve it, and the great object should be to know when to leave off; nature has colour to help her, but photography has only black and white, and, if a line is too harsh or too cold, a very small amount of modification, as in the lines under the eyes, will often be of material assistance in reproducing the effect of nature upon the eye of the observer. The necessity for retouching arises primarily from the fact that the colour of the skin is made up of minute particles of different colours so blended that to our eyes they appear to be one colour natural to the skin, but in the photograph there is a differentiation between them which it is necessary to some extent to remove. The removal is done by means of retouching to the necessary extent, and that is not very far. A mistake is often made in retouching the shadow side of a face, making it appear full, perhaps while the lighted side is thin and sunken; it should be remembered that the slightest touch on the shadow side has twice the importance it would have on the other side, and that all the well-indicated features should be kept. For publication work over-retouching is more acceptable, because people buy photographs of actresses and professional beauties simply because they are pretty, and not because they are good likenesses; but with well-known public men and men of learning and intellect flattery is ruinous, because we really want likenesses of them and do not care whether the portraits are pretty or not. The question of retouching landscape and architectural photographs brings in some different considerations; I think the printing in of a sky or a foreground is quite justifiable, but here again there is not sufficient thought exercised. How often do we see a sky that does not approximate to the effect of the water in the foreground, or that does not coincide with the lighting of the landscape. But there are frequently points in a landscape where a deepened shadow would add a value or where the infusion of transparency would materially benefit the picture. This sort of work cannot be so well done by the pencil as by a stump of a brush, for the touch of a pencil is antagonistic to somewhat broad effects, and it must therefore be accomplished by washes of colour, or by paping the back and using the stump where required. The same remarks apply generally to architectural work, where the deepening of a shadow often relieves the rest of the picture and more perfectly renders the idea of distance. I do not think that the insertion of a line of a beam in a roof, for instance, would catch the eye more than would be the case if the actual beam had been photographed, providing the work was properly done; and I think it would be justifiable to give the effect of a ray of sunlight coming through a window, or any other natural effect, that could have been secured in the negative by patient waiting or under certain conditions. In architectural work, as in landscape, breadth of light and shade is the object in view, and therefore a wash of colour is more satisfactory than the pencil, which is better adapted to the rendering of minute detail.

Mr. Snowden Ward, referring to the value of retouching on architectural subjects, said he believed it was an open secret that some of the wonderfully fine interiors shown at recent exhibitions of the Society were from negatives which were first covered with papier minéral, which was then cut away from the places where it was necessary to emphasise the shadows and coloured with a crayon and stump where it was desired to lighten any portion.

Mr. Barrett: I do not see that there is any illegitimacy in working on the back of a negative in order to secure effects which the operator would probably have obtained by means of the camera if it had been possible, but it would be a distinct advantage if some authoritative pronouncement were made upon this and kindred subjects. A negative often contains a great deal of distinct but unprintable detail, and one is in my opinion quite justified in adopting any means for the purpose of bringing it out properly in the print. When one comes to the question of adding some feature which was not present in the original, one is on more debatable ground; but, even if it be a sin, it is a very small sin if by it an artistic and beautiful result is obtained.

REDMOND BARRETT.

## COLLODIO-CHLORIDE VERSUS GELATINO-CHLORIDE.

It is peculiar that for glossy or enamel papers gelatino-chloride takes the lead, says Mr. G. Hamner Croughton, in the *St. Louis and Canadian Photographer*, but for matt papers there is practically but one paper that has any large sale, and that is a collodion paper. The reason for this is hard to discover, for the advantages and disadvantages of both papers, when weighed one against the other, is to my mind decidedly in favour of the gelatine matt. First I will take the question of surface. A collodion print is much more easily damaged after it is finished than a gelatine print. I have seen some collodion prints that were scratched by simply pushing them into the envelope. You cannot damage matt gelatine print in that way—in fact, you may rub your hardest with an ordinary handkerchief, and they will show no mark. The tenderness of surface makes a collodion print more difficult to handle in washing, toning and fixing, &c.—a very important item where a large number of prints have to be handled.

Again, a collodion surface is much more susceptible to stains from finger marks, &c., than the gelatine, so that much greater care in handling is required.

There is another aspect of this question which the advocates of collodion either do not know or they carefully ignore, viz., that a collodion paper is much less rich in the silver salts than gelatine, for, while there is no limit (within reason) to the amount of silver you can put into a gelatine emulsion, there is a decided limit to the amount of silver you can get into a given amount of collodion. As a rule, it can be safely said that the best gelatine paper upon the market has at least one-third more silver to the ounce of emulsion than the collodion papers have. Any practical printer will appreciate the importance of this fact.

A recent correspondent of the *St. Louis and Canadian Photographer*, writing in favour of collodion paper, mentions the fact that Mr. Bruce, of Duns, Scotland, used collodion paper over a quarter of a century ago, and continued to use it, but he forgets one important fact, viz., that collodio-chloride paper was the only emulsion paper made in those days, and that after the advent of gelatino-chloride it went into disuse, except in one or two instances.

I was well acquainted with Mr. Bruce, and was using collodio-chloride paper at the same time, and he and I exchanged experiences with regard to it, but I gave up using it as soon as a reliable ready-sensitised albumen paper was put upon the market.

There is another fact that the writer does not take into consideration, and that is that the Obernetter paper was put upon the market at a time when single albumenised paper was used, and therefore we were satisfied with a great deal less of the patent leather shine than has been demanded since. It was years before the era of baryta-filled papers, and that means a great deal to the manufacturer of collodio-chloride papers. Any manufacturer, or any one else, who has had any experience with the present-day baryta-filled papers, knows to his cost that with collodion emulsion he is much more dependent upon his paper stock for his results than the manufacturer of gelatino-chloride papers. The same emulsion on different papers will yield entirely different results.

Mr. Bruce and I both coated our own papers as well as using that made by Obernetter. We coated the Rives or Saxe papers sold for albumenising, and never failed to get good results upon it, which is more than I can say of later experiments upon various filled papers with the same formula. But the present-day photographer would not be satisfied with the modest gloss obtained with collodio-chloride upon an unfilled paper. Hence the manufacturer had to supply a paper so filled that the emulsion rests upon a substratum of various kinds, instead of on the pure paper itself.

To sum up, then, I have failed to find any warrant for the statement that a collodio-chloride print is more permanent than one made on gelatino-chloride, and, unless the advocates of collodio-chloride can prove that it is, they must give up the case, as there are so many advantages in handling and manipulation that, granted the claim of permanency or stability being equal, the gelatino-chloride paper must be awarded the palm.

I do not profess to be a prophet, but there is one thing I will venture to assert, viz., that the recent agitation with regard to the permanency of emulsion papers will not tend, as some think, to a return to albumenised paper. That would be a step backward indeed. The result will more probably be to call the attention of photographers to other methods of photographic printing, where the filled papers are not used and the toning process is dispensed with. This is found in the platinum process and the various other developing papers upon the market.

An old friend in England, in a recent letter, called my attention to the fact that he demonstrated before the South London Photographic Society a developing paper some twenty-five years ago or more, and adds that it is his opinion that there lies the printing process of the future. I believe he is right. There is everything to recommend it. There is no doubt of the stability of a developed print. The emulsion is coated upon a pure paper, without the baryta or other developed substratum. The colour is a pure engraving black, with the light formed by the pure paper itself. We are coming back to first principles, and it will not be long before the filled paper will be a thing of the past, and photographs will not suffer in stability thereby.



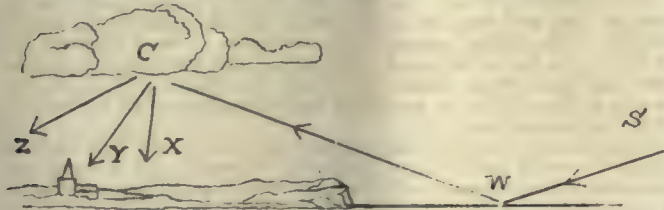
## PRACTICAL HINTS ABOUT PHOTOGRAPHY AT THE SEASIDE.

The following extremely useful article appears in *Photographic Scraps* for August: Those of us who can only get one holiday in the year, naturally wish to make the most of it by combining sea-breezes, summer days, and the use of our camera; but, having spent eleven months of the year away from the seaside, we hardly realise the special conditions for turning out the best work under somewhat novel conditions. Consequently, on development of our exposures, some disappointments and failures are found. It is with the intention of pointing out some of the more likely ways and directions of making mistakes that these seaside notes are put together. It may be found convenient to group our hints under a few different headings.

**Light and exposure.**—Most photographers know, in a more or less general sort of way—that is, they have “heard it said”—that the light at the seaside is quicker than it is inland; but comparatively few at all adequately realise *when* this is especially the case, and *why* it should be so. First, we must remember that the air at the seaside is usually clearer, i.e., clearer than in towns, there is less dust, smoke, and fine floating particles. Consequently *direct sunlight* is somewhat stronger, and we know this by the almost painful glare when the “sun is on the water,” i.e., when the rays which fall on the water are reflected or thrown back into our eyes. This explains how it is that the shadows of objects at the seaside look so much darker than usual. As a matter of fact, it is not the shadows that are darker, but it is the direct light, which is so much stronger and brighter, which makes the shadows appear by comparison to be darker, for a cast shadow is not a positive existent thing, it is the *absence* of light. This is a point of some practical importance, which we must bear in mind when considering what exposure we shall give to this or that subject. The tendency is for the eye to be deceived by the extra bright direct strong sunlight, and to ignore the old rule of “Expose for the shadows, and let the high lights take care of themselves.” Hence, so many snap-shots which yield prints of the “soot and whitewash” description. These usually indicate a twofold fault on the part of their producers. First, they are under-exposed; secondly, development has been too prolonged, in the vain hope that a longer time in the developer will compensate for too short exposure.

Next, with regard to reflected light. And here is the stumbling block for the beginner; for, when we tell him to give a shorter exposure on a cloudy day than on a cloudless one, he is apt to think that is “chaff,” and not practical advice.

However, this can easily be shown to be sound advice. Let us suppose the accompanying diagram to show us the relative positions (but not relative sizes) of a bit of sea, with cliff along shore, a church in a valley a mile or two inland, and a bank of cumulus cloud overhead. We are supposing the sun to be over the water, so that direct sunlight falls in the direction *s w*, meeting the surface of the water at *w*. Now, every one knows from experience how the surface of water or wet mud, rocks, sand, &c., acts like a mirror and reflects the light. Thus, the sunlight coming from direction *s* is reflected at *w*, in the direction *w c*. At *c* it is thrown upon a bank of cloud, and here it is scattered, i.e., thrown back in various directions such as *c x*, *c y*, *c z*.



Thus the cloud becomes a large source of light; in fact, a large number of very small suns spread out over a space equivalent to the size of the cloud, and these tiny suns (or water drops composing the cloud) send light in all directions. And so it comes about that, while the sea itself may not be visible from the church in the valley, yet it is bathed in a flood of light, which is thrown upon it by reflection from the sea.

Now let us suppose for a moment that the cloud bank, *c*, is removed, then the light reflected along *s w*, and then *w c*, passes away overhead, and, so far as this valley is concerned, it is lost. Thus we can see that we get more light on the church with clouds overhead than when the sky is cloudless. Observe also that this effect is not limited to a few hundred yards away from high-water mark, but may, with sun and clouds in favourable position, apply to places ten miles inland. If the beginner will keep this rough diagram in mind, he will find it help him in considering whether the clouds overhead are likely to be throwing down light reflected from the water.

And now let us again turn to the practical application so far as it affects our exposures. A moment's quiet thought will show us that with the cloud, *c*, overhead we shall have light scattered, more or less, in all directions, and consequently the shaded, or less lighted, side of our subject will have some extra light; in fact, it will be much better lighted than if the sun were overhead and strong light falling upon it; that is to say, with scattered light from the cloud our shadows are lighter than

with direct sunlight. Hence, recalling the old rule about exposing for the shadows, we see why our exposures will thus be shortened when our subject is lit by reflected cloud light.

It goes almost without saying that any large expanse of water, e.g., a river or a lake, will act just like the sea, i.e., as a vast reflector.

**Selection of subject.**—On this point a great deal more might be said than we can here find room for. We must therefore confine our hints to one or two of the more common mistakes or oversights which the less experienced are apt to make. One common cause of failure is that of misjudging *size* and *distance* over water. For instance, we see a full-rigged ship with all sails out away at sea. We know it is a fine vessel of considerable size, so we take a snap-shot with the hand camera; but on developing the plate, we are woefully disappointed to find that the tops of some railings, which we had not noticed, come out of great size, whereas our stately vessel appears a mere speck; with difficulty we just see the masts and sails, but the whole thing is a miniature, almost microscopic, when compared with what we thought we saw and what we expected.

Of course, if you are using a camera with focussing screen, you are not so liable to make mistakes of this kind, for you can see beforehand the proportions of your picture; but, if you are working with an ordinary hand camera, here is a little tip that will greatly help you to realise relative sizes, and foresee how large objects are likely to come out on your negative.

Take three ordinary stout pins with rather large heads. Cut them down so as to leave the head and about one quarter of an inch of pin. Now find the exact centre of the top of the back edge of your camera. This point will be just over the middle of a plate when placed ready for exposure. Here drive in one pin, so that its head may easily be seen. Next, draw an imaginary line across the top of your camera, so that it comes just over the diaphragm slot of your lens, or as near as you can get to that position; then drive in the two other pins, one to the right, the other to the left, so that they are as far apart as the length of your picture, or say, for a quarter-plate, four inches apart. If, now, you hold up your camera with the top level with your eye and your eye just behind the back pin, you can at the same time see the two front pins (four inches apart) and any distant object. This will enable you to compare the size of any object with the length of your plate. A very little practice with this simple dodge will enable you to spare yourself many a disappointment as regards the size of distant object, for it is a matter of common knowledge that it requires practice to judge distances over water. Closely connected with this topic is that of judging the angle of view; for, our judgment being upset by under-estimating distances, the result often is that we find we have included a very much greater range of view than we anticipated. Here, again, we find our three pin heads come in helpfully for they at once show how much view our plate will include; in fact, they give to us a simple but useful form of view-meter.

Our next hint is one drawn from the inspection of a considerable number of seaside snap-shots. In a word, it is the fault of including too many objects of interest in the view, with the inevitable result that the eye is confused, and the print is put aside, as irritating rather than pleasing. This goes to show the truth of the well-worn quotation, “The most important part of composition is omission.” Here is an excellent bit of photographic work, almost faultless technique, but in the space of a quarter-plate print we have, in the foreground, a man painting a boat, an admirable figure caught at a very happy moment—just beyond, a group of fishermen, hauling up another boat—beyond them, several other figures—still further away, a group of boat huts—beyond that, a ruined building on a cliff—and, behind all, an attractive sky. Here is material enough for, at least, four different pictures, but, when all put together, it is a case of “Prince, this is too much.” If your aim is not only making negatives, but also making pictures, do not forget that there is nothing which gives to a picture the strength that comes from extreme simplicity of subject.

We all need this reminder when at the seaside, because there are usually so many picturesque objects about us in all directions that our danger is not so much that of getting faulty subjects, but of having in the same picture too many different objects which have little or nothing to do with each other, and therefore are not helping each other, but are all calling out for our attention.

## MENTAL AND MORAL TRAINING IN PHOTOGRAPHY.

[From the Photo Era.]

I HAVE noted the importance to photography of manual training in the art of drawing. In acquiring a mastery of the hand we develop the mental organs that govern the sight. We have seen that the practice of drawing from nature will increase the judgment for selection, and the judgment of the ultimate result. In this paper we shall consider the effect of mental and religious culture on the development of photographic art.

As with the sister arts, the production of photography will respond to the condition of the mind. If it is elevated by high culture, the character of the work will harmonise with it. Here lies the importance of a general recognition of photography as an art. The cultured mind will see a legitimate field for the exercise of aesthetic judgment,



Those who fail to recognise photography as a fine art view it in its mechanical process, with no consideration of the mental force that is at the foundation of this branch. There may be little effort of the mind in the crude photograph (crude painting must come under the same ban); but, as the work of production is imbued with thought, the results are artistic, till finally the æsthetic expression is so great that a painting must be of high grade of art to equal it.

An eminent example of elevating thought in photography is seen in the collection of F. Holland Day. Not only in his remarkable heads of Jesus, but in his figures and secular heads, is the confirmation of the statement that the rendering of nature by any method in which the result is responsive to æsthetic thought is art; and, as the thought is ennobling, so is the art. Mr. Day is not a man to theorise around a vital subject, but he goes directly to it with concentration. Words are not necessary to assure the beholder that his productions are works of art.

Appointed as one of the Judges at the Exhibition of the Brooklyn Camera Club, the writer had the privilege of studying works of art that indicated an appreciative study of nature in different phases. There were admirable figure pieces, the leading one of which would be a rare subject for a painting. In the landscapes the effects produced were so thoroughly artistic that one might infer that the photographers had given special study to Corot, Daubigny, and Duprey, including Constable, the father of them all. Here, in this collection, is a marked example of the rapid progress of photography through the camera clubs of the country. If the works of the Boston, the Cambridge, and other noted clubs should be analysed, the influence of the intellectual and spiritual powers on the progress of photography would surprise the devotees of the art. The progress of the professional photographers, under the same conditions, was apparent to the writer in the Exhibition at Copley Hall, last summer. When he viewed this Exhibition, he saw mind; and when he stood before the Convention he saw that he was addressing men of thought.

It was on this mental basis that a French Judge passed judgment in favour of photography as an art. This is very significant; for questions of law are decided—not on mere theories—but on principles founded on incontrovertible truths. Judges cannot be governed by prejudice; they must decide from facts, and truth is evolved from them.

In a recent case brought in one of the French Courts the old question whether photographic portraits are works of art was revived. It seems a trader in issuing one of his prospectuses had used, by way of embellishment, the portraits of a number of actors and actresses, copied from photographs taken by M. Reutlinger, and he had sent copies to the persons represented. There was no doubt that they approved of the copying, but had they any right in the photographs? After a long course of argumentation the Court decided in favour of the photographer. He was declared to be an artist in the eyes of the law, his art consisting in the posing of the figures, arrangement of the lighting, and selection of the suitable moment for seizing the likeness. He had copyright in his plates, and the person represented, whether he had paid or not for the photography, could not authorise a reproduction of the plate. It was only by a written agreement that the right could be ceded. The photographer was awarded 500 francs as damages and the issue of the prospectus was prohibited.

With a comprehensive mind the Judge framed his decision upon statutory law—the law of nature and the law of common sense. This decision goes to the root. It is for the photographer to show that the growth from this root shall be an inspiration to man.

All art is raised to its sublimest heights by the sacred element; photography is not excepted from this law. The means for rendering nature being perfected, the facts produced must be vitalised with inspiring thought. There can be no cessation of mental action, for thought is ever active to enrich these facts with ideal conceptions. The higher the motive, the nobler will be the results. This truth is being demonstrated by professional and amateur photographers of Europe and America. The action of the imagination is so complex and incomprehensible, it is impossible to define its limits. It concerns mechanical invention as well as the ideal.

Thus far the æsthetic element of photography has advanced with the mechanical. The increase of facility through science widens the field of the imagination. The inventions of science are appropriated and made to serve the ends of æsthetic thought. In photography the practical and ideal will co-operate. The ideal inspires science to further discoveries, and science gives wings to the ideal for higher flights. The inspiration of the painter is enhanced by the enlargement of the means of expressing himself. So with the photographer. The character of his production depends not on manipulation. As with painting, manipulation may increase the artistic effects or general technique, but the operator who is gifted with mental power and spiritual refinement will select his scenes in nature with atmospheric effects, and picturesque shadows, with equally picturesque compositions, that shall express his thought—combinations which a superficial mind would not even notice. In the posing of heads and figures, and adjusting them in forcible effects of chiaroscuro, the results will accord with the comprehension of the operator. No manipulation will change the conditions. The Daguerreotype presents marked evidence of this truth, for in the process of its development no manipulation is possible. One Daguerreotype, from which photographs are now taken, is presented as an eminent example of strong effects produced by

power of mind. The writer referred to a portrait of Judge Shaw, taken by Southworth & Hawes. The Judge himself was a tower of strength, but it required a strong intellect to produce the remarkable Daguerreotype which we now see represented by the photographs. The pose and light and shade are indicative of power comprehending power. William Hunt's portrait of Judge Shaw is a strong one, but in Southworth & Hawes' portrait is the absolute power of a crag vitalised by a human spirit. We can find nothing in the boldest work of the boldest portrait painter that equals this work for its expression of supreme power. That this was no accident is evinced by Southworth & Hawes' Daguerreotypes of Daniel Webster, Ralph Waldo Emerson, and other eminent men. The female heads of these Daguerreotypes were no less remarkable for their beauty in pose and chiaroscuro. They saw and they knew. They produced their work with minds of comprehension.

Certain sceptics affirm that art has nought to do with religion. On the contrary, the highest art of all ages has been founded on religion. When we consider that the soul of man finds true life only through religion, we can understand that art, which is born of the soul, finds in it the highest development. All the arts—music, poetry, architecture, painting, sculpture, and photography—are subject to this law. Through the profane they crawl on the earth; by the sacred element they ascend heights of inspiration.

DARIUS COBB.

### PHOTOGRAPHY IN MANILA.

WHEN I first entered Manila in August 1898, I was very much surprised at the number of photographers doing business in the city.

There are only two English-speaking artists in the city, and they are generally kept so busy that it is impossible to learn anything from them. I have, however, been enabled to learn a little of their mode of work, materials used, &c.

The paper they use is the same as our own—collodion, except that it takes a longer time to print and will not stand burnishing. As a rule, writes Mr. J. D. Joseph to the *St. Louis and Canadian Photographer*, they squeegee all their work. They claim that the climate here is too hot for the American papers, notwithstanding the amateurs in the army use every variety of makes.

The retouching of their work is miserable. In fact, they have been so busy since the entrance of the American army that they make little pretence at retouching. The retouching is done mostly by natives, and for their work they receive only \$20 (Mex.) a month. It is little wonder that their work is not of the finest. They have very poor operating rooms, and, even when one is lucky enough to possess a good room, he makes little use of his skylight arrangements. They have one pose for all subjects, or rather they do no posing whatever.

The instruments used are mostly of German make, and not of the best. Some of the natives have very good lenses, but all the other trappings are very poor.

Their prices are high, the cheapest picture, a little two and one-half by four, being sold at four pesos, or two dollars gold, per dozen.

Notwithstanding all this, however, there is no other business in Manila that has flourished since the entrance of the Americans as that of photography. The soldiers, especially the volunteers, have a weakness for photos, as the photographers of San Francisco and other cities that ever were headquarters for troops can testify. No difference how low the finance of the soldier, he must have his pictures taken, and he does not quibble over the price.

If a competent American photographer had followed the Americans to Manila, he would now be on the high road to wealth, and, although the departure of the volunteers will take away the best customers, still Manila is a good field for a young photographer. Many amateurs in the army have made quite a rich sum for themselves, besides securing a very fine collection.

### COHEN'S IMPROVEMENTS IN GRAPHOSCOPES AND STEREOSCOPES.

At the top of a tripod or pedestal, A, is an open bearing, B, in which is mounted a spindle, C, enlarged at the point where it rests in the bearing, D, so as to form a ball-shaped pivot joint. E. The spindle, C, is held balanced in the bearing by means of screws or the like, F,  $\pi^1$  (fig. 5), and on its front end, which consists preferably of a tube, is furnished with a slot, R (fig. 3), and is closed by means of a knob, button, nut, or the like, O. The lens-holder, X, has a sleeve,  $\pi$ , arranged to slide on the spindle, C, being guided in the slot, R, by means of the indentation, I, and a vertical pin, L, taking into a slot in the handle of the lens, M.

The spindle, C, is connected with a frame, N, which holds the picture-carrier as well as the changing or sliding apparatus.

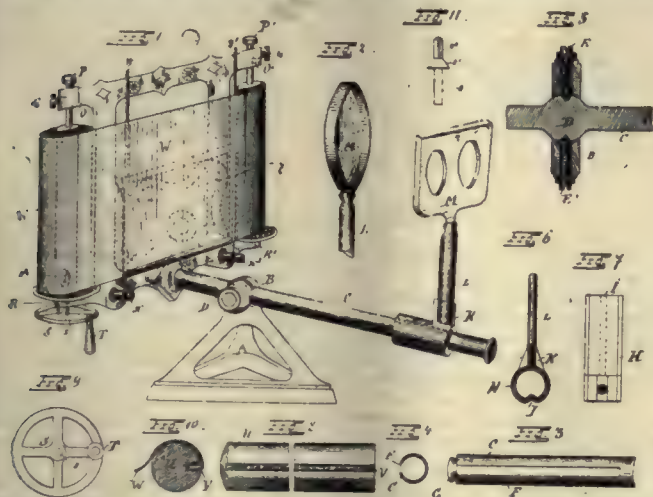
This changing or sliding apparatus is composed as follows:—

In the upper part of the frame, N, are ears or lugs, O, O', through which the regulating screws, P, P', pass. In the lower part of the frame, N, are other lugs or ears, R, R', serving to receive the driving apparatus or apparatus for rolling up the pictures. This consists of a driving wheel,



s, with or without a crank,  $\tau$ , fixed on a short spindle,  $s$ , and furnished with a cone,  $s^1$ , and polygonal end,  $s^2$ . The polygonal end,  $s^2$ , on the spindle takes into a socket or slot in the lower end of a roller,  $v$ , furnished with a radial groove,  $v$ , for fixing the sliding or changing picture,  $w$ . The screw,  $p$ , is formed with a conical end and is screwed against the end of the roller,  $v$ , so that the roller rotates thereon. The screws,  $p$ ,  $p^1$ , are then fixed by set screws,  $q$ ,  $q^1$ .

For the fixing of the picture-carrier, the frame,  $x$ , is furnished with two studs,  $x$ ,  $x^1$ , to which two rods,  $y$ ,  $y^1$ , are fastened by screwing or in some



other manner, and, for securing spring action, bent somewhat slightly inwards. Over the rods,  $y$ ,  $y^1$ , the picture-carrier,  $z$ , shown in dotted lines in fig. 1, is pushed, its side edges being bent over the rods, and its lower edge also being bent to form a support for the picture.

The action of the whole apparatus is as follows:—

The sliding or changing picture,  $w$ , is strengthened at the ends by being folded or doubled; it is fixed in the groove,  $v$ , and then rolled on the roller,  $v$ . The radial arrangement of the slot ensures the picture being held perfectly tight, so that, when unrolled, it cannot slip off the roller. As one of the rollers is employed for rolling the picture on, and the other for unrolling it, both of them must be so arranged that the grooves do not lie in the same direction. It is obvious that the pictures can be fastened to only one of the rollers, and pass round the other, which in this case serves as a guide, the two ends of the picture being placed in the same slot, which can easily be done without any alteration.

After the picture has been inserted and attached to a roller, the rollers are pushed over the polygon-shaped part,  $s^1$ ; the screw,  $p$ , is screwed into the roller and secured by means of the set screw,  $q$ .

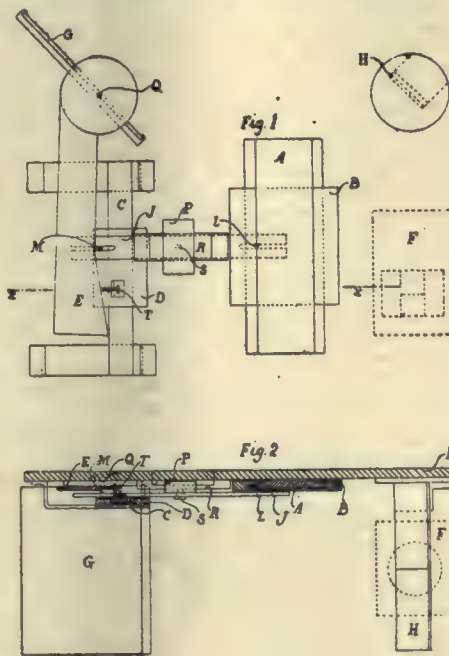
If, now, the wheels be rotated directly, or by means of the crank, the picture can be wound on and off the one roller on to the other, so that, if the lens has been duly adjusted beforehand, the picture will appear on an enlarged scale, and, in the case of a stereoscope, with realistic effect. The picture is moved over the picture-carrier. If the picture-carrier is to be used for simple pictures only, it is adjusted, as regards height, in accordance with the size of the picture, any position given to it being secured by the spring action of the sliding rods,  $y$ ,  $y^1$ .

The arrangement of the balance or rocking shaft in the tripod or pedestal serves to place both the spectator and picture in the proper light as well as to place the picture at a suitable height.

#### TEED'S METHOD OF FOCUSING.

MR. TEED gears the mechanism for focussing with the mechanism of a range-finder, of the type in which the baseline is contained in the instrument, so that the operating of the range-finder actuates the focussing mechanism in such a manner that the lens is in focus for objects at the range chosen. One method of carrying out this invention will be understood by reference to the accompanying drawings. Fig. 1 shows the relative position of the chief parts of the device in plan, but with the plate,  $x$ , removed. Fig. 2 is a section of the device taken through the line,  $x$ ,  $x$ .  $A$  is a guide upon which slides the sliding piece,  $a$ . The lens of the camera is attached in any convenient manner to  $b$ , and travels with it, being actuated by a rack-and-pinion or other suitable means.  $c$  is another guide parallel to  $A$ , upon which slides the piece,  $d$ .  $e$  is a lever slotted at each end and pivoted at  $s$  to the piece,  $p$ .  $p$  is a sliding piece which may be fixed in any desired position upon the guide,  $a$ ,  $a$  being rigidly fixed to the plate,  $x$ .  $l$  is a pin fixed to the piece,  $b$ , and working in the slot at one end of the lever,  $j$ .  $m$  is a pin fixed to the piece,  $d$ , and working in the slot at the other end of the lever,  $j$ .  $t$  is a screw fixed in a bracket on the sliding piece,  $d$ . The point of the

screw,  $t$ , is in contact with a cam-shaped piece,  $z$ , which is pivoted at  $q$ , and kept in contact with the screw,  $t$ , by means of a spring.  $g$  is a mirror fixed to the piece,  $z$ .  $h$  is another mirror fixed to the plate,  $x$ . The reflecting surfaces of the mirrors are towards each other, and  $g$  is so arranged that, when the lens is in focus for objects at an infinite distance, the mirror,  $g$ , is parallel to the fixed mirror,  $h$ .  $r$  is a bright finder, suitably placed for viewing the mirror,  $h$ . The reflecting surface of the mirror,  $h$ , only extends to the line opposite to the centre of the finder, the other half being clear glass. The movable mirror is geared with the focussing mechanism in such a manner that the image of any object shall be in focus in the camera when the portion of the object viewed after reflection from the two mirrors shall, as nearly as possible, form a continuous image with the portion of the object viewed directly. The curve of the cam,  $z$ , is, for convenience, worked out for a certain focal length of lens in conjunction with the baseline of the range-finder, so as



to have the two leverages,  $m$ ,  $s$ , and  $s$ ,  $l$ , equal, but, if it is desired, subsequently to use a lens of any other focal length, the leverages,  $m$ ,  $s$ , and  $s$ ,  $l$ , are made proportional to the focal length of the original lens, and the focal length of the lens substituted respectively, by shifting the position of the sliding piece,  $p$ , along the guide,  $a$ . The curve of the cam,  $z$ , may be obtained for a lens of any particular focal length, either by trial or by calculation. If by calculation, the angle through which the mirror,  $g$ , must be moved from its position parallel to the mirror,  $h$ , for any particular range must be combined with the distance through which the lens must be moved from its position at focal length from the focal plane to the focussing position, using for the calculation the well-known properties of lenses.

#### ORTHOCHROMATIC PHOTOGRAPHY—A REMINDER.

IN *Dry Plates* for August Mr. Cadett has the following notes on this subject:—

As time goes on there will be many who will be sorry that they did not (in its strictly scientific sense) take up orthochromatic photography before. In speaking of orthochromatic photography in its scientific sense our meaning can be taken in two ways:—

Firstly, where the photographer investigates the theory of correctly rendering all luminosities, and combines theory and practice. Comparatively few will, of course, do this, though it is a pity that it should be otherwise.

Secondly, where the photographer leaves science to the manufacturer, and contents himself with getting supplies of materials in the way of plates and light-filters that will enable him to render luminosities correctly without troubling his head as to the why and wherefore.

It is to the latter individual that I make an appeal. Many years ago, when a student in a mathematical class, the professor, looking at the row of anxious and in many cases despairing faces, bid them take comfort. Said he: "Most people incapable of understanding the why and wherefore of many difficult subjects have, nevertheless, excellent capabilities as regards practical use. It is not necessary to understand watchmaking to use and appreciate a good watch. It is not necessary to understand



the theory of logarithms in order to use them; indeed, there are thousands of individuals using logarithms constantly who if asked the nature of them could not tell you. We can use good lenses without understanding the curves, refractive indices, and dispersions of the materials used."

So, in a similar way, it is possible to obtain the most beautiful results in orthochromatic photography, provided the photographer has innate artistic feeling without worrying his head about theories.

I do not say that ignorance, generally speaking, has not its evils. In the case of orthochromatic photography it has been the cause of acceptance of conditions generally that have brought orthochromatic photography into disgrace. Light-filters have been used and put on the market for many years which have been a simple farce so far as correct rendering is concerned. Any piece of yellow glass has been considered good enough by many people, quite oblivious of the fact that all luminosities should be correctly rendered. A light-filter, in the orthochromatic sense, is simply a compensator for the imperfection of the plate. Strictly speaking, no light-filter should be required; but, as we must at present have them, clearly they must be adjusted to the particular plate used. This means measurement, either by trial and error, or by strict scientific measurement, and the latter is the only way to place light-filters into the condition of respectable commercial position. I have always objected to the word "orthochromatic," colour having really nothing to do with the matter. Had we called orthochromatic photography correct luminosity photography, there would have been some general education in the name. However, on the principle of conservatism, good or bad, we must, I fear, keep up our bad habits. I am anxious to induce as many as possible to take up orthochromatic photography, not merely because I am commercially interested in it, but as a matter of sentiment as to what is right; and, moreover, the Judges of our various exhibitions have to be taught, for they have been judging blue, violet, and ultra-violet renderings long enough. They will want educating as well as the rest of photographers.

The exquisite rendering of skies in landscapes, and indeed the whole rendering of the picture by correct luminosities, is such that, excepting for instantaneous work, no photography should be done without plates and filters correctly rendering all luminosities. A few trials on flowers will at once convince the most sceptical.

A little advice to beginners in this interesting branch of photography is necessary.

It is not wise to attempt subjects having a greater range of light and shade than can be rendered on white paper, for, though a greater range than this can be obtained in the negative, the print does not render it. This advice applies particularly in attempting work *against* the light. Carefully selected sunsets do not, however, give this trouble.

I hope that, at the forthcoming exhibitions, some interesting work will be shown, and all should remember that "correct luminosity photography" is the photography of the future.

### MOVING PICTURES OF GROWING PLANTS.

THE U. S. Agricultural Department is now making some interesting experiments, in which the moving-picture camera has been utilised. In one of their greenhouses the Division of Vegetable Pathology has an instrument of this kind in operation. It photographs the growth of a small oak-tree. The machine works automatically, taking one picture per hour. At night the exposure is made by electric light. The camera has been running for two weeks, and in about two weeks the experiments will be discontinued. When the series of pictures is completed, it will be possible to reproduce upon the screen the growth of a plant from the time the first shoot appears above the ground until the tree is in full leaf and a foot or more high. Of course, this experiment has no very great scientific value, but it will be an important test of the capacity of the machine, which it is intended to use in watching the progress of plant diseases, blight, parasites, &c. If it is found that the experiments are successful, the agricultural colleges and experiment stations can receive positives which can be thrown upon the screen which will convey many important lessons.

### ZONE PLATES.

At a recent meeting of the Photographic Society of Philadelphia, Mr. Morris E. Leeds called the attention of the Society to the use of "Phase-reversal Zone Plates as Substitutes for Lenses," and showed some of the applications of the process, which he said was of great scientific interest, though not of much practical value. M. Soret, a French physicist, in 1875, constructed a glass plate, having inscribed upon it concentric black circles of constantly increasing radii, proportional to the square roots of the numbers 1, 2, 3, 4, 5, 6, 7, &c., the whole being reduced by photographing until there were about ninety of these rings in a circle about one inch in diameter. He demonstrated the correctness of certain assumptions regarding the wave theory of light, by bringing rays of light to a focus with his zone plate, just as a lens will do. The plate was shown to have the remarkable property of having multiple foci, and it

acted not only as a convex lens, but as a concave lens, causing some of the light to diverge, as if coming from a virtual focus behind the plate.

After briefly explaining the principle upon which the zone plate acted, Mr. Leeds went on to say that Professor R. W. Wood, of the University of Wisconsin, had recently increased the efficiency of the zone plates by carrying out a suggestion of Lord Rayleigh, and producing a plate in which the alternate zones are on an extremely thin film of transparent bichromated gelatine (claimed to be less than  $\frac{1}{1000}$  of an inch in thickness), so that the light waves are given a phase-reversal instead of being screened off, this resulting in a fourfold illumination. Professor Wood has made plates of this character varying in focal length from 5 inches to 70 feet, the disk in the former case being about the size of a small pea. Mr. Leeds showed specimens of the Soret plates and of the phase-reversal plates (the latter of 180, 65, and 13 cm. focus), also photographs made with them, and demonstrated their use as telescope lenses, in one case employing a zone plate for the eyepiece as well as for the objective.

### THE SUPPLY OF METHYLATED SPIRIT.

THE following case was reported in a recent issue of the *Pharmaceutical Journal* :—

At the Exeter Police Court Mr. Charles Edward Rowe, of the firm of Messrs. E. James Rowe & Company, oil and colour merchants, 192, High-street, was summoned by the Excise authorities for selling, between March 12 and April 26, more than one gallon of methylated spirit at a time, to wit, thirty gallons, in contravention of the Spirits Act.

Mr. G. H. Dennis, barrister, of Somerset House, prosecuted on behalf of the Excise authorities, and Mr. G. H. Harris (Messrs. Ford, Harris, & Ford, Exeter) appeared for the defence, and pleaded not guilty to the charge.

Mr. Dennis, in laying before the Bench the facts of the case, said that the Act under which these proceedings were taken stated that, if more than one gallon of methylated spirit was sold by the retailer at one time, the retailer incurred a penalty of 50*l*. The licence to sell methylated spirit as a retailer cost 10*s*., but a methylator's licence, which entitled one to supply the spirit, cost 10*l*. 10*s*. If Mr. Rowe wished to sell more than one gallon at a time, he could take out a methylator's licence. The facts in this case showed that a list sent round by this firm to its customers and the public included methylated spirit. On March 18 last Messrs. Rowe received a requisition from Mr. F. Cutmore, chemist, of St. Marychurch, Torquay, for thirty gallons of methylated spirit. He sent the usual order, signed by the supervisor of the district, which showed that he was duly licensed to receive the goods. Messrs. Rowe received this order, and they sent a communication thanking him for the same, and intimating that they had ordered it to go forward to Messrs. Preston, of Liverpool. They also asked Mr. Cutmore to alter the name of the methylator on the counterfoil of the order; they had already done so on the order itself. The goods were duly supplied by Messrs. Preston & Co., and on April 11 the defendant sent the account, amounting to 4*l*. 11*s*. 8*d*., excluding discount, to Mr. Cutmore. This showed that a contract had previously been entered into with the defendant to sell. Messrs. Preston & Co. also sent an invoice to Mr. Cutmore. He (Mr. Dennis) submitted that the defendants clearly accepted the order, and entered into the contract to sell. The law was distinct on the question of supply and sale.

The Chairman (Mr. J. W. Petherwick) : Are the facts admitted?

Mr. Harris : With one exception, and that is that the invoice referred to from Messrs. Preston & Co. was sent off at the same time as the spirit, and, of course, arrived before.

Mr. Harris, in defence, said that the sole question in the case depended mainly in what order the facts occurred. His friend argued that there was an acceptance of the order; and he would say distinctly that a careful examination of the facts showed that there was no acceptance of the order from Mr. Cutmore, but that the defendants assisted in making a contract between a third party. If they looked at the letter sent to Mr. Cutmore, they would notice that he said he was "obliged for the order for the spirit, and had ordered the same to go forward at once." And then the communication went on, "Will you please alter the name of the methylator in your book to Messrs. Preston, Liverpool; we have already altered your request note." What was the intention in the alteration of the order? Why, the defendant wished to imply that he had no intention to supply the spirit. In the first place he had not got it, and in the second place he had no right to under the Act. On the receipt of the letter, what did Mr. Cutmore do? He probably thought, "Oh, yes, I made a mistake, I should not have ordered from Rowe, but from Preston & Co. I'll alter it in my book." Whether Messrs. Rowe had a right to pass on Mr. Cutmore's order to Messrs. Preston & Co. had nothing to do with the Excise authorities. He would also draw the Magistrates' attention to the fact that the first words on the invoice sent by Preston & Co. were "Bought of Messrs. Preston & Co." His friend had tried to convince the Bench that there was a contract before the order was sent on to Liverpool, but he (Mr. Harris), said that it was exactly the reverse. Messrs. Rowe's letter to Mr. Cutmore was to the effect: "No, we cannot execute the order, but we will send it on for you



to Messrs. Preston & Co., and we will alter the order." Supposing the order was originally made out to Messrs. Preston & Co., what could the Excise authorities have done then? Surely Messrs. Rowe would not have had anything to do with it. The summons might in that case be just as well taken out against the Postmaster-General for forwarding the order. With regard to the sending of the bill to Mr. Cutmore by the defendants, he (Mr. Harris) said that had nothing whatever to do with the contract. Mr. Dennis had said that the contract had been entered into when the defendants received the order, and had dealt mainly on that fact. The Magistrates had simply to consider the case as set before them by the prosecution, and, if the contract was entered into as Mr. Dennis had alleged, then what came afterwards did not bear upon it.

Mr. Dennis submitted that the alteration in the permit was made in order that no inquiry should be made by the inspector, who, if the permit did not correspond with its counterfoil, would naturally investigate.

Mr. Harris said that Mr. Dennis had no right to make such remarks unless he could prove them.

The Bench were of opinion that there had been a sale of spirit, and inflicted a fine of 5*l.* inclusive.

#### COPYRIGHT IN TRADE-CATALOGUE ILLUSTRATIONS.

An action was brought before Mr. Justice Grantham, on Friday last, by Croft & Perkins of the Great Northern Works, Bradford, Engineers, against Carter Bros., Engineers, Rochdale, for damages for infringement of copyright in a certain illustration included in their machinery catalogue. Mr. Scott Fox, Q.C., and Mr. Waugh were counsel for plaintiffs; and the defendants were represented by Mr. E. Tindal Atkinson, Q.C., and Mr. H. Manisty.

It appeared that the illustration in question was produced in the year 1890, and the catalogue was circulated amongst the trade. Plaintiffs claimed that, having made a certain article, of which they had taken a photograph, and reproduced it on a wood block and printed it in their published catalogue, they had the right to the exclusive use of the reproduction. Plaintiffs' catalogue was republished in 1892 and 1897, and in 1898 the illustration now the subject of the action was found reproduced in the defendants' catalogue and trade advertisements. It was the representation of an adjustable hanger.

Mr. Atkinson contended that this could not be the subject of copyright under the Act of 1842, inasmuch as no literary, artistic, or mental effort had been requisite to produce the plaintiffs' picture. Photography, he urged, had been dealt with in a separate Act of Parliament. The defendants' illustration had been taken from one sent in by a customer, and no doubt, he said, it was a copy of what originally appeared in plaintiffs' catalogue; but, counsel went on to remark, even Turner's sunsets were not a copy of nature.

His Lordship: That's very true. They're an improvement upon nature. Then you mean that the picture of this article is not at all like the original?

Mr. Atkinson: I don't say that.

One of the defendants, in cross examination, admitted that, although his firm had made a great number of adjustable hangers, they had not produced one of the design illustrated until a customer sent them the picture referred to. He had not seen the drawing in plaintiffs' catalogue.

His Lordship thought the case one of considerable importance. The matter was small, but the principle involved was great. He considered himself bound by the decision in the case of *Maple & Co.* and the *Junior Army & Navy Stores*. If he were to hold that the plaintiffs could not claim copyright, he should be opening the door to a great deal of fraud, considering the amount of illustrated work produced by the Press. The fact that the illustration was bound up with others in a book brought the case within the scope of the Literary Copyright Act. He found a verdict for the plaintiffs, and gave judgment for 40*s.* and costs; also, the defendants must undertake to withdraw from publication the catalogue containing the objectionable illustration, and undertake not to publish any more containing it.

#### THE SOUTH LONDON SOCIETY'S EXCURSION TO IRELAND.

The members forming a party for a trip extending over eight days in Ireland left Euston in reserved compartments at 6.30 p.m. on July 28, and, after a speedy journey from Holyhead across St. George's Channel, arrived in Dublin the following morning. The headquarters were at the Hamman Hotel, Upper Sackville-street. Here, after breakfast, the excursionists, which included ladies, were met by Mr. Victor Smyth, Vice-President of the Photographic Society of Ireland, who acted as chaperon for a part of the day, pointing out the principal buildings in the city of Dublin, and explaining their points of interest. Among other things, the "native" mummies in the vaults of St. Michan's Church were seen. Although of some considerable antiquity, these mummies do not compare in point of age with their Egyptian or Peruvian congeners, and their preservation is due to a natural process, and not to artificial methods. In the afternoon a trip was made by steam tram to the beautiful Lucan demesne, where many exposures were made. The Spa

water was tested, and varying verdicts passed thereon. Next morning cars were chartered for a long trip round Phoenix Park and the northern part of Dublin, including all the principal points of interest. In the afternoon the train was taken to Malahide, and a visit paid to Swords, with its round and Norman towers, and the ruins of an archiepiscopal palace. The evening was spent on the strand and beach of Malahide, where fine sunset effects can be obtained. On the station platform some amusement was caused by the Hon. Treasurer being mistaken for Dr. W. G. Grace, whom he resembles. At nine o'clock the following morning the party joined the Northern express for Drogheda, where specially chartered conveyances met them at the station for a drive of twenty miles round the Boyne Valley. The first stop was at Boyne Bridge, the site of the famous battle. The cairns (or, as they are sometimes called, caves) at Dowth and Newgrange were visited, and their archaic carvings inspected by candle light. The entrance passage at Newgrange is sixty feet long. Some considerable time was spent at the ruins of Mellifont Abbey, the oldest Cistercian remains in Ireland, after which the Monasterboice, with its ruins and far-famed crosses, &c., were photographed. Rather less than a mile from the latter place the excursionists were rewarded by an extremely fine view of the Mourne Mountains in County Down. The descent into Drogheda was made by the North Coach Road, and the night was spent in the town at the White Horse. The interesting remains of the old buildings left by Cromwell were duly photographed. On Tuesday morning a trip to Kell's by rail took place. Due justice was done to the crosses, the round tower, St. Columbkille's house, &c., after which the Boyne at Headfont Bridge was visited. Being unable to tear themselves away in time resulted in a large portion of the party missing the train, and causing them to beguile away an additional three and a half hours in the town, which, according to all accounts, they managed to do with good results. Tuesday night was spent in Dublin, and at ten o'clock on Wednesday a start southwards to County Wicklow was made. Bray, the Brighton of Ireland, was the first stopping place. Many exposures were made about the town, and after lunch jaunting cars took the party to the Dargle, where all available time was spent before dinner at the Bray Esplanade Hotel.

The following morning saw the party off to Rathnew, where cars were engaged to take them to a convenient point for visiting the Devil's Glen. The general opinion was that this valley was finer than the Dargle, and had the advantage of a good road alongside the greater part of the stream. The train was rejoined at Rathnew. At Rathnew Station special conveyances met the excursionists to take them to lovely Glendalough (seven churches), eight miles distant, where they arrived in time for dinner. Two nights were spent at the Royal Hotel. Friday was occupied in photographing about the lakes, the glen, and its numerous ruins and antiquities, which are of a character not to be found outside Ireland. On Saturday morning all left for a nineteen-mile drive across the mountains into the Wild Glenmalur, passing the untenanted Drumgoff Barracks, erected after the lively episodes of 1798 in this valley. Ultimately a stay was made at the Meetings Bridge, where the plaintive melody, "The Meeting of the Waters," played by the blind flautist Billy Kelly, was listened to. The journey was continued down the Vale of Ovoca as far as Woodenbridge, where the train was taken for Dublin. After the final dinner at the Hamman Hotel, the s.s. *Cambria* was rejoined. The excursionists arrived at Euston shortly before eight on Sunday morning. Here the party broke up with regrets that the time had been so short, but the regrets were tempered by the thought that much had been seen and done in the time, and that they would in the dark room and elsewhere live the trip which they had much enjoyed over again. Throughout, favourable and suitable weather prevailed, with the exception of a "wee skiff" lasting five minutes. Although fine, the weather was temperate, so that excessive heat was not complained of. The subjects dealt with during the outing were of a most varied, interesting, and pleasing character, and many fine pictures are expected to result from the exposures made.

The arrangements with the hotels were excellent. In the course of the drives the road was at times diverged from owing to the proprietors of some large demesnes permitting the conveyances to pass through their estates.

A desire was largely expressed that other trips to Ireland, under the leadership of Mr. Howard Esler, who is a native, will be arranged in future years.

## Our Editorial Table.

#### CONVENTION PHOTOGRAPHS.

By Mr. Alfred Seaman, Chesterfield.

ACCOMPANIED by his faithful stereoscopic camera, Mr. Alfred Seaman, the well-known photographer of Chesterfield, Ilkeston, and Sheffield, was, as usual, a genially prominent figure at the Gloucester Convention. He touches a soft place in our hearts by sending us a series of binocular photographs taken by himself during a very pleasant week. These include views and groups at Berkeley Castle; groups and interiors at the delightfully old-world New Inn Gloucester; boat on the Severn &c. Stereoscopically regarded, these pictures are all that could be desired: the



separation distances are in each case under three inches; the subjects are well chosen and the mounting correct. Thus, besides being most agreeable reminders of the Convention, they are also binocularly good. We wish Mr. A. Seaman's stereoscopic photographs the success they deserve.

#### KACHIN.

John J. Griffin & Sons (Limited), Sardinia Street, W.

FROM MESSRS. J. J. GRIFFIN & SONS we have received samples of kachin, the latest of the new developers, as they are now supplying it. There are the crystals themselves, and a concentrated solution, which only requires to be diluted with water to be ready for use. The former is put up in one and four-ounce tins, and half and one-pound bottles, the latter in tubes packed in boxes containing three, or one dozen each, price 1s. and 3s. 6d. respectively. The price of the salt is 2s. 6d. an ounce. Although this price seems high as compared with pyro at 1s. an ounce, there is little doubt, as the solutions keep well and can be used over and over again, that it is really cheaper in the end. Among the claims made for kachin, as set forth in the prospectus, are: It is capable of producing extreme softness or strong density at will; it is not influenced by the addition of hyposulphite of soda; by combining the processes of developing and fixing the most brilliant results are secured, making this method a unique remedy for over-exposure, and giving greater play in exposure; it is easily soluble in water, and is not influenced by temperature; it does not stain the fingers or plates, nor does it affect the skin; it is extremely economical, because the solution can be used repeatedly, and will retain its vigorous qualities even after continued use; it will produce negatives of great range of density, by different degrees of dilution, giving soft or hard results according to the nature of the subject; it gives clear, black-grey negatives, with perfectly clear shadows, even after prolonged immersion; it is very sensitive to the addition of bromide of potassium as a restrainer; it has the most durable keeping qualities, whether used as a single or two-solution developer.

Our experiments with kachin quite substantiate these claims. Here are the formulae for the use of this new developing agent:—

#### KACHIN-PHOSPHATE DEVELOPER.

##### Solution A.

Sulphite of soda	
cryst. ....	25 grammes, or 385 grains (avoirdupois).
Kachin .....	5 " " 77 " "
Water .....	250 " " 8 ounces "

##### Solution B.

Phosphate of soda	
cryst. ....	47 grammes, or 725 grains "
Caustic soda (purified in sticks)...	5 " " 77 " "
Water .....	250 " " 8 ounces.

These solutions will keep indefinitely.

**For Plates.**—For use, take 1 ounce of A, 1 ounce of B, and from 1 to 3 ounces of water. The full-strength developer gives the most vigorous images, and is suitable for snap-shots and normal exposures; the more diluted developer gives softness and half-tone. Bromide of potassium need only be used to correct excess in over-exposure. A single drop of a ten per cent. solution materially modifies the action. For under-exposures increase the proportion of B solution.

**For Bromide Papers.**—Take 1 ounce of A, 1 ounce of B, 6 ounces of water, and 9 drops of bromide of potassium (ten per cent. solution). In order to obtain deep black tones, add 20 to 40 drops of yellow prussiate of potash (ten per cent. solution).

#### CONCENTRATED DEVELOPER (ONE-SOLUTION).

Sulphite of soda	
cryst. ....	100 grammes, or 2 ounces, or 262 grains (avoirdupois).
Caustic soda (purified in sticks)...	14 " " 173 " "
Kachin .....	20 " " 247 " "
Water .....	400 c.c. " 10 ounces "

For use, the concentrated developer is diluted with from ten to twenty times as much water. Diluted with the smaller quantity of water, the developer works quickly and gives brilliant results; with more water, the action is slower and the resulting negatives are softer. The normal proportion is 1 part of developer to 15 parts of water. The addition of bromide of potassium is not necessary except for checking excessive over-exposure.

Do not add the kachin until the sulphite and caustic soda are entirely dissolved. The stock solution may be kept in corked bottles for a long time without deterioration. Slight discolouration does not lessen the active qualities of the developer.

#### CONCENTRATED DEVELOPER (IN TWO SOLUTIONS).

##### Solution A.

Sulphite of soda cryst. ....	50 grammes, or 771 grains.
Kachin .....	10 " " 154 " "
Water .....	500 c.c. " 16 ounces.

##### Solution B.

Caustic soda (purified in sticks)	7 grammes, or 108 grains.
Water .....	500 c.c. " 16 ounces.

For use, take 1 part of A, 1 part of B, and 2 to 6 parts of water. The normal proportion is 1 part of A, 1 part of B, and 4 parts of water. In the same manner as the one-solution developer, the stronger solution works more rapidly and brilliantly than the more diluted one. For under-exposure and more rapid development, increase the proportion of B solution.

#### FORMULA FOR DEVELOPING AND FIXING.

##### Stock Solution.

Sulphite of soda	
cryst. ....	80 grammes, or 4 ounces, 135 grains (avoirdupois).
Caustic soda (purified in sticks) ...	7 " " or 1 ounce "
Kachin .....	7 " " 1 " "
Water .....	75 c.c. " 10 ounces "

For fully exposed plates, take—

Stock solution .....	6 drachms.
Hypo solution (1 ounce of hypo to 5 ounces of water) .....	10 " "
Water .....	15 " "

Whatever may be said, theoretically, against developing and fixing at the same time, the above formula has yielded excellent results in our hands. We have no hesitation in saying that kachin is unsurpassed by any of the new developers we have experimented with.

#### "PROFESSIONS FOR BOYS AND HOW TO ENTER THEM."

By M. L. PECHALL and JAMES J. NOLAN. 316 pp. Price 3s. 6d. London: Beeton & Co., Limited, 10 and 11, Fetter-lane, E.C.

WE do not find photography included among the professions which the authors recommend to the consideration of parents troubled by the problem of what to do with their boys. It is probably not considered a "profession" ranking with the stage, journalism, the Stock Exchange, and other branches of genteel labour dealt with in this book. The authors, however, have done their work very thoroughly, and the details given of the many professions, which are described for the benefit of those desirous of knowing what possibilities of success they offer their sons, are full and ample. Dr. Welldon writes a preface to the book, which is well and plainly written.

WE have received an advance copy of the Great Eastern Railway Company's Booklet, giving particulars of the New Tours arranged in the Thuringian Mountains, the Luther Country, and the Hartz Mountains, via the Royal Mail-Harwich Hook of Holland Route.

MESSRS. PERCY LINDLEY & Co., of 30, Fleet-street, send us an advance copy of the London, Brighton, and South Coast Railway Company's *South Coast Quarterly*. This is a well got-up magazine, with photographic illustrations and descriptions of some of the more beautiful places served by the Brighton Line.

#### CATALOGUES RECEIVED.

WE have received the catalogue of a new set of over one thousand lantern slides of Italy, its art, landscapes, cities, and buildings, to which is added a synopsis of twelve former Italian sets made and published by Messrs. G. W. Wilson & Co., Limited, 2, St. Swithin-street, Aberdeen. The catalogue extends to twenty-four pages. The set is recommended by Messrs. Wilson to all lovers of art or of Italy. They point out that teachers—whether of classical literature, Roman history or New Testament history, and lecturers on such subjects as architecture, the Italian school of painting, Ruskin, Browning, &c.—will find that a judicious selection of slides from this set will keep their classes or audiences thoroughly interested. To assist intending purchasers in selecting slides suitable for their purpose, special catalogues of miniature illustrations have been prepared, each slide being shown on a small scale.

The Photochrom Company, Ltd., 121, Cheapside, E.C.

THE latest catalogue of the Photochrom Company is in two sections; the one devoted to foreign views, the other to views taken in the British Isles. The former extends to 112 closely printed pages, the latter to 28. Everybody nowadays knows that a photochrom is a photograph "printed in the colours of nature," and the appreciation in which the Company's beautiful productions are held may be gauged by their wide-spread popularity. Looking through these long lists of attractive subjects, it seems difficult to believe that there are many well-known subjects left for the Company to reproduce in colour; nevertheless, we believe the catalogue is "still growing."



## News and Notes.

A CORRESPONDENT of the *Daily Chronicle* vouches for the accuracy of the following story of *nouveau-riche* ignorance and fussiness. Some time ago a feminine member of this class went into a stationer's shop at Conway, and asked for a photograph of the castle. "Beeytiful castle," she simpered, "but, oh! what a pity they built it so close to the railway station!"

**PHOTOGRAPHIC CLUB.**—Anderton's Hotel, Fleet-street, E.C., Wednesday evening, August 16, at eight o'clock. Discussion: "The Permanency of the Bromide Process." Visitors are admitted to the meetings of the Club on the personal introduction of a member, or by invitation cards which the Hon. Secretary (Mr. W. R. Stretton, 4, Queen-street-place, E.C.) will be pleased to forward on application.

**PENNY IN THE SLOT PICTURES.**—Mr. Samuel Smith, M.P., writes to the *Times*: "Will you allow me to call the attention of the public, through your columns, to a new source of evil which has recently sprung up at our popular watering-places? I refer to vicious and demoralising pictures shown in penny-in-the-slot machines. I have had quite a number of letters in consequence of a question I put in the House of Commons to the Home Secretary. I give, as an example, an extract from one I had from Southport: 'I paid a visit about six weeks ago to a fashionable new arcade in Lord-street, and we entered, out of curiosity, the ground-floor premises of the penny-in-the-slot exhibition. I had three or four pennyworths, and I was literally astounded that the Southport authorities permitted such viciously suggestive pictures to be publicly exhibited. If those at Blackpool and other places are anything like those at Southport, they are a source of great danger to morals. Those at Southport are on the cinematograph principle, and, as the pictures are all moving, it makes them the more dangerous in their influence. Whilst we were in the exhibition, two or three girls were going round.' I understand it is difficult to obtain a conviction unless the outrage is of the grossest kind; but surely the local authorities can, at least, prohibit such exhibitions on the foreshores of seaside places which are under their control. It is hardly possible to exaggerate the corruption of the young that comes from exhibiting, under a strong light, nude female figures represented as living and moving, going in and out of baths, sitting as artists' models, &c. Similar exhibitions took place at Rhyll in the men's lavatory, but, owing to public denunciation, they have been stopped. Is it not possible to do this in other localities? I understand that many houses in London have recently been taken for these exhibitions. If nothing is done to stop this, we shall see a rapid decay of English morals to the level of Paris, with the same deadly results on the life of the nation."

THE forty-sixth report of the Science and Art Department of the Committee of Council on Education, signed by the Duke of Devonshire and Sir John Gorst, contains much interesting information on the work done under the auspices of the department during the year 1898. The volume is exceedingly bulky, and sets forth the detailed reports of nearly every important official connected with the working of the various institutions in which science and art are taught. Dealing first with the science division, the report records a considerable increase in the number of pupils under instruction. For the year 1898 the grants to science schools in England, Wales, and Ireland, exclusive of those made to training colleges, amounted to 169,604*l.* 3*s.* 8*d.* The grants for 1897 amounted to 172,495*l.*, but this included payments to science schools in Scotland which are now made by the Scotch Education Department. In the art division it seems that during the year ended August 31, 1898, 12,041 elementary schools with 1,458,911 scholars were taught drawing and examined under the regulations of the department. In the previous twelve months ended August 31, 1897, the number of schools examined and of scholars taught was 20,493 and 2,286,431 respectively. A paragraph in the report in reference to the art division, which will be read with great interest, deals with the grants allowed by the department. It seems that the payments on results and attendances for England, Wales, and Ireland amounted in 1898 to 72,128*l.*, as against 79,716*l.* in 1897, of which the grant for Scotland was 10,024*l.* The average payment per student under instruction in England, Wales, and Ireland for 1897 was 10*s.* 9*d.*, while in 1898 it was 11*s.* 11*d.* This increased rate is due to increased efficiency in instruction and improvement in accommodation and equipment of rapidly developing schools. The change in system from payment on results to payments on attendances (with payment for works and on results only, in honours, and subjects kindred thereto) resulted, with a few exceptions, in the allocation to the schools and classes of amounts of grant equal to what they would have earned under the old rules of payment.

## Patent News.

THE following applications for Patents were made between July 24 and July 29, 1899:—

- PHOTOGRAPHIC APPARATUS.**—No. 15,412. "An Improvement to a Photographic Apparatus." E. M. M. SMITH.  
**COLOUR PHOTOGRAPHY.**—No. 15,444. "Improvements in Colour Photography." W. N. L. DAVIDSON.  
**PERSISTENCE OF VISION.**—No. 15,496. "Improvements in Apparatus for Testing the Exact Duration of Persistence of Vision on the Human Retina." E. S. BRUCE.  
**CAMERAS.**—No. 15,563. "Improvements in Photographic Cameras." R. KROGNER.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
15.....	Hackney .....	A Plea for Fuzzy'types. For: W. Rawlings. Against: F. W. Gosling.
16.....	West Surrey .....	Demonstration: Developing P.O.P. C. Sheed.
16.....	Photographic Club .....	Discussion: The Permanency of the Bromide Process.
19-26 .....	Ashton-under-Lyne.....	A Week's Outing to Helensburgh and the Scotch Lakes.
19.....	Hackney .....	Excursion: Woolwich. Leader, H. W. Dunkley.
19.....	Oldham .....	Excursion: Chew Wells or St. Chad's. Leader, H. Varley.
19.....	Borough Polytechnic .....	Excursion: Wimbledon Common. Leader, R. B. Rawkins.
19-27 .....	Droydon Camera Club .....	Excursion: Belgium. Leaders, Messrs. Welford, Slater, and W. H. Rogers.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 3.—Mr. A. Mackie in the chair.

Mr. J. W. HODGES passed round a quarter-plate which had been exposed in a hand camera and developed in the usual way. The result, however, was a positive instead of a negative. The plate had been brought to him for an explanation of the phenomenon, and he could not give an exact account of its treatment.

Mr. J. S. TEAPE said the result was similar to that he had obtained with some hand-camera exposed plates of his own, and he had shown them at a previous meeting of the Association. In his case the developer was metol, and he had developed several plates simultaneously in the same dish. Some turned out good negatives, and others were positive pictures, as in the example shown.

Several suggestions were made as to the possible cause, none of which would, however, apply in Mr. Teape's case. One of the suggestions was that a similar result might be obtained by exposing the plate, after development had commenced, in the usual course to sufficient light to produce a stronger action on the plate than the original exposure, the reduced image protecting the part originally acted on. On continuing development, the result would be a positive.

Mr. E. J. Wright passed round a half-plate negative of the interior of a room. Each of the bottom corners of the negative was densely fogged. The appearance was similar to what would occur had a lens with a small circle of illumination been used and the front lowered to the intent of leaving part of the plate out of the field, but with a dense deposit taking the place of clear glass.

It was pointed out that, as the part of the plate protected by the rabbit of the slide was clear, the defect could not have arisen before the plate was put in the slide or after it was removed therefrom, and it was suggested that the cause might be discovered by setting up the camera under exactly the same conditions as when the negative was exposed and examining the lens fitting from the back of the camera.

Mr. Featherstone showed some gelatino-chloride prints toned in a phosphate bath made up of—

Gold chloride .....	1 grain.
Sodium phosphate .....	24 grains.
Water .....	24 ounces.

Thirty half-plate prints had been toned in this quantity of bath.

A general conversation took place on matters connected with gelatino-chloride printing, &c.

In reply to a question as to why, when gold chloride was added to a sulphocyanide bath which also contained sodium acetate, the usual blood-red colouration did not occur, Mr. E. BANKS said the colour was due to the formation of sulphocyanide of gold. This was slowly soluble in a solution containing an excess of sulphocyanide of ammonium, but solutions of the acetates and some similar salts dissolved it rapidly.

Mr. C. M. MOSS drew attention to the fact that there was a distinct variation in the tone of prints that had been treated in exactly the same way, except that the washing after fixation had been longer or shorter, and this was still more noticeable after the prints had been burnished.

Mr. W. D. WELFORD said he had been experimentally trying to induce frilling of plates under development. He had tried several brands of plates and various developers, the latter being, however, all of the newer introductions. He had not succeeded, although the recent hot weather had been in his favour. He attributed his want of success partly to the improved manufacture of modern plates, but principally to the developers used, which were far less liable to cause frilling than pyro.

### FORTHCOMING EXHIBITIONS.

1899.

- August ..... One-and-All Flower Show at the Crystal Palace (Photographic Classes). Hon. Secretary, E. O. Greening, 3, Agar-street, Charing Cross, W.C.  
 Sept. 22-Nov. 4 ..... Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.  
 „ 25-Nov. 11..... Royal Photographic Society. Hon. Secretary, Colonel J. Waterhouse, 12, Hanover-square, W.



- October 18-24 ..... Croydon Camera Club.  
 " 22-Nov. 19... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.  
 Nov. 27-Dec. 18 ..... American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.  
 December 7-9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### PHOTOGRAPHING MACHINERY.

To the Editors.

GENTLEMEN,—Allow me to offer a word of praise, with reference to your article (in last week's JOURNAL), "Photographing Machinery." I consider it a splendidly written article, and most useful to many, as you say, whose work is chiefly confined to studio work.—I am, yours, &c.,

W. E. FOSTER.

The Vandyke Studio, 17, Bennett's-hill, Birmingham.

### STEREOSCOPIC ILLUSTRATIONS.

To the Editors.

GENTLEMEN,—Your issue just received contains a notice of a work by Mr. Porter, which is illustrated by photographic views for the stereoscope which is supplied.

I have not had the good fortune to see the work, but it has recalled to my mind that, in 1858, the late Professor Piazza Smyth (of Edinburgh) published his experience in Teneriffe, which was also illustrated with stereoscopic views, and accompanied by a lenticular stereoscope. The Professor called attention to the fact that he gave for the first time a true representation of the appearance of the celebrated dragon-tree of Orotava, and compared it with the caricatures produced by artists who had depicted it more or less out of their imaginations. This process is called (euphoniously) putting some of himself into a likeness.—I am, yours, &c.,

J. F. T.

[The August number of the Camera Club Journal also contains the following note on the subject:—

Illustration by means of stereoscopic views is not new; the Club library contains a book on the temples in the Nile Valley illustrated in a similar manner, and published in 1862 by Smith, Elder, & Co. There is a great deal to be said for the stereoscopic form of illustration, but we are not sure that the half-tone process quite meets the requirements. The half-tone pictures, when viewed through a stereoscope, do not look so well as a stereoscopic silver print, as any one can see for himself by comparing the illustrations in Mr. Porter's book with those in the earlier publication.

Mr. Porter must be congratulated on having produced a most interesting work and for his boldness in employing what will be, to many of his readers, a novel form of illustration.]

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this causes delay.

\* \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

John Bailey, 73, Shirley-road, Southampton.—Three photographs of Victor Barton, Hampshire professional cricketer.

PUZZLED.—Many thanks. We, however, prefer not to publish. The statements invite the criticism you subject them to, but there are reasons why we do not care to have any controversy over the matter.

C. CARTWRIGHT.—Better send the residue to a refiner, as it is quite clear that you do not understand how to reduce it.

ALPHA.—You had better address your query to the Comptroller of Patents, the Patent Office, Southampton-buildings, Chancery-lane, London, who will send you a copy of the specification post free for nixpence. Sorry we cannot afford the time to make the search.

A. LEVY (Paris).—Thanks for your letter. In the peculiar circumstances of the case, which would take too long to explain to you, our correspondent could not possibly benefit by the advice. We reciprocate your good wishes, and hope to have the pleasure of seeing you in 1900.

MARKS ON PLATES.—R. ABELL writes: "I am troubled with scumlike markings on my plates, which are —'s make. They can be clearly seen on the plates before they are exposed. Can you tell me how to avoid them?"—No, we cannot, as the fault is in the plates themselves. They should be returned to the makers, or to the dealer from whom you had them, supposing you had them through a dealer.

STUDIO BUILDING.—P. P. P. says: "I am having a studio built similar to Mr. Debenham's described in Bolas's *Photographic Studio* (chapter ii.), with a pair of doors on the glazed side leading to the garden. Would it be better to have these doors open outwardly or inwardly?"—As the doors are to be at the side, it is quite immaterial which way they open. Make them to open whichever way will be most convenient to you.

SIZING PAPER.—J. WIDDOWSON says: "I should be quite obliged to you if you would give me in your next impression proportions and mode of working for sizing paper previous to sensitising, either starch or arrowroot."—The usual way is to add the sizing material, generally two or three grains of gelatine per ounce, to the salting solution. A small proportion of thin starch or arrowroot paste can, of course, be substituted for gelatine if preferred.

WARM TONES ON PRINTS.—SNAP-SHOT says: "Will you kindly inform me how I may obtain (in photographic prints) that rich, warm tone of brown so much in evidence in photographers' cases just now? Will these tones be as permanent as the old-fashioned purple sepia?"—The tones are obtained by simply removing the prints from the toning bath before they arrive at a darker stage. Opinions are very much divided, and always have been, as to whether brown-toned prints are as permanent as black ones.

FAULTY MIRROR.—PROCESS writes: "I am making some experiments in process work, using a mirror silvered on the surface, but I cannot get a sharp negative with it; there is no crispness. The lens is a Dallmeyer rapid rectilinear, and, without the mirror, the definition in the negative is splendid, but, with the mirror, there is no sharpness."—Clearly the mirror is at fault; its surface is not optically plane. Possibly, however, the glass may be right, but it is pressed too tightly by its mount. See to that. The glass should be quite loose in the mount.

CONTAMINATED.—HYPO. A. W. H. says: "Would you kindly give us an opinion of the following: About two-thirds of a barrel of granulated hypo is turned into something resembling fine cinders and ashes mixed. It is kept in a dry kitchen, and was in good condition some two or three days before we discovered it. In the mean time we had rather a severe thunderstorm. Could that be the cause?"—The appearance is due to the dry atmosphere of the kitchen causing some of the water in the crystals to evaporate. The thunderstorm had no influence.

MEMBERSHIP OF R.P.S.—F. C. M. M. says: "As I wish to become a member of the Royal Photographic Society, will you kindly furnish me with particulars as to what has to be done to join it? Kindly furnish address of the Secretary, also any particulars which will enable me to become a fellow in the event of my not being acquainted with any member. I understand you have to get a reference from two members."—In reply: Address, for particulars, The Hon. Secretary, Royal Photographic Society, 12, Hanover-square, W. We shall be happy to propose you for membership, which is obtainable by election at the hands of members. Fellowship, however, rests with the Council and a special Admission Committee.

MILDEW ON ENGRAVING.—X Y Z says: "Could you kindly inform me if it would be possible to remove mildew spots from an engraving? I have a valuable one, which has got badly marked with round dark spots, which, of course, show worst on the light portions, especially on the sky. Is there any chemical that would remove them without injuring the paper, or would it do to touch them over with water colour?"—The best thing to do is to bleach the print with chlorine, using either the hypochlorite of soda or the hypochlorite of potash. That will entirely remove the mildew from the lights and shadows. But we should advise our correspondent to put the print, as it is valuable, in the hands of an expert in print-restoring, as a novice at the work might ruin the picture. Plate paper, when wet, particularly after the action of chlorine, is as tender as wet blotting-paper, and requires the greatest skill in handling.

REFLECTIONS.—PUZZLED says: "I have been a reader of your paper for many years, and I should be glad if you could explain the following: I have taken several pictures this last day or two of bust and full-length pictures, and, upon each being developed, a reflection of the whole sky-light has appeared on the negative. I have had the subjects and accessories at the far end of the studio, and there is nothing to reflect in the studio. The curious part about it is, they have never appeared before, and I have taken hundreds in the same place without the slightest effect. If you could give me some idea of what is the cause, I should feel favoured."—The "reflection" is no reflection at all, but a secondary image, formed by a hole in the camera or its bellows, which has acted as a "pinhole camera." If the lens be capped, the focussing screen removed, and the camera examined from the inside in a strong light, with the head covered with the focussing cloth, the hole will be discovered; then the remedy is obvious.



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## EX CATHEDRA.

THE following announcement appears in a recent issue of a New Quay paper: "Photography. The Studio. Mr. Wallace Bennetto begs to announce that the studio is now reopened for the production of high-class photography. Sittings for portraits and groups daily. The studio will shortly be open for the production of portraits in colours direct from life. Further announcements will be made."

\* \* \*

WE are gradually accumulating quite a large collection of mystery photographs. By mystery photographs we mean pictures showing technical phenomena difficult or impossible of explanation. For example, some time ago a gentleman sent us a photograph of a horse which apparently only possessed three legs. In reality he had four, but the photograph said otherwise. No satisfactory explanation of this little mystery appeared to be forthcoming. The very commonest kind of mystery photograph appears to be the portrait through which a portion of the background, wall, or furniture, is seen to be visible. Movement or pre-exposure would appear to account

for such phenomena, but the photographs are usually of such a nature that it is obvious that no movement could have taken place. One of the most remarkable photographs of this kind we have recently seen was one of a natural history specimen taken in a museum. The specimen stood on a wooden block, which was apparently transparent to the lens, for an inscription on the other side of the block of wood appeared in the photograph as if the lens and the sensitive plate had penetrated right through the support.

\* \* \*

SOME time ago a friend of ours showed us a print from a negative taken by himself which caused him a considerable amount of mystification. He was photographing in the country with a small French binocular camera, and the resulting print showed that he had photographed himself arms akimbo, as one's position naturally would be with a camera of the kind described. All sorts of explanations were forthcoming to account for the puzzling affair, but none met the case. At last it was suggested that the position of the sun was at the bottom of the mystery. The photographer's shadow had been cast immediately in front of him while the camera was up to his eyes, and he had released the shutter not observing the immediate foreground and the silhouette of himself which it bore. But it was months before this simple theory was broached, and, in the mean while, others besides our friend had been nonplussed to account for the supplementary shadow in the photograph.

\* \* \*

IT is, of course, well known that a pinhole in the front or the bellows of the camera is very frequently responsible for supplementary images in photographs, but the cases we have in mind at the moment do not fall in this category. No; we are confronted by real mystery photographs, the phenomena of which are not explicable on ordinary grounds. Doubtless, many of our readers are at times bewildered in a similar way, and we should be glad to hear of such cases, accompanied, if possible, by specimen prints. To avoid misunderstanding, we may say that we are not inviting so-called spirit photographs, of which we possess quite as many as we care to have. What we want, in short, are photographic mysteries that are apparently impossible to solve.



A FORTNIGHT ago we mentioned the fact that a memorial to the late Dr. Ferdinand Hurter, taking the form of a lecture, was being organized by the Society of Chemical Industry, of which he was long a valued member. The photographic world is invited by the Hon. Secretary of the Royal Photographic Society to subscribe a sum of about 50*l.* towards the memorial, and we have no doubt that amount will be forthcoming. Dr. Hurter brought a highly trained mind to the study of photo-chemistry and photometry, and the work he and his esteemed colleague, Mr. V. C. Driffield, accomplished in the attempt to provide a practical system of estimating the speed of plates was of the very highest scientific value. We are sure that so long as photography exists Dr. Hurter's name will be appreciatively remembered, and it is fitting therefore that, in the endeavour to perpetuate his memory in the larger chemical world of which he was a prominent figure, photographers should claim the modest share they have been invited to take.

\* \* \*

THE widow of the late Mr. W. B. Bolton has the following apparatus for disposal. If any of our readers are disposed to buy from the list, we shall be happy to forward their letters to the gentleman who is undertaking the sale.

ROSS No. 3 WIDE-ANGLE SYMMETRICAL (No. 57,693).—5 in. focus, rotating diaphragms (*f*16 to *f*64). Covers half-plate with full aperture, or whole-plate with smaller stops. As new; only used three times. Cost 3*l.* 15*s.*; will sell for 2*l.* 15*s.*

SUTER No. 2 RAPID APLANAT (No. 13,464).—10½ in. focus; Iris diaphragm (U. S. system No. 2 to No. 100=*f*5.6 to *f*40). Covers ½-plate at full aperture. In good condition. Cost 6*l.* 5*s.*; will sell for 4*l.*

LEREBOUR & SECRETAN (Paris) SINGLE ACHROMATIC LANDSCAPE LENS (No. 4728).—6 in. focus; full aperture, *f*6; one diaphragm, about *f*12; brass cap. Mount scratched and discoloured, but perfect for working. Will sell for 7*s.* 6*d.*

MAX-LEVY CROSS LINE HALF-TONE SCREEN.—7½ in. × 5½ in.; 133 lines per inch. Perfect condition, in original wooden box. Cost 2*l.* 15*s.*; will sell for 2*l.*

May be seen at 6, Farringdon-avenue, London, E.C., or will be sent on approval if inquirer deposits value and pays postage.

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MESSRS. BABAGEE SAKHARAM & Co., of Calcutta, write us: "You are, no doubt, aware that in India there are only three journals which are devoted to further photography either as a science or an art. Whatever may have been the reasons which did not conduce to the rapid growth of photographic journals hitherto, it would be difficult to contend now that a desire to read photographic literature is growing strong. The fact of the new journal at Calcutta securing a good circle of subscribers in so short a time indicates the want that is sorely felt. This need is all the greater on our side of the peninsula, since, of the three Indian journals, two are published in Calcutta and one in Madras. Our position as dealers in photographic goods has prominently brought same to our notice, and created a desire to make an effort at starting a photographic journal. In order to make it sufficiently attractive and popular, it is of prime importance that the subscription should be within the reach of all. Another factor, and by no means inferior, is the quality of the reading matter. The articles must come from the pen of writers who are well known." We understand that Messrs. Sakharam & Co. are desirous of securing the assistance

of some English photographic writers of high reputation. Thus supported, the new journal should have a considerable chance of success.

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IN a recent number of the JOURNAL, *apropos* of the Premo Company, reference was made to the enterprise of American camera-manufacturers in supplying the English market with cheap film cameras, and the inference appeared to be drawn that none of the English manufacturers had so far considered it worth while undertaking the same kind of business. It was, of course, by pure oversight that the fact of Messrs. R. & J. Beck having long held a prominent position in this branch of manufacture was denied reference. The well-known series of Frena film cameras, which range in price from 2*l.* 18*s.* to about thrice that sum, have had a successful career of several years, and the fact that, following the example of *Charley's Aunt*, they are "still running," points to the conclusion that British enterprise, when it is equal to the occasion, is sure to be rewarded by success.

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WE have received from Messrs. R. W. Overton & Co., of 9 and 11, Underbank, Stockport, a copy of Vessière's weather chart for August and September 1899, for the counties of Cumberland, Westmoreland, Lancashire, and Cheshire, also North and South Wales, with North Devon and North Cornwall and the Western Midland Counties. Mr. Vessière observes that "no man has power to foretell the weather of a month hence—with exact precision; but that science has enabled the meteorologist to approach with astonishing nearness admits no doubt." He adds: "The many commendatory letters and allusions we have received from time to time concerning our charts have been somewhat discounted by the different tone of other critics who have found cause for complaint; but, as our experience entirely corroborates that of many highly intelligent and eminent scientists (great authorities on weather), we have not been disposed to feel downcast concerning its incorrectness of principle; we have not scrupled to admit that it is a system which is neither absolute nor faultless, yet one we advise the agriculturalist, out-door operator, tourist, and those responsible for the dates of sporting fixtures and out-door events, to adhere closely to, even if devoid of a normal credulity, as in nine cases out of ten the chart will agree with the daily forecasts issued by the Meteorological Office, and they will be successful in their choice of weather." The cost of the chart is one penny, and, as photographers have as much interest in the weather as most people, some of our readers may care to risk the investment.

#### LENSES FOR LARGE DIRECT PORTRAITURE.

REVERTING to the subject of large direct portraiture—see page 467 of the issue of the 28th ult.—we shall here deal with lenses suitable for that class of work. In the previous article it was mentioned that to obtain portraits with pleasing perspective the equivalent focal length of the lens should be at least double that of the longest dimension of the plate—we say at least, because a longer focal length than that would be still better in the case of large-size portraits. That is because the camera can then be placed at a greater distance from the sitter. This means, of course, that the lens is employed for a much smaller size than its maker constructed it to cover—



though not necessarily to be used for. In the majority of cases in this country, as we have already pointed out, possibly with the view to economy, the lenses are used for the full sizes they are catalogued to cover, and in some instances even larger, with the result that the portraits, by reason of the camera having to be approached very close to the sitter, are very unpleasant, owing to the violence of the perspective, which is often termed distortion, though it is not in reality.

We will now consider the question of lenses suitable for this class of work. As in the former article, we shall quote from the catalogues of our two leading opticians—Ross and Dallmeyer—for the reason that they both contain lenses of similar types, and with, practically, corresponding focal lengths and apertures; also because they seem to be the standards for other opticians' lenses. In the first place we have the portrait lens. Taking one of these of thirty inches focus, we find the price quoted at between 50% and 60%; one of the D or group, and the rapid symmetrical anastigmats, at 45% and 60% respectively. Referring to the list of rapid rectilinears and rapid symmetricals, the prices are about 25%. The first-named lenses have an aperture of  $f-4$ , the second about  $f-6$ , and the last  $f-8$ . Each of these instruments is constructed to cover from  $18 \times 16$  to  $22 \times 20$  inches, but, for the reason we have pointed out, they should not be used for sizes larger than  $15 \times 12$  inches when pleasing results are a consideration.

In the days of the wet-collodion process a lens with a large angular aperture was imperative, owing to the slowness of the process; but now that condition does not obtain, and those with smaller apertures may be used, and yet with much shorter exposures than used to be necessary, so that the portrait lens may, practically, be dismissed from present consideration. Next come the D and the extra-rapid anastigmats, and then the rapid rectilinears, and the rapid symmetricals with their  $f-8$ . Now, if any of the above be stopped down, which is necessary with all of them in order to get the different planes of the picture in fair focus, to the same aperture, the one is just as rapid as the other. Thus if, say, the portrait lens be stopped down to  $f-8$ , all things being equal, it will have no greater rapidity than the rapid rectilinear with its full opening, neither will it possess any greater depth of focus, and, if all of the three series be stopped down further, say  $f-11$ , the conditions will still be the same.

Why, then, it may be asked, pay for an aperture that is of little use in general practice? The only advantage is that the lenses with the larger aperture can be used under adverse conditions, as with a bad light or when photographing children, but then only at the sacrifice of "depth of focus." If, however, these lenses are used for pictures of only half their focal length, they will still cover the plate fairly well without a stop.

In his Presidential address at the late Convention, Mr. Wm. Crooke, referring to lenses, said: "One welcome addition for portraitists would be a lens for studio work that would in some respects resemble the Berghelm in diffusion of focus (too much diffusion would be undesirable), but having sufficient depth to enable focussing to be done roughly, say by measurement, in the studio." Now, do we not already possess a lens that, to an extent, fulfils this condition and have forgotten it? We have in mind the old plano-convex, or slight meniscus landscape lens by Ross and Dallmeyer of fifty years ago. This lens had a fixed stop of somewhere about  $f-15$ , and with that it yielded crisp definition over a tolerably wide area. These lenses are

intended to cover two-thirds of their focal length, and with the above aperture they are as rapid—theoretically more rapid by reason of their having only two reflecting surfaces—than any of the more modern lenses when stopped down to  $f-15$ . If, however, these lenses have their apertures opened out to, say,  $f-11$ , they will still give good definition over a field of half their focal length; and, if opened out still further, say to  $f-8$ , they will still give good *pictorial* definition over that area, such as would satisfy the general public.

It must be borne in mind that excessive sharpness in large portraits, such as results when lenses of the combination form are stopped down to enable them to cover the full sizes they are catalogued to cover, and with sufficient "depth of focus," is offensive to the general public and even to extreme anti-"fuzzyists."

Much of the late Mrs. Julia Cameron's early work was done with a large single landscape lens by Ross, with its fixed stop entirely removed and worked with its full aperture, which then had an aperture of about  $f-5$ ; but, of course, the pictures were of the "fuzziest" of the "fuzzy" order; yet, with the lay press, they tended to make that lady's fame. But, as we have said before, the single lens as turned out by Ross and Dallmeyer in the early sixties will, when the aperture is enlarged to  $f-11$ , or even  $f-8$ , yield excellent large portraits. Some of Mr. V. Blanchard's studies, it may be mentioned, for example, were also taken with a single lens with a very large opening, and this was also in the collodion days. Although the old form of landscape lenses is not made now, Dallmeyer has a long-focus landscape lens with an aperture of about  $f-10$ , and this should be suitable for large portraits. The front lens of the Petzval portrait combination, again, is very similar in character to the old form of landscape lens, and is therefore useful for large portraiture.

We have dealt somewhat fully with the old single lens for portraiture because an impression seems to prevail, even amongst professionals, that a compound lens is an essential, and with some even that a portrait combination is absolutely necessary. The late Mr. J. T. Taylor frequently referred to the suitability of the old single lens, with gelatine plates, for portraiture.

#### COMBINED TONING AND FIXING.

IN speaking of the double salt of hyposulphite, or rather thiosulphate of soda and gold, a casual statement was recently made that this salt formed the active toning agent in what is known as the combined toning and fixing bath. We are well aware that in treating upon this subject we are entering the thorny path of controversy. The actions set up during the process of combined fixing and toning are so obscure and difficult to trace, and the methods by which the results are obtained are so extremely varied, that any attempt to elucidate them would be a task beyond our power. We can only, therefore, speak generally upon the broad principles that are involved. There is, however, a certain simplicity about a combined bath, that is to say, in the use of it, which has a fascination for a very large number both of professional and amateur photographers.

We will at once state that toning is, or should be, a process of substitution, that is to say, that for each atom of gold deposited on the picture a corresponding atom of silver should be eliminated. It is not sufficiently understood, however, that



this is not always the case. In some forms of toning baths, of a somewhat unstable character, the decomposition goes on in the solution itself, and the gold is deposited in a selective manner upon the picture, in a manner analogous to silver intensification of a negative, or to physical development of a wet-collodion plate. In this case a thin coating of gold is deposited upon the surface of the print, and the silver remains behind, and so influences considerably the resulting tone obtained, and also in a large measure the permanency of the image.

A good toning bath should consist of a solution of a salt of gold in a state of unstable equilibrium. The disturbing element is the introduction of the silver print. As we have already pointed out, in ordinary toning baths the gold, in its dissociation from its chlorine, gives up first two atoms to the acetate or phosphate of the bath, and is thus reduced to the sub-chloride or aurous chloride, containing only one chlorine element to one of gold. An interchange at once takes place, and gold is deposited in place of silver, which is formed into silver chloride, to be removed in the fixing bath. Precisely the same thing occurs when the double thiosulphate or sulphocyanide of gold is employed, the silver sodium thiosulphate or sulphocyanide is substituted. If, now, the gold has been made with exact equivalents of hypo and gold, allowing no excess of hypo, then the double silver salt remains insoluble *in situ*, and undoubtedly acts as a further disturbing element, accelerating a further deposition of gold, and toning proceeds uniformly and rapidly, and that by a true substitution process. If, however, there is an excess of hypo present, the soluble double salt is formed, or, more correctly, this insoluble salt is dissolved and instantly removed, and toning is much slower. The greater the excess of hypo, the slower is the gold deposited, or, in other words, the bath is in a very stable condition and no longer parts so readily with its gold. Indeed, we should be disposed to question whether toning by gold ever takes place in a combined fixing and toning bath in such a state of purity as it should be when employed by a conscientious worker.

As against this, many will, no doubt, point out the experience and practice for many years of the thousands who habitually and exclusively employ combined fixing and toning. But here the question comes in, Is it gold toning? We freely admit that with the combined bath beautiful tones are readily obtained, and with an ease and comfort not to be found in the separate toning methods. But that this colour is due to any deposition of gold is exceedingly doubtful, and this is shown by the fact that almost any of these baths will tone equally well if no gold is added to them. When we consider that many of these combined baths in use are made up of a mixture of hypo, gold, lead, citric acid, alum, and other abominations, there is every justification for the belief that sulphur only is the active agent in giving the colour to the prints.

Let any one try the simple experiment of fixing a print, without any previous washing, in a freshly made solution of hypo of the ordinary strength, to which three or four drops only of a solution of sulphate of copper, of the strength of twenty grains to the ounce, has been added. This is a simple combined toning and fixing bath, which will give tones equalling those of the gold bath, but still no copper is deposited or enters into the constitution of the picture.

The tones are entirely due to the complex change which is induced in the hypo solution, accompanied by an elimination of sulphur and sulphur dioxide.

Hypo is one of the most unstable compounds with which the photographer has to deal. The addition of the salt of almost any metal, such as lead, iron, copper, or silver, or of any mineral or organic acid, causes a more or less rapid decomposition accompanied by liberation of sulphur, and sulphur toning is the result. We will take as an example the simplest form of combined bath, that to which a solution of hypo with a certain quantity of a solution of gold chloride is added. On the face of it such a combination is harmless enough; but, as ordinarily made, the acid chloride of gold or auric acid is added, and the same result would have been obtained with hydrochloric used alone without the gold. If the gold were first neutralised and then added to the hypo, or, better still, if the double salt of hyposulphite of gold and soda were first formed separately, and then added to hypo, it would be found that very little toning action took place unless some other disturbing element were introduced. This may be the print itself, just as it comes from the frame and containing considerable quantity of organic salts of silver and free citric or tartaric acids. But here sulphur toning is at once set up, and little if any gold toning accompanies it.

In making these remarks we do not wish to be understood as advocating any special method of toning. Though we believe that the conscientious worker will adhere to the separate toning bath system, yet it does not follow that a sulphur-toned print necessarily fades any more than a gold tone print is of necessity a permanent one. The question of permanence is a relative one, which we prefer not to enter into here. Imperfect fixation causes more fading prints than all other causes combined. If those who prefer to work with sulphur-toning baths, to give them their proper name, would only adopt one or two simple precautions, we should have much less complaint as to the fugitive nature of their productions. All the same, we would prefer to have them called sulphur-toned prints.

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**Liquid Air.**—It is, in a way, only the other day that liquid air was a great curiosity, a marvel of science, its production being proved by the issue of a mist from a tap when by its turning the pressure was released, and the cold induced by the sudden expansion sufficed to produce minute drops of liquid air, further proof of its having been produced being given by the sound of the drops falling upon a sheet of paper. Now air reduced to the liquid form is produced by the hundreds of gallons, and immense installations of machinery are to be found solely for the production of liquid air. That it will be found to have many uses for photographic purposes is most probable, if even for no other purpose than the marvellous cooling power it possesses. Our contemporary, the *Scientific American*, recently had an illustrated article describing the plant set up by the General Liquid Air and Refrigerating Company for the purpose of producing liquid air, and the extent of the manufacture may be gauged by the size of the huge machines. It is stated that a similar machine, with a possible output of 1500 gallons per day, is being made for Los Angeles, where it will be employed for packing fruit. It may be mentioned that, in connexion with this plant, a receptacle for holding and transporting the liquid air has been devised. It consists of a series of concentric spheres with insulating packing; the expanding liquid forms the atmosphere, passing through the spaces, and so cooling the bulk. The liquid is withdrawn after the manner of a soda-water siphon.

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**Photographic Researches on Phosphorescent Spectra.**—Under this title Sir William Crookes, F.R.S., recently read before the Royal Society a paper of the highest interest to scientific photographers. The actual object of research, the obtain-



ing pure samples of the new element discovered by him, is foreign to our purpose, but the means employed are of special photographic moment. Sir William found it desirable, in the course of his investigations, to obtain photographs of the invisible ultra-violet spectra of the substance at various stages of its separation, the fiducial lines of this portion of the spectrum being most marked; but, as is well known, these rays do not pass through glass, though quartz is transparent to them. Hence, the whole optical arrangement was composed of the latter material, and was contrived in a most ingenious manner. First is a pair of plano-cylindrical quartz lenses to condense the rays issuing from the incandescent body—*victorium* it is now called; the beam passes through two split right-angled quartz prisms, to be then received upon the sensitive surface. As their focal plane is not flat, but curved, the sensitive surface needs also to be curved to the same extent; this is arranged by using celluloid as a support. The whole arrangement is fully described and illustrated in a recent number of the *Chemical News*.

**Magnesium Flashlights.**—A possibly useful addition to the data governing the composition of these mixtures may be found in a paper recently read before the Paris Academy of Sciences by M. H. le Chatelier, who finds a greater certainty of combustion in mixtures of the nitrate of ammonia class by making a special crystal from a solution containing potassium chlorate and ammonium nitrate. By modifying the temperature of the solution and the proportions of the ingredients, he was able to produce a crystal of definite and constant proportions; it contained five per cent. of the chlorate.

**Splash Preventers.**—When water is taken direct from the main, it very frequently issues from the tap with such force as to be extremely inconvenient, not to say risky, to a negative showing an incipient tendency to frill. We have recently seen a description of a simple little filter attachment for a tap, which is intended to obviate this difficulty, and which is stated to permit the effluent water to issue in an unbroken gentle stream, but with its actual volume undiminished. We have not seen the apparatus in action, but it will very probably be efficient. Our present purpose in writing is to draw attention to the fact that there is a very simple means readily available for subserving the same purpose. No matter how violently water may issue from a tap through pressure at the main, the violence will be quite destroyed if a short piece of indiarubber tubing be slipped over the end of tap. The bore of the tubing will be necessarily larger than that of the tap, and, the issuing column of water having its sectional area increased, the pressure is necessarily, *pro rata*, reduced.

#### CHEAP ADVICE AND CHEAP APPARATUS.

The purchasing power of the modest "brown" has of late years become phenomenal; still it came somewhat as a surprise to find on the book-stalls and in the shops a manual of photography priced at the figure of one penny sterling! There is no doubt, judging from a perusal of its contents, that in a newer, not to say more orthodox and imposing, presentment this little handbook would meet with a ready sale at six times the price, for I may say at once that the advice given, though cheap, is quite free from that common fault usually attributed to goods which are to be had for next to nothing.

I am one of those who agree that the tyro in photographic work cannot too often be impressed with certain general rules and principles; thus, great care in manipulation of apparatus, extreme cleanliness in working, and the exercise of considerable patience are rules fundamental and indispensable to success. What says our penny guide? "It is easy to get good results with very little experience and a limited amount of knowledge, but only with a considerable amount of care." Here is a case in point: two acquaintances of mine, A and B respectively, own a couple of good magazine cameras, identical in structure and capacity. A and B are, photographically, only two months old, but, while A is rapidly accumulating an album full of bright, speaking little bits of local life and colour, B can show scarcely one decent picture! The reason of this falling off is not difficult to discover if you watch B handling his camera in the open; you then say to him that he will never do any good at

photography until he takes a more serious view of the art and practice of picture-taking, masters the intricacies (such as they are) of his apparatus, handles and carries it with reasonable care, and, above all, endeavours to assimilate, if only from books and tables, some general notions of what, in the form of a picture, may be taken with the instrument. Some beginners ought certainly to be put through a course of wet-plate work, a branch of the art which requires a man to handle his tools gingerly if he is to produce any results.

But there is another point: a man will never learn anything of the mysteries of exposure unless he undertakes, in his own person, all the operations of loading the camera, exposing the plates and development of the same, and, finally, of *printing*. How is a man to learn the value of a good negative, to understand what is required of, and meant by, a good negative; or, to put it even more simply, the value of a little more or a trifle less exposure, unless he develops his own exposures and makes his own prints? Think also, for one moment, of what a nuisance this careless man is to his friends, and, above all, to the unfortunate individual who has the development of the exposures—the waste of *time*, and *plates*, and *opportunities*!

When selling cameras (hand cameras, say) the price of the apparatus naturally is an important, perhaps the most important, consideration. We take two cameras, and find that one is ticketed at a guinea, and another at four times that figure, the difference only, leaving out some trifling details, improvements in finish and the like, being that in the higher-priced outfit the lens is a rectilinear. Of course, we take that to be, at first sight, a sufficient reason for the increased charge; but wherein (barring the slightly improved appearance and finish aforesaid) is the one outfit four times the worth of the other? Now, it cannot be denied that the well-made, simple, single lens is a very popular and valuable instrument, valuable out of all proportion to its monetary cost; for pure landscape, some copying, groups, and (in the hands of an expert) certain forms of architecture, this is a lens hard to beat. We say, with some degree of sentiment, that the rectilinear is the best all-round lens, but it is not worth all the extra cost unless it be a lens of undoubted excellence of manufacture; that is to say, if one can only afford a second or third-rate article, the purchaser had better save his money, and for the difference between one and four guineas the lens should bear a name of unquestioned repute. The pre-eminent advantage of a rectilinear lens is the extra rapidity; this, in my opinion, takes precedence (for hand-camera work particularly) of the other points usually credited to this class of lens: flatness of field, freedom from distortion, and so on.

With single lenses of the better class we get wonderful definition, and, if of reasonable focal length, no great amount of distortion; but they often fail us when the light is bad: the tyro expects his apparatus to take "everything," and, if we can start him off with the rectilinear as part of his outfit, we get a step or two nearer the unattainable. Some beginners have a fancy for a wide-angle rectilinear, or, having a wide-angle rectilinear, use it without much discrimination; perhaps it will be safe to merely mention this fact, because wide-angle rectilinears take some studying and manipulation, and errors (the result of their use or misuse) are not always confined to beginners. It comes to this, however, that a great deal may be done in the way of distortion with rectilinears by the otherwise well-meaning but inexperienced operator.

With regard to apparatus, cameras for stand work that is, some good and wholesome advice is given, including that somewhat mystical and questionable axiom, to the effect that if money is a scarcity the cost of the camera should be brought to the lowest figure to the advantage of the lens. One might add, with much truth, that another item which should not be unduly "pinched," is the stand; a rickety stand is of no practical use to anybody. The market is full of shoddy apparatus, most of it fit only for the fire; but, on the other hand, some of this cheap stuff is not at all badly designed—rising front of great range, and nearly square bellows, being notable features, they could be improved further by the addition of a cross front. These cheap outfits are usually fitted with an equally cheap rectilinear (very rarely you may hit upon a really good instrument), which will require a lot of humouring. They can be made to do some fair work, but not without a lot of manœuvring. The cheap professional is a marvel in his affection for shoddy apparatus, and not always from impecuniosity. He will come in and say, "I've made up my mind, Mr. P., to go in for a really good whole-plate set, what do you think of one of So-and-So's," mentioning a well-advertised variety, at 5*l.* 5*s.* complete? This is on a par with the man who, being sent for some good hot-house, fresh, ripe, and luscious grapes, buys some of the imported variety, sawdust included, at 6*d.* per pound. You see one result of the cheap and shoddy in the deplorable series of photographic groups of school children (whole-plate, mounted, price 6*d.*), scattered broadcast



over the country. Such pictures and groups ought to be, and might easily be, made extremely interesting and valuable; as it is, they are for the most part abominations, and reflect anything but credit on the present generation. "Some lenses represent a straight line near the edge of the picture as curved; others (rectilinear) reproduce it correctly." This is so, but with the cheap and shoddy rectilinear you may get something worse than a slight distortion of lines, as witness some of the groups abovesaid.

It is all very well to emphasise this necessity for careful working, but very often our amateur workers fail to have a fair start; there are cameras, arrangements, that is, consisting of dark chamber, lens, and plate-holder, with which no one could do any good. And one is constantly calling attention to the necessity for a rigid stand; a strong, but not necessarily heavy camera made of good and well-seasoned wood, not over-much weighted with showy brass fittings, easy-fitting, well-made slides, true in register and so forth, without making any impression on the steady flow of the "weak-kneed" stuff placed on the market, nor, I fear with little advantage to the consumer, who cannot discover faults until too late, nor estimate their importance until practice and experience have shown him what is or is not desirable in his outfit. On the whole, I think it is of first importance to have a really well-made and designed camera and stand rather than spend the bulk of one's funds on an expensive lens (which on a faulty camera can give little satisfaction). Brilliant work can be done with the comparatively cheap single lens; but there is a consolation also for the user of the cheap rectilinear, let him only study the vagaries of his instrument and he may found a new cult!

J. PIKE.

#### JOTTINGS.

I RENEWED acquaintance with the Gloucester Convention last week in Edinburgh. Such a geographical achievement is, of course, only possible by means of photography, which, in a sense, allows you to emulate the feat of the bird that was said by Sir Boyle Roche to have been in two places at once. To be precise, it was in the Edinburgh establishment of the well-known opticians and apparatus-makers, Messrs. Lizars, that I saw an animated photograph of a large party of Conventioners, taken on one of the excursions, and as I looked at the moving panorama of Convention life and character—there is a great deal of character sharply outlined at a Convention—I seemed, while standing in the Modern Athens, to be living the whole of the Gloucester week over again in the short space of time taken for 150 feet of film to pass through the machine.

Pleasure, it is said, may be divided into two parts: anticipation, retrospection. In the present case they are unequal parts. The pleasures of memory evoked by the Gloucester Convention seem to increase as the days go by. You may be limited by the possibilities of anticipation, but, when you look back upon a particularly happy phase of life that marks itself out from the rest of a humdrum existence, you are apt to find your appreciation of it grow with the distance from which you contemplate it. So it is with the Gloucester Convention. The farther it recedes from view, the brighter and pleasanter it becomes to the mental gaze.

The cinematographic view of the excursion party, which was composed of very well-known figures in the photographic world, led me into this little train of thought. The members are leaving the Severn steamer at Tewkesbury, and in watching how each one, lady or gentleman, young or old, makes across the plank for the shore, you appear to have set before you on the screen the self-revealed character of each person there. Perhaps I speak with special knowledge, as I have the honour of the acquaintance of most of the figures in the picture. However, those who make the matter a special study tell us that character may be read from a person's walk, so that perhaps others, when they come to look upon this animatograph, although the figures are strangers to them, may form a good idea of the traits and foibles of the originals. I do not know, however, that the picture will ever be publicly shown. It is the property, and is in the possession of, the President, Mr. Crooke, for whom it was taken and very well taken, too, by Mr. Paul, of Hatton-garden.

My reference to Edinburgh will tell the reader that I am holiday-making in North Britain; and it is so. I am writing these lines in sight of the Bass Rock and the red-brown jaggedness of the Had-dingtonshire coast, and, for the moment, every prospect pleases. A calm sea is bathed in mellow sunbeams, white fringes of foam kiss the grey and green islets that guard the shore, and the breeze has just so much bite in it as to keep you cool and give you a premature appetite. But the wild and ragged scenery before me is not "photographic," and the hand camera does not appear to be in evidence amongst the visitors to the little town. It is so seldom that I am able to escape photography and the interrogative attentions of those who practise it that I confess to not being sorry at finding myself for a few hours amid absolutely non-photographic surroundings. If I were able to lengthen those hours into weeks or months, I tremble to think of the state of enthusiasm I should be in when I got back to the thralldom of cameraland. It might then be possible for me to grow eloquent over the newest developers. This I take to be enthusiasm in its highest form.

Talking about escaping from photography and photographers, I was thinking I had done so one morning last week, when I was promptly made aware of my error. The 11.30 p.m. "flier" from King's Cross had whisked me down to Edinburgh, and when the sun was well up I started off, invigorated and refreshed, to take my walks among the gaily dressed throngs always to be seen in one of the most picturesque and "gilt-edged" thoroughfares in the world, Princes-street, with which Regent-street, London, is not to be compared. I was just feeling that the sunniness and animation of the scene was sending the roar of the train out of my head and was putting me in trim for a few days' rest with the weight of journalistic liabilities off my shoulders, when right opposite the Scott Monument I was waylaid, captured and held in bondage by a genial Scot, who, before I could realise it, was favouring me with a long and volubly delivered lecture on—not to be too precise—the speed of shutters! Really, I felt inclined to tell Fate that she had played me a very shabby trick indeed. However, even this lecture came to an end at last and I was free to take my dose of Princes-street mentally hoping that I was not destined to pass the whole of a brief vacation in listening to expositions of photographic technology.

Edinburgh's Princes-street photographic establishments vie, in the quality of the work produced there, with the studios of any other thoroughfare in Britain with which I am acquainted. Judging, however, by the specimens that are to be seen, the influence of one man is very conspicuous in its effects upon the work of his *confrères*. Light brown or straw-board mounts of certain sizes and shapes, bearing photographs in a particular shade of sepia carbon or platinum, have for a long time past been associated with the photographic individuality of one particular gentleman whose style of work they are so generally recognised as illustrating, that without the name at the bottom one has hitherto had no difficulty in tracing them to their source. But it was somewhat of a surprise to me to perceive that this gentleman's peculiar characteristics of colour and shapes of mounts, and the tones of his prints are clumsily imitated in several quarters. Surely photography offers such wide scope for individuality, if not originality, of treatment that the need of doing what one's neighbour does is as small as its inadmissibility is great. That photographers should yield to the influence of one among their number who has been successful in importing a highly cultivated individuality into his work is only natural; but that influence, in my humble opinion, should not be allowed to drag those upon whom it reacts down to the comparatively low level of mere imitation.

I took up the pen with the idea to make these a series of holiday jottings, and nothing beyond, and here am I rambling off into the dry fields of ethics. But Edinburgh is a very serious place, of course, and its influence has exerted itself upon me, I suppose. I do not want to send more photographers there than there are at present, but Edinburgh strikes me as being a very good centre indeed for professional photography. In those districts where you get the



higher middle-class men the prosperity of the photographic studios, and the signs of business in course of transaction, appeared to me to be considerable, as I took my rambles round Leith and Newhaven, where the fishwives abound. Edinburgh culture and beauty may not go down that way to be photographed, but there is evidently a large and paying *clientèle* to support Leith's many studios, amongst which I saw no signs of the meanness and squalor that are only too apparent in London and other large towns.

There is a branch of photography the difficulty of which I should think could only be equalled by its fascination—I allude to the portrayal of sporting dogs at work. Last week good fortune and a friend took me to Mornay, among the Lammermoor hills, for the grouse-shooting, and, not carrying a gun, I had every opportunity of studying the ways and manners of the dogs at their work. To do the animals justice by means of photography, doubtless, requires a thorough sportsman to use the camera—men like Mr. W. J. Croall and Mr. Herbert Bowling, whose very fine studies of sporting dogs in the field are triumphs of fidelity and realism, obviously possess expert knowledge of what is required in photography of this kind. Now and again, when the dogs were “pointing,” and the whirr-r-r of the rising birds was followed by the crack, crack of the gun, I was tempted to lament that my camera was not with me; but, not being a “shootist,” I consoled myself with the reflection that, though they might have some photographic merit, my results, if I obtained any, would be more than likely to lack the illustrative points which your sportsman naturally looks for first of all.

Though my charming hostess on the moors smilingly avowed her objection to cameras being used in the shooting box, my companion had his pocket Kodak with him, and had many unique opportunities of using it on the “Twelfth.” His results should prove amusing to look at. It was a blazing hot day among the heather, and some of our costumes, if light and cool, were unsuitable for exhibition in Princes-street, Edinburgh, or Piccadilly, London—pyjama jackets, “slouch” hats—but I need say no more on that head. Not even at the Photographic Convention could such quaint groupings and figure studies be seen. Grouse-shooting (and our party secured sixteen and a half brace, besides many hares, rabbits, snipe, &c.) is a serious as well as an exciting business, and the use of the pocket Kodak served to lighten and diversify the proceedings.

It is the life that I have been leading the last few days—shooting, fishing, golfing, sailing, hill-rambling, and the variegated and undying charm always to be found on large farms, have all been at my disposal—that gives the photographer immense scope for work. It makes one reflect that one's camera should keep company with those little personal *impedimenta* that are never left behind, be always with one in fact. You need nothing larger than a pocket camera for securing the natural and spontaneous groupings and subjects that constantly present themselves to you. They would lose all their naturalness if faced by the very businesslike-looking camera on a tripod. In this respect my companion shows his wisdom. Wherever he goes his pocket Kodak goes with him, and in the four years he has carried it a rich harvest of these nature subjects has fallen to his share. On the whole, I begin to regret having left my hand camera behind. In “escaping” photography this vacation I have thrown away many golden opportunities, opportunities that the town-dwelling photographer sighs in vain for. Decidedly I must unsway what I have said. Photography and the camera should be always with you.

Bidding adieu to the gracious lady of Lammermoor and my hearty host, hand grips are exchanged, and, with a last look at the dogs, the horses, the cows, the trout stream in the valley, and the heather-clad moors, we are driven away from the Ravenswood country in the early morning. By nine I am on the Haddingtonshire rocks, seated at my table on the verandah which overlooks the

German Ocean. The post has brought me three parcels of letters, papers, photographs, &c. In a few minutes the pen is in my hand again; my kindly hosts and hostesses leave me to myself, and, though the murmurs of the waves are in my ears, the soft breezes fanning my rapidly browning face, and the hot sun is driving the sea fog off the surface of the blue-green wastes at my feet, moorland and sea are quite forgotten, and the pen, as it journeys across my writing book, carries me, for a while, three or four hundred miles away, and my heart and mind are in the world of photography once more.

COSMOS.

## THE RAPIDITY OF DEVELOPMENT.

[Translated from Dr. J. M. Eder's *Jahrbuch für Photographie*.]

IN the development of a gelatino-bromide plate the exposed silver bromide is converted to metallic silver by a solution that effects reduction. The blackening of the photographic film in consequence of this reduction will take place more rapidly in proportion to the intensity of the light and the length of exposure. The development of a plate exposed in the camera is therefore progressive. Reduction begins at those parts corresponding to the highest lights, and gradually extends till finally metallic silver is also reduced from those particles of silver bromide which have been but slightly affected by light. At this stage the progress of development is stopped. The time occupied by the process is called the “duration of development,” and its reciprocal expression “rapidity of development.”

The progressive course of the phenomenon of development may be explained in the following manner. The molecules of the reducing substance which the developing solution contains are in a different condition of motion, and this gives rise to differences in their reactive power. The fully exposed silver bromide is affected by molecules with only slight reactive capacity, whilst those particles which have had little exposure to light are only amenable to the impact of molecules of great reactive capacity.

As every part of the silver bromide film is subjected to the influence of the same number of molecules of developer in the same unit of time, and as nearly all have the power of reducing fully exposed silver bromide, whilst but few have the capacity of decomposing the slightly exposed silver salt, it follows that the first signs of reduction or darkening of the film must be shown by the former.

The explanation of the progressive course of every chemical reaction may be similarly regarded, and the rapidity of development of the photographic plate must consequently depend upon those laws which govern every chemical process. The first deduction we may make from this conclusion is the fact that the quantity of developing solution does not affect the duration of development, because the insoluble silver bromide and the solution form a heterogeneous system.

The chemical peculiarities of the reducing substance and the concentration and temperature of the solution must also influence the rapidity of development. Certain substances may also affect the duration of development in the same way that the presence of foreign substances may retard or accelerate any chemical reaction. We propose examining these conditions rather more thoroughly in the following remarks.

**A. The Chemical Peculiarities of Developers.**—The various substances which serve as developers in the processes of reduction vary in the intensity of their chemical power, and this may be described as their “strength.” The expression is used, for instance, in relation to acids and is a measure of their affinity to bases. We speak of sulphuric acid as “stronger” than acetic acid, and the expression may be applied in the same way to amidol as compared with hydroquinone. The “strength” of the developer must be distinguished from its “power of reduction.” Dr. M. Andresen recently made a very interesting communication concerning the latter (*Photographisches Correspondenz* 1898, p. 447).

The quantity of silver bromide reduced by a definite quantity of developer is a measure of its “power of reduction” or “reductive value.” The “reductive value” and “strength” of a developer are therefore expressions which resemble the “equivalent” and “strength” of an acid or a base, and, whilst the “reductive value” principally affects the density of the negative, the “strength” governs the rapidity of the development.

Nothing whatever is yet known of the connexion between the chemical constitution and the strength of a developer. In practice we speak of rapid and slow developers, and, by comparing the time of development under similar conditions, numerical expressions may be formulated to indicate the strength of the developer. If, for instance, we take 100 as



expressing the rapidity of development with amidol, we arrive at 25 and 93 as the numbers for glycin and hydroquinone, under similar conditions.

The strength of the alkaline developers depends largely upon their more or less alkaline condition. If it is desired to arrive at the same rapidity with a developer by using different alkalies, their quantity must be determined by assimilating their same alkaline condition. For instance, if we wish to obtain the effect of 10 grammes of potash by substituting caustic soda, the equivalent quantity of the latter (5.8 grammes) should not be used, but preferably a much less quantity, because caustic soda is a much stronger alkali. We find, by experiment, that about 1 gramme of caustic soda is sufficient to produce the same rapidity as 10 grammes of potash.

If the quantity of alkali in the developer is progressively increased, the rapidity increases also. This is at first very marked, whilst further additions tend to a definite maximum. The accession of rapidity follows the same law as that which governs the alkalinity of the solution in its progressive concentration. The alkalinity is proportional to the electric conductivity of the solution, and experiment actually shows that the rapidity of development is inversely proportional to the electrical resistance of an aqueous alkaline solution of the same concentration.

**B. The Concentration of the Developer.**—By diluting an alkaline developer, the rapidity of development falls in proportion to the reduction of alkalinity. The rapidity of a developer diluted with two, three, or four times the quantity of water, is therefore proportional to the electric conductivity of an alkaline solution similarly diluted two, three, or four times. The decrease in rapidity of an iron developer follows a precisely similar law. In this case the reducer is ferric oxalate, and the power of reaction possessed by the solution is proportional to its electric conductivity, as may be seen from the following figures:—

Ferric Oxalate.	Electrical Resistance.	Time of Development.
3 per cent.	24	20 seconds.
2    "	28	29    "
1    "	45	47    "
0.5   "	90	85    "

For facility of comparison the electrical resistance is expressed in arbitrary units.

**C. The Temperature of the Developer.**—Temperature has great influence upon the rapidity of development, and the accelerating effect of heat in developing the photographic image is well known. The time of development diminishes somewhat uniformly with the increase of temperature, within certain limits, as may be seen from the following experiments:—

	Temperature.	Time of Development.
Glycin	12°	138
	17°	104
	22°	60
Amidol	0°	70
	8°	48
	16°	22

By varying the temperature we have an excellent means of altering the rapidity of development without changing the constituents of the developer. If, for example, we reduce the temperature of an amidol developer to 0°, it works with about the same rapidity as glycin-potash at 22° or diogen at 16°. The common opinion that slow developers, such as hydroquinone, lose their power entirely at 0° is not a fact. Hydroquinone at 0° is only about two or three times slower than at 18°.

**D. The Influence of Foreign Substances in the Developer.**—The best-known means, and that most commonly used, for due regulation of the rapidity of development, is the addition of soluble bromides. Their action may be explained by the creation of a tendency to reconstitute bromide of silver. The reductive strength of the developer is thus weakened, and the rapidity of the process of reduction retarded.

These conditions are most apparent in development with oxalate of iron, in which case the potassium ferrous oxalate and silver bromide are converted to ferric oxalate, bromide of potassium, and metallic silver. The three last-named substances have the power to react upon each other and form silver bromide, and consequently cause a tendency to reverse action in the developer. The greater the quantity of ferric oxalate and potassium bromide present in the developer, the slower is the process of development, and, if the quantity reaches sufficient proportions, development is arrested. If either of these ingredients is increased, the intensity of the reverse process will be raised, and it therefore follows that the addition of potassium bromide or ferric oxalate

will retard the rapidity of development. It of course follows that the addition of similar chemical substances must have a like effect, according to their respective affinities. Consequently all the ferric salts, and likewise the chlorides and iodides, act as restrainers.

In the case of the alkaline developers the process cannot be reversed straight away in the manner we have just described, but a tendency to the reconstitution of silver bromide is produced in the course of development by formation of the products of decomposition. The efficiency of the addition of bromide to these developers is therefore lower, and depends upon the chemical activity of the other products of decomposition.

These views explain numerous facts which have been found empirically. Chlorides restrain very little, whilst iodides have very considerable retarding influence upon the developer, because chlorine has little, and iodine great, affinity for silver. Bromide of ammonium has more restraining power than the equivalent quantity of bromide of potassium, because bromine has less affinity for the former. A developer which has been used frequently is slower, because it contains more products of decomposition, and so on.

The restraining action of apparently indifferent substances may also be easily explained upon the ground of our previous inquiries. Glycerine, sugar, salts, organic acids, borax, &c., were known to have restraining properties, but no explanation could be given for the same; but, if the influence of such additions upon the electric conductivity of alkaline solutions is examined, it will be found that they always impede it. The resistance of a one per cent. solution of potash is approximately doubled by the addition of ten per cent. of glycerine or sugar. Probably combinations having the nature of salts, with low power of dissociation, are formed. Such additions consequently diminish the alkalinity of the developer, and at the same time lower the rapidity of the process of reduction.

The salts of the organic acids, as for instance the citrates, have great influence upon the rapidity of pyro development. As such acids are always formed during the oxidation of alkaline pyro, it is possible that their presence in the developer has the same effect as that of the products of decomposition, and retards the rapidity of development for similar reasons.

BARON ARTHUR VON HÜBL.

## COMBINED DEVELOPMENT AND FIXATION.

[Translated from the *Photographische Correspondenz*.]

PUNNETT pointed out that chloro-bromide plates could be simultaneously developed and fixed (see THE BRITISH JOURNAL OF PHOTOGRAPHY, 1898, p. 126). Hanneke has also written concerning similar experiments with bromide plates in the *Photographische Mittheilungen*, 1899, p. 141. The developing power of alkaline pyrocatechin upon bromide of silver is very little affected by hyposulphite of soda, and the quantity of the latter may be so far increased in relation to the former that development and fixation with a single solution may be effected in a few minutes. Theoretically the matter is very interesting. But efforts are now being made, in Germany, I believe, to apply it practically, and under the name of "Elconal F," a strong, concentrated, fixing developer has been placed upon the market and sold in Vienna. Messrs. Ellon & Co. have patented the process, but grant the right to use it to each purchaser of Ellon's pyrocatechin. The formula is as follows:—

No. 1.	
Water .....	250 c. c.
Hypsulphite of soda.....	50 grammes.
No. 2.	
Water .....	75 c. c.
Sulphite of soda .....	30 grammes.
Caustic potash (pure—in sticks) .....	7    "
Pyrocatechin .....	7    "

For developing and fixing a normal plate 18×18 c., take 12 c. c. of developer No. 1, 20 c. c. of fixing solution No. 2, and 30 c. c. of water. The processes of development and fixation are simultaneous. We mention this novelty, as in some quarters it is spoken of as a great advance in photographic development.

In our opinion the new method is very questionable. It is well known that the duration of development must depend upon the exposure, the lighting, and the nature of the subject; also that the temperature of the developer and many other subsidiary circumstances play a part. The fixing process proceeds independently, but the rapid interruption, or the prolongation of the development process, which are such important



factor for the success of a fine negative in the hands of a competent photographer, become an impossibility.

It seems superfluous to demonstrate further to the professional photographer that combined development and fixation cannot be regarded as an advance, and that it is not destined to replace the separate development and fixing processes in applied photography. DR. J. M. EDER.

### THE NASCENT SILVER THEORY ONCE MORE!

(Translated from the *Photographische Correspondenz*.)

THE view that the latent photographic image is due to the formation of nascent silver immediate upon exposure is becoming still more untenable. After the appearance of my two articles containing the arguments against the correctness of the "Nascent Silver Theory," other photographic chemists took up the controversy. Herr Karl Schaum was unable to discover any distinct traces of reduction due to the contact of metallic silver and silver bromide; but, in the case of finely divided metallic silver (Abney's experiment) a slight action of nascent silver is perceptible. I have always considered this reaction as merely subsidiary in the case of silver bromide plates, and at present I am disposed to give it still more subsidiary importance in the production of the developable image. There is, consequently, no contradiction in my views concerning this process, and I agree with Schaum that the production of the negative by development is due to the action of the chemically active rays. As recent experiments have shown, these penetrate thick films of bromide emulsion to a comparatively exceptional extent. My assertion remains unrefuted, that, whatever the substance may be of which the latent primary photographic image is composed, it is quite certain that it cannot be metallic silver, as required by Professor Abegg's nascent silver theory. Moreover, the experiments which Dr. V. Schumann has recently made with gelatino-bromide plates prove that in this case nitric acid does not destroy the image, which I have also proved with collodio-bromide.

"This fact proves conclusively that the latent image formed in gelatino-silver bromide cannot consist of metallic silver."

The contention between me, on the one hand, and Professor Abegg and Dr. Englisch on the other, concerns this point only. The contention has nothing whatever to do with the extent to which contact between metallic silver and silver bromide may influence in a subsidiary way the primary latent image under the action of the developer. The question is clearly and distinctly—

1. Does the primary latent image consist of metallic silver (the nascent silver theory of Professor Abegg and Dr. Englisch, which I hold to be false), or,

2. Does it consist of anything else, viz., silver sub-bromide (the theory which I hold)?

The subhaloid theory is that which I accept and have proved experimentally. It was for Dr. Englisch to prove the contrary. In relation to both these theories, I discussed in my last article the improbability of the theory of molecular transformation of the molecule of silver bromide. As opposed to this, I cited the experiment by which the latent image was destroyed by bromine. I grant that it is possible to harmonise the nascent silver theory with this experiment, but this is out of the question, as it is upset by the nitric acid experiment. It is therefore an oversight on the part of Dr. Englisch if he thinks that the bromine experiment was brought forward "to save the subhaloid theory." The bromine experiment is inapplicable to it, but at the same time it is not contradictory. The sub haloid theory is not, however, in need of rescue, as it does not yet stand in any danger of the untenable nascent silver theory.

The support of the silver haloid theory is the nitric acid experiment, and this has not been weakened by any of the followers of the nascent silver theory. Neither have they sought so to do, which is the only means by which the latter theory could be saved. The subhaloid theory is founded upon experiment, it agrees best with all observed phenomena, and the defenders of the nascent silver theory who oppose it cannot say the same of that for which they are contending.

DR. J. M. EDER.

### ON THE ACTION OF LIGHT ON THE SALTS OF COBALT.

#### PART VI. EXPERIMENTS WITH COBALTIC MOLYBDATE.

COBALTIC hydrate, even when in a freshly precipitated state, seems to be incapable of combining directly with molybdic trioxide to form a soluble molybdate. On boiling a mixture of the hydrate and trioxide in the requisite combining proportions in the presence of water, the former exchanged its deep brown colour for a dingy reddish-yellow, and assumed

a more flocculent form. After allowing the insoluble matter to subside, paper was coated with the supernatant liquid, dried in the dark, and exposed under a negative as usual. Seventy-five hours' printing in a good light failed to produce an image, whilst treatment in the ferricyanide bath afforded no more successful result. These facts were taken to indicate that no molybdate, or, at all events, no more than a trace of such, was present in the paper—a conclusion confirmed by subsequent inquiry.

It was accordingly found necessary to prepare the molybdate by double decomposition. For this purpose the following process was resorted to: An aqueous solution of cobaltic tartrate, slightly acidified with tartaric acid, was mixed with one of potassium molybdate, and the mixture, after being well stirred, was allowed to stand for a few hours to permit of the sparingly soluble potassium hydrogen tartrate separating out. The clear solution of the cobaltic salt was then decanted off, and paper sensitised therewith and dried in the dark. On exposing a strip of this paper under the solar spectrum for thirty hours, a distinct band of a pure yellow colour was impressed by the yellow rays, but all rays of a greater or less degree of refrangibility than the yellow seemed to possess no actinic influence, as beneath them the remaining portions of the strip retained their original white colour. A moderate increase in the duration of the exposure served to intensify the depth of the yellow colour. An excess of exposure seemed to be productive of a bleaching or secondary action. The latter, however, was of a very feeble character, as may be judged from the circumstance that, after considerably more than 100 hours had elapsed, the yellow band was still perfectly distinct. In the course of a few hours more the strip was removed and transferred to a bath containing a weak aqueous solution of argentic nitrate.

The yellow band was gradually bleached, and, in a short time, entirely destroyed, the strip now appearing in its original whiteness throughout its entire length. A second strip of the sensitive paper was next exposed in the spectrum slide for forty-five hours, by which time the yellow band had attained pretty nearly its maximum intensity. On developing this print in the usual aqueous ferricyanide bath, a new image of feeble intensity and purple-red colour revealed itself, the details of which, in so far as they were found to lend themselves to reproduction, are represented

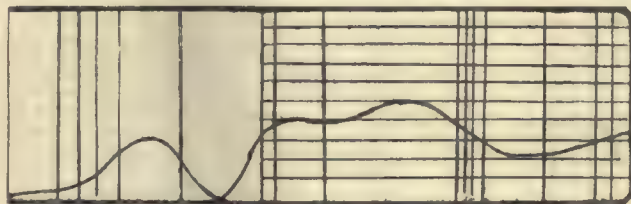


FIG. 18.—COBALTIC MOLYBDATE.

in fig. 18. The predominant influence exercised by the blue rays, extending with slightly diminished power into the region of the green, is here very noticeable. So, too, is the comparatively strong action due to the orange, and the absence of any action in the yellow rays. With reference to the latter, the attention of photographers is called to the fact that the molybdate, like the hypothetical chlorobenzoate described in the previous article, is sensitive to two groups of selected rays, the one set producing the visible and the other the latent or invisible image. What is still more remarkable is that in both the instances cited we find that the rays of each group are apparently mutually exclusive, no single group of rays being common to both groups. To take the case of the molybdate, the primary image, i.e., that due to "printing out," is due to the yellow rays, and all rays but the yellow are without photographic action.

Conversely, the latent image formed simultaneously with the visible yellow band is, in its turn, due to the impact of all the rays of the spectrum except the yellow, the latter having apparently been deprived of further chemical power on bringing about the molecular transformation, of which the visible image is the tangible result.

Did space permit, a curious parallel might be established between these results and certain closely related phenomena, partly optical, partly chemical in character, of which the various investigations dealing with the reversal of the Fraunhofer lines of the solar spectrum, and Bunsen's classical researches on the relations existing between the emissive and absorption spectra of the salts of didymium and the so-called erbium, afford instances that will readily be recalled by students of science. Apart from its bearings on matters of theory, the circumstance that the yellow rays of the spectrum act on cobaltic molybdate to produce a yellow-coloured compound is interesting in view of the purpose which this property might be made to serve in heliochromic photography. Were it possible by any means to increase the sensitivity of the molybdate to luminous action, the selective property of the salt might be utilised in the camera as a means of producing a yellow image, due solely to the yellow wave-lengths of the object to be depicted.

The chemical composition of this yellow body has not been ascertained. It seems improbable that it is cobaltous molybdate, for when a cobaltous salt is treated with a solution of potassium or sodium molybdate, though



at first no precipitate is produced, upon allowing the mixture to stand for a few hours, what would appear to be the compound in question is deposited in the form of an amorphous violet-coloured mass.

#### EXPERIMENTS WITH COBALTIC PERSULPHOMOLYBDATE.

A solution of potassium persulphomolybdate was prepared by passing sulphuretted hydrogen through an aqueous solution of potassium molybdate. After filtering, a portion of the clear crimson solution was added to an equal volume of a solution of the requisite quantity of acidified cobaltic tartrate, and the mixture was stirred and allowed to stand until quite clear. Paper was then sensitised with the cobaltic salt thus formed and dried in the dark. It should be added that during the preparation of this compound a small quantity of sulphide of cobalt was also formed, due to the action on the tartrate of a little free sulphuretted hydrogen obstinately retained by the solution after saturation with the gas. The sensitised paper, which was of a vivid dried yellow-brown colour, was duly exposed under a negative in sunlight, and in the course of three hours a positive image in faint outline was just perceptible, the hue inclining to an orange or orange-brown. A second sheet was exposed in the spectrum slide for a similar period. The resulting image was exceedingly weak, and seemed to be due to the green, the red, the orange, and the yellow rays, the first-named having impressed themselves with the greatest force, whilst the minimum point seemed to be situated about midway between the maximum point and the end of visible red. The spectrum slide was then replaced in the camera, and the print again exposed to light. Little change, however, was produced, and none in the direction of a gain in the intensity of the deposit, the image, after an exposure of seventy-five hours in all, being decidedly weaker than when first examined. The strip was next divided longitudinally into two parts, one of which was then treated in the ferriyanide bath, and the other in a bath containing a weak solution of argentic nitrate. No alteration was effected in the appearance of the image in the case of the former.

In the nitrate bath, however, a rich deep brown image was obtained in the course of a few seconds. A careful scrutiny of the print after development revealed the fact that the silver solution had acted simply



FIG. 19.—COBALTIC PERSULPHOMOLYBDATE.

as an intensifier, the outlines of the colour bands and their relative intensities being coincident with those of the visible image. Fig. 19 gives a fair idea of the character of this spectrum. It is curious to note that the chemical action is practically confined to the less refrangible end, the outward boundaries of the green region marking its limits.

#### EXPERIMENTS WITH COBALTIC ARSENIATE.

This salt was prepared by double decomposition by the addition of a solution of potassium arseniate to one of cobaltic oxalate. The sensitised paper, after drying, was of a greenish-yellow colour. One of the sheets was exposed to light under a negative, and another in the spectrum slide.

These were examined from time to time during the course of the exposure, but on neither could any signs of an image be traced. At the expiry of seventy-five hours they were removed, divided into two parts, and a pair of odd halves were then transferred to the usual ferriyanide bath. The process of tentative development lasted about thirty minutes, but no image resulted in either case, nor was there any change in the appearance of the paper indicative of chemical action.

The remaining halves were in turn developed in a second bath containing a very weak solution of argentic nitrate. Both during and after development the deposit of argentic arseniate formed by the action of the bath was very carefully examined, but not the slightest indication of an image could be detected on either, the red precipitate being distributed over the surface of the paper with perfect uniformity.

These experiments would seem to indicate that cobaltic arseniate is not sensitive to the action of light.

Confirmatory evidence is, however, required to decide this point, and the subject merits further investigation.

#### EXPERIMENTS WITH COBALTIC ARSENITE.

Some freshly precipitated cobaltic hydrate was placed in a test tube containing water and arsenious oxide. On boiling the mixture, a solution was obtained, though with some difficulty, as the hydrate dissolved very slowly, leaving a residue which resisted further action and had to be filtered off. Paper was coated with the filtrate, dried, and exposed

under a negative in sunlight. After three hours had expired, the high lights of the picture were just rendered perceptible, being outlined in unchanged white upon a pale yellow ground. On increasing the exposure, little change was at first apparent, but afterwards a bleaching action set in, and in from seventy to seventy-five hours from the beginning of the printing process the image had quite disappeared. An attempt was then made to revive it by development in the ferriyanide bath, but this was not attended with success. A second portion of the sensitised paper was next exposed to light in the spectrum slide. In three hours' time a faint but perfectly distinct band was visible under the yellow rays, and there were also indications of bands in the red and the orange, these latter being, however, of a more dubious character. On increasing the exposure, the bleaching action again supervened, and the image, after the lapse of seventy-five hours, was, as before, rendered invisible. On removing the print from the camera, it was immersed in the very weak silver bath employed in the experiments with the arseniate. After a lengthy development, the band marking the position of the yellow rays was restored to view, but nothing could be seen of the bands due to the action of the red and the orange rays.

It was noted, too, that the visible band was fainter than when first seen, and also that it had undergone a transformation in hue from yellow to orange.

#### EXPERIMENTS WITH COBALTIC ORTHOPHOSPHATE.

Paper was sensitised by coating with a solution of cobaltic citrate to which the necessary proportion of a soluble phosphate had been added, the salt chosen for this purpose being disodic orthophosphate. A portion of the dried paper was exposed in sunshine under a negative. Though the printing process was unusually protracted, not the slightest trace of an image could be perceived at any stage of the operation. A second sheet, however, which had been exposed to the rays of the spectrum for only three hours, gave an image of feeble character and purple colour by development when treated in a ferriyanide bath, acidified with a few drops of weak acetic acid.

This image is graphically represented in fig. 20. The action here is

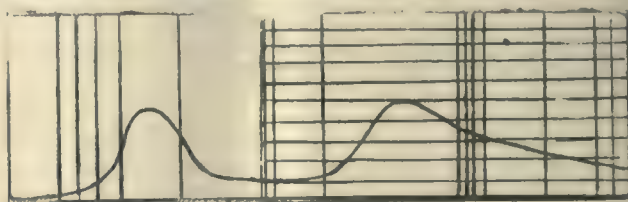


FIG. 20.—COBALTIC ORTHOPHOSPHATE.

due mainly to the blue and the orange rays, the rays of an intermediate order of refrangibility exercising hardly any chemical influence.

In the next experiment a portion of the paper was exposed for twenty-five hours to the rays of the spectrum.

No visible impression having been produced, the sheet was divided into two parts, one of which was then immersed in an aqueous solution of mercurous nitrate. This treatment, however, occasioned no change in the appearance of the print, nor did the subsequent addition of a solution of lead nitrate to the bath act as a developer of the latent image.

The other half was treated in the usual neutral ferriyanide bath.

The result was fairly satisfactory, a strong impression of a band marking the position of the green rays of the spectrum being obtained without difficulty. No certain indications of action due to the other rays could be perceived, but the strip throughout its length was uniformly tinted a very delicate sea green. On acidifying the bath with acetic acid, the band in the green was destroyed, the paper being bleached. In the fourth experiment, after an exposure of thirty hours in the spectrum slide a solution of lead nitrate made slightly alkaline with ammonia was employed as a developer. No change being perceptible, the print was rinsed in water and transferred to a very weak solution of potassium bichromate. The yellow precipitate of chromate of lead now formed was very carefully examined, but there was an entire absence of markings that could be attributed to the action of the spectrum.

An increase of five hours having been made in the exposure of the next sheet, the print was developed in a neutral bath of potassium ferriyanide. The strip was speedily dyed a purple-red from end to end, the depth and intensity of the colour deposit being apparently the same at all points of the spectrum band.

A sixth sheet, exposed to the light of the spectrum for fifty hours, on being treated in the same way, afforded a similar result, the purple colour due to the change effected by the active radiations being now, however, considerably intensified. These results lead us to the important and unexpected conclusion that the orthophosphate, when first exposed to light, is sensitive to a few definite isolated groups of wave-lengths, by the continued impact of which it is slowly decomposed. When, however, the exposure reaches a certain point, the decomposition is greatly accelerated, the change being now no longer effected by a mere selection of wave-lengths, but by every ray of the spectrum alike, the upshot of which is, of course, the production of the same intensity of chemical action at each point where there is luminiferous impact.



Two experiments made with this salt belonging to a slightly different category may be briefly noticed. The first was made by wetting a sheet of the sensitised paper with a weak solution of sodium carbonate rendered strongly alkaline with ammonia. On exposing this in a damp state for one hour in sunlight under a negative, an exceedingly weak outline in purple of the brighter portions of the picture was obtained. The deposit forming this image was very similar in appearance and properties to that of cobaltous orthophosphate as precipitated from a soluble cobaltous salt, and it is not unlikely that it may have consisted of a mixture of that compound with cobaltous carbonate and hydrate.

In the second experiment the sensitised paper was coated with a weak solution of potassium dichromate, and, after drying, exposed to light under a negative for twenty hours.

No image was obtained, but the yellow colour due to the dichromate was gradually bleached, the paper ultimately becoming perfectly white. A ferrous-oxalate developer was then applied, but no visible change ensued beyond a slight darkening, which was clearly attributable to the action of the iron compound upon the phosphate.

#### EXPERIMENTS WITH COBALTIC PYROPHOSPHATE.

A sensitising bath was prepared by double decomposition, the salts employed for the purpose being sodium pyrophosphate and cobaltic citrate. A sensitised sheet, after drying, was exposed to the rays of the spectrum for three hours.

On development in the ferricyanide bath a very delicate tint was produced, the uniform character of which seemed to show that the change effected was not due to the action of light. The next sheet, on being exposed for twenty-five hours, was divided into two parts, and the first half developed in the mercurous nitrate bath, lead nitrate being again added during the course of the operations. As in the case of the orthophosphate, no image was produced. The remaining half was then immersed in the ferricyanide bath. After a few minutes had elapsed, indications which were presumed to be due to an image made their appearance, but so exceedingly faint were they that no certain conclusion could be drawn. On acidifying the bath with a little acetic acid they entirely disappeared. A third sheet, which had meanwhile been exposed in the spectrum slide for thirty hours or thereby, was developed in the lead nitrate bath, and afterwards treated with a weak solution of potassium dichromate. Neither of these operations revealed any action that could with probability be held to show that development had taken place.

In the fourth experiment a neutral ferricyanide solution was substituted for the lead bath, and on immersing the print (which had received an exposure of thirty-five hours) a pink deposit was again produced very similar in character to that obtained in the first experiment, the depth of colour being in no wise greater.

Finally, a sheet of the sensitised paper was exposed to the spectral action for fifty to sixty hours. On being removed to the ferri-

ngly, a quantity of freshly precipitated cobaltic hydrate was digested for several days in a moderately strong solution of metaphosphoric acid. As a safeguard against the formation of orthophosphoric acid, no heat whatever was applied during the process of digestion. After filtering off the insoluble residue, paper was coated with the pink solution, dried in the dark, and exposed to the action of the spectrum. When forty-five hours had elapsed, it was removed from the slide, no image being then perceptible, and immersed in the ferricyanide bath. A rather feeble purple-red image resulted, the details of which it has been attempted to reproduce

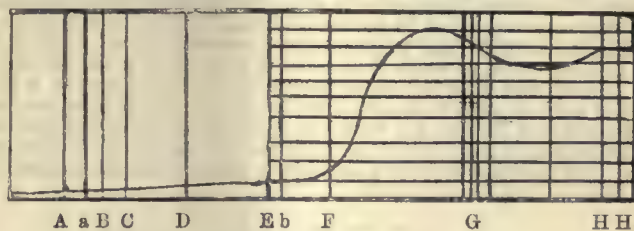


FIG. 22.—COBALTIC METAPHOSPHATE.

in fig. 22. In the print itself the relative intensities of the rays at the more refrangible end could be determined without difficulty, but at the opposite end the red deposit was too slight to permit of more than an approximation being made as to the influence exercised by the rays lying in that quarter. The fact, however, was evident that the maximum action was due to the blue rays, beyond which a slight diminution of intensity was noticeable in the region of the indigo rays, and a corresponding increase in that of the violet.

In sensitiveness to light the metaphosphate would seem to occupy an intermediate position in the group to which it belongs, being less sensitive than the orthophosphate but more so than the pyrophosphate.

#### PRINTING DRAWINGS BY MEANS OF PHOTOGRAPHY.

HERR AUGUST SCHWABZ points out that the difficulty attendant upon the use of artificial light for the purpose of the production of photographic prints of large drawings is that the rays do not run parallel as is the case with sunlight, but proceed radially from a point, and in consequence the surface of the sensitised paper or film is not regularly illuminated. The employment of reflectors to obviate this difficulty is only possible for

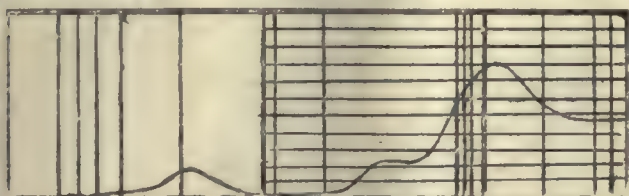


FIG. 21.—COBALTIC PYROPHOSPHATE.

cyanide bath, an immersion of a few seconds sufficed to develop a vigorous purple or plum-coloured image, exhibiting the series of bands shown in fig. 21.

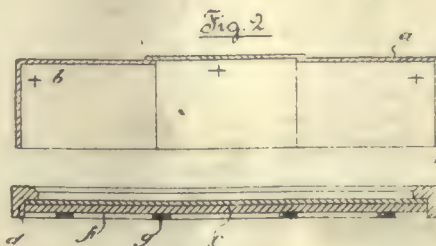
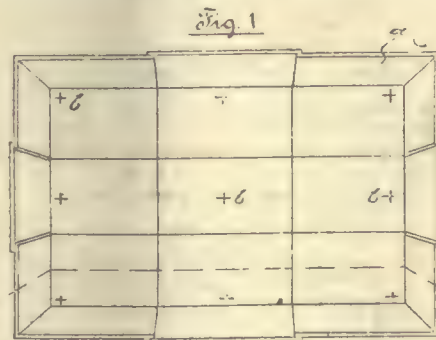
As a confirmatory test, a second sheet was exposed in the slide for a like period and developed in the same solution. The resulting print was in all respects similar to the foregoing. The action, as will be seen by referring to the diagram, is most powerful in the region of the indigo rays. The violet rays, however, are potent in a less degree, whilst the blue rays, and even the yellow, are not without a slight share of influence.

On the whole, the evidence tends to show that the pyrophosphate is considerably less sensitive to light than the orthophosphate. Judging from the results of the first and fourth of these experiments, it would also seem probable that it is one of that class of inorganic cobaltic salts already alluded to, the members of which undergo gradual decomposition, not only in the light but also in perfect darkness.

#### EXPERIMENTS WITH COBALTIC METAPHOSPHATE.

An attempt was at first made to prepare this salt by double decomposition, paper being treated with successive washes of solution of cobaltic oxalate and potassium metaphosphate. After drying, two sheets were exposed in succession, the one to the action of the spectrum and the other beneath a negative in diffused daylight, the exposure in each case being forty hours. In neither case was a visible image produced, nor was any latent image developed when the prints were treated in a neutral ferricyanide bath.

It was then decided to prepare the metaphosphate directly. Accord-



small surfaces, as the source of light must be as near as possible to the sensitised paper or film. Consequently, nothing further remains for the production of larger copies than the arrangement closely together of a great number of lights, which, of course, has the disadvantage of too great expense.

His invention consists in the employment of an open shell of any shape, having its interior enamelled a dull white, and having its interior approximately of the same size as the drawing to be copied, and the



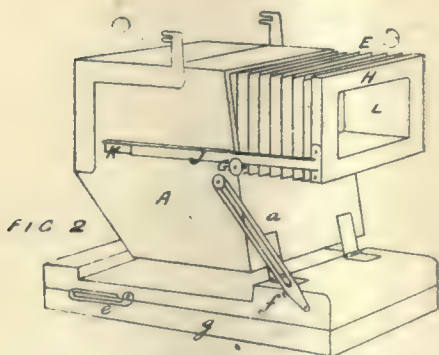
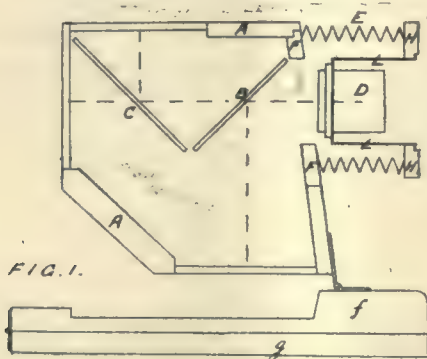
arrangement within such shell of a number of sources of light close to the interior face of the shell, and the arrangement of the copying frame in front of the open part of the shell. The interior of the shell is regularly illuminated by means of the lights, and reflects light equally upon all parts of the copying frame.

The shell, *a*, is enamelled or painted dull white within, and is constructed with its respective faces of one sheet of metal, or, as illustrated, it may be constructed of several metal plates, which may be riveted or otherwise secured together to form a staunch construction. Lights, *b*, indicated by crosses, are arranged in proximity to the rear interior face of the shell, and these may be arc lamps, incandescent electric lamps, or mantles, or acetylene gas flames, or other source of light. *d* (fig. 2) is the copying frame, in which is mounted a glass plate, *c*, behind which the drawing and sensitised paper or film are held by means of a felt padded wooden plate, *f*, pressed home by means of transverse bars, *g*. The distance, *e*, between the shell and the copying frame, prevents the undue heating of the glass plate, *c*, and serves for the purpose of observation. The shell and copying frame may be mounted, one in relation to the other, as may be convenient.

### CAMERA FOR THREE-COLOUR WORK.

MR. WALTER WHITE has patented an improved camera for three-colour work:—

He says: "I so construct a camera, or apparatus, that it shall have means of adjustment suitable for employing according to the height or direction of the source of light and the position of the observer's eye when the apparatus is used as a viewing instrument, the said apparatus being also easily convertible into a camera for producing the three negatives simultaneously. When used as a camera, an improved arrangement for focussing is employed, and the use of lenses of shorter focus than it has hitherto been possible to make use of is rendered practicable. The colour screens employed for negative-making may be



employed for viewing, with the aid of an additional screen to control them.

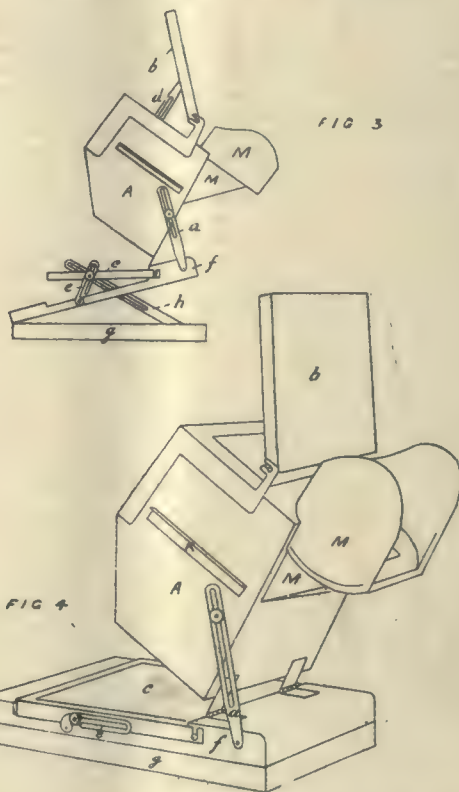
"The apparatus consists of a casing or body, *A*, constructed to carry three sensitive plates or transparencies, and containing two transparent mirrors, *B* and *C*, at an angle of  $90^\circ$  to each other, so disposed as to reflect images upon two sensitive plates, or from two transparencies, placed at the upper and lower sides of such casing, each mirror being at an angle of  $45^\circ$  to the focal plane, or third plate, or transparency.

"For the production of negatives, the apparatus is fitted with a lens, *D*, as for ordinary photography. A bellows front, *E*, is attached to the casing by a frame, *F*, carrying such bellows, arranged to fit in position, and held in place by turn buttons or other suitable means. This frame

carries a pinion, *G*, projecting horizontally beyond the two sides of the casing. The frame, *H*, at the opposite or front end of bellows, carries at each side a length of rack, *J*, which rests upon and is worked by the pinion affixed to the back frame. The rack moves under a guide, *K*, or between two guides affixed to each side of the casing. A piece of single or double angle metal forms a suitable guide.

"In the opening of the front frame of bellows is inserted a box or chamber, *L*, preferably constructed of thin metal and open at the front. This occupies the space in the interior of the bellows, and carries at the back the lens that is to be employed.

"The transparent mirrors contained in the body of the apparatus may be of yellow or orange or red glass. The first mirror, *B*, or that nearest the lens, may be of yellow glass, and reflects an image downwards upon a sensitive plate at the bottom of the casing. The second mirror, *C*, may be of orange or red glass, and reflects an image upwards upon a second sensitive plate at the top of the casing. The third sensitive plate at the back or end of the apparatus, as in ordinary photography, receives an image direct from the lens, the light passing through the two mirrors. Colour screens are used in front of some or all of the sensitive plates, their colour being such that the negatives obtained upon the three plates represent the three primary colours or colour sensations, and that the coloured light passing through them, when the apparatus is used as a



viewing instrument, reproduces in each case one of the three primary colours. To secure this result, additional colour screens may be used in negative-making or viewing to ensure the correct photography of the colours, to equalise the exposure of the three plates, or to absorb such colours as may require eliminating for viewing purposes.

"I preferably fix screens suitable for negative-making in the apparatus, and control their colour for viewing purposes by a screen at or near the eyepiece, this being of such a colour as will absorb wholly or in part such colours as may be incorrect or of too great brilliancy.

"The casing or body is hinged preferably at the front lower edge, that is, the lower edge of the end to which the lens or eyepiece is attached, to a base, so as to be movable upon a horizontal axis, a slotted strut or arm, *A*, pivoted to the base serving in connexion with a set screw on the body to adjust the latter to any required angle. When the apparatus is used as a viewing instrument with three transparencies, the bellows front, carrying the lens rack and pinion, is removed, and a silvered mirror at an angle of  $45^\circ$  reflecting the image upwards at an angle of  $90^\circ$  is substituted, a magnifying eyepiece being affixed, *X*. To the upper side of the casing is attached a reflector, *B*, and to the lower side of the casing, or to the upper part of the base, another reflector, *C*, each movable upon a horizontal axis. The body of the apparatus is then pointed upwards, towards a bright sky or other suitable source of light. The mirrors at the upper and lower sides of casing are adjustable by means of a slotted strut and set screw in each case, *d* and *e*, so as to

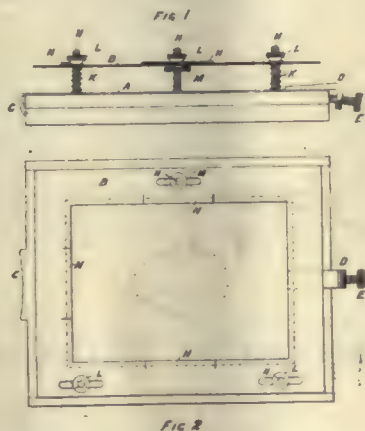


properly illuminate the upper and lower transparencies. These mirrors are removable when the apparatus is used as a camera. The base of the apparatus is made in two parts, the upper part, *f*, being hinged or attached to the lower, *g*, so as to be movable upon a horizontal axis at the back end of the base, that is, the end furthest from the observer when viewing. A slotted strut and set screw, *h*, enable this to be adjusted at any required angle, either for raising the apparatus or for adjusting its position in regard to the source of light.

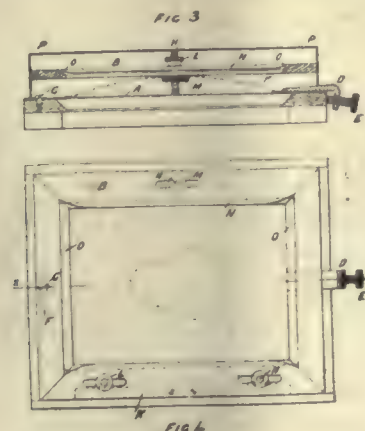
"The apparatus may be either single or stereoscopic. In the latter case, two lenses are preferably employed for negative-making, and stereoscopic lenses for viewing, the apparatus being made of such width as will allow of the use of plates to give the required pairs of negatives and of transparencies consisting of stereoscopic pairs of images."

### SOUTHIN'S VIGNETTING APPARATUS.

This consists of two thin plates or frames, *A* and *B*, of suitable material, about the size of an ordinary printing frame, with rectangular openings a little smaller than the size of the negative. The bottom plate, *A*, rests on the top of the printing frame, and has a clasp, *c*, at one end of it, and a bent arm, *b*, with a milled-headed fixing screw, *x*, at the other end. A slot, *r*, and screw, *c*, may be used instead of the clasp, *c*. This bottom plate is moved horizontally across the printing frame, and can



be instantly secured to it by the fixing screw, *x*. Screwed studs, *n*, are riveted to this bottom plate, and the top plate, *B*, falls on these studs, the top plate being slotted to allow it to move freely in one direction on the studs, this direction being in a transverse direction to the movement of the bottom plate. A spring, *x*, or springs, flat or spiral, are fitted between the top and bottom plates or frames. Milled-headed nuts, *L*, are fitted on the screwed studs above the top frame; these springs and nuts are for the purpose of raising or lowering the top frame to any



suitable height. A locking nut, *x*, is fitted to one of the screwed studs between the frames, *A*, *B*, this locking nut and the milled-headed nut above it instantly securing both the upright and lateral movement of the top frame. The top frame holds the vignetting card. This frame can be made of any suitable material. When made of a flexible material, portions of the plate are bent or moulded to form grooves, *n*, for the insertion of the card.

When made of wood, the cards run in grooves, *n*, in the frame, and are held securely by the bevels, *o*, on the inside of the frame, which bend up the end portions of the cards.

The cover lid, *p*, is employed to cut off all light but that which passes through the opening in the vignetting card. A light diffuser or filter is attached to the top frame, consisting of a sheet or sheets of transparent or coloured flexible material larger than the vignetting card, with a number of eyelet holes, loops, studs, or catches in it for the purpose of readily attaching it to or detaching it from the top frame, which is fitted with studs, holes, or catches for this purpose. It can also be attached to any ordinary printing frame in a similar manner and for a similar purpose.

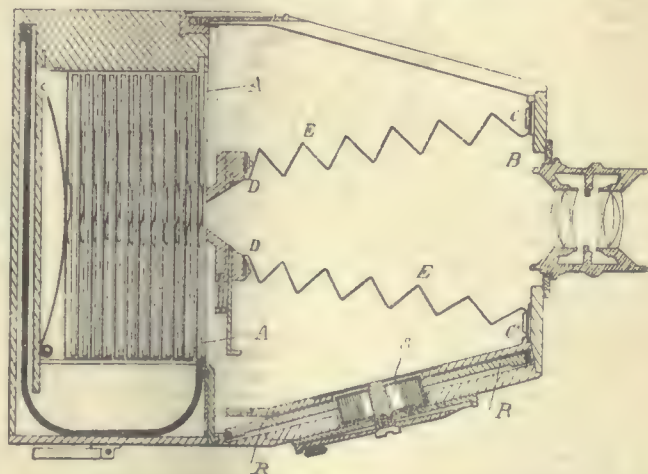
### A NEW CAMERA.

MONS. J. G. SIEGRIST has designed a camera which, by means of a non-actinic envelope, can be adapted to "allow the actinic rays from the lens to pass by means of a movable slit orifice, which can be operated, by any convenient means, extremely close to the sensitive surface, and parallel to the same, without in any way injuring it."

This parallel movement can be effected in a variety of ways. Mons. Siegrist proceeds: "The method I have indicated in the accompanying drawing for moving the slit device is based on the transmission of the motion of a grooved pulley, *n*, by means of a cord or thread attached thereto, and passing round a small guide pulley so situated as to lead the cord to the slit device, which latter is guided in its movement of alternative disposition by any convenient means, so as to maintain its parallelism with the sensitive surface.

"I obtain thus a great speed of exposure.

"The plate or sensitive surface, *A*, being in practice always at the same distance from the back part of the lens, *n*, of the camera, it follows there is the necessity of having the special non-actinic envelope herein-after described in order not to interfere with the parallel movement of



the slit device to the plate, and to shield the plate from light other than passes through the slit.

"The essential features of the slit device are as follows:—

"My non-actinic envelope is formed of a quadrilateral or any other geometrical form, and is fixed, at *c*, to the interior of the side or end carrying the objective, *B*, the axis of which coincides with the centre of the quadrilateral figure. The other extremity of my envelope is fixed to the slit device at *d*.

"I have thus an envelope fixed by one of its ends, and adapted at its other end to be moved to a fixed distance in a plane parallel to the plates. This effect is produced with my non-rigid envelope, by reason of it being made with deformable, extensible, and contractible walls, these deformations, extensions, or contractions being brought about by the slit device in its displacement. In a word, my envelope, to respond to the definition hereinabove described, will be a photographic bellows, of which the forms and dimensions will be determined by the forms and dimensions of the boxes, of the lens, and of the slit device, on which it is fixed by its two extremities.

"In the middle position represented by the drawing, the side parts, *x*, *x'*, of my non-actinic envelope will be of equal length.

"The slit device in descending will contract or fold on itself at the part, *m*, and simultaneously develop or elongate the part, *x*. The inverse effect is produced when the slit device reascends. Nevertheless, one can insert in the middle of this envelope a rigid partition more or less extended, the importance being that the qualities of non-rigidity, of extensibility, and of contractibility—in a word, of deformation—is obtained at the two extremities fixed against the lens and the slit device.



"The pulley wheel, n, is operated by means of a spring barrel, s, or other equivalent means. The slit device is pulled down to the bottom of the camera by any suitable means, such as a cord attached thereto, and is retained in the set position by a detent or stop. When the exposure is to be made, the detent is released, and the spring barrel draws the slit device up across the plate or other sensitive surface by means of the cord.

### "VICOL."

The specification of this "colour" printing process, which is the invention of Messrs. T. T. Baker and M. S. Berger, is as follows:—

Add litmus, in preference powdered litmus, to water in proportion of about 1 ounce of litmus to about 6 ounces of water, then boil the mixture until the litmus is dissolved. When cold, filter the solution of litmus and mix it with the sensitive emulsion or solution in the proportion of about 40 parts of the litmus solution to 60 parts of the sensitive emulsion or solution the depths of the tints subsequently obtained varying with the proportion, of the litmus solution to the sensitive emulsion or solution. Apply by means of a roller or other convenient method the mixture of litmus solution and sensitive emulsion or solution to the surface of the material to be coated with it, thereby making a photographic printing surface on which photographs can be printed and finished off in the usual manner. Apply to the whole or any part of the surface of the printed photograph, with a camel's-hair brush or other suitable means, an acid or acid substance, by preference a five per cent. solution of citric acid, when a red or pink tint will be produced; or apply in like manner an alkali or alkaline substance, by preference a five per cent. solution of caustic soda, when a blue tint will be produced.

### A DISTINGUISHED LADY PHOTOGRAPHER.

In an illustrated interview with Madame Garet-Charles in the *Young Woman* for August, we are told that three years ago this successful photographer had practically no knowledge of photography, yet to-day she stands in the very front rank. She states that she has never advertised her work, her studio is in her own home (a house in the north-western quarter of London), and she received no training. "I began very comfortably," she says, "never taking photographs except by appointment, and never letting my work fall below a rather high standard; but it has meant a great deal of real hard work, and I have more than once been busy with my plates till past midnight; so that, physically, perhaps it is not quite the best profession for a woman. But the woman who is prepared to work hard, and is qualified in every other respect, may do very much worse than become a photographer. There is a good deal more in the art of photography than most people imagine. It is not merely the taking off and putting on of a cap. Even the character of the photographer has something to do with the work. To take a really successful photograph, you must have a personality. You must be pleasant, look cheerful, and make your sitter perfectly at home. Let there be as little form as possible, and absolutely no stiffness. I know photographers who prop the sitters up against a lot of furniture. That, to my mind, is exactly how not to take a photograph. Let your sitter be perfectly natural, have a quick eye for a good expression, and at that moment seize your opportunity. You must be very quick, you must have great tact, and, above all, you must never appear to be in a hurry. Let the sitter think that time is of no consequence."

Madame Garet-Charles never, or hardly ever, takes men. "The only man I ever wanted to take was Lord Kitchener," she says, "and I could not get an opportunity. But, generally speaking, I am not interested in men—as a photographer, I mean; so I leave the men to the men, and I think the men should leave the women to the women. A woman is a much better woman's photographer than a man. She has naturally a much better idea of what is natural and becoming in a woman. It is rather hard on the men, I admit, seeing that women are the best—practically, in many instances, the only—patrons. A man rarely has his photograph taken unless his wife or his lady friends make him, but a smart woman gets photographed every few months; she goes to her photographer as regularly as she goes to her dentist.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, August 23, at eight o'clock. Discussion, "Does Photography Benefit by Awards of Judges who are not Photographers?"

The *London Gazette* announces that, by Order in Council, the provisions of the International Copyright Convention will extend to Japan from the 15th ult., and to Montenegro from April 1 next.

THE latest Convention photograph to reach us is a 12×10 enlargement from a three-and-a-half-inch negative, on the Wellington film, by Mr. A. H. Ward, of Messrs. Wellington & Ward, Elstree. It is a group of the Convention Council, and our thanks are due to Mr. Ward for enabling us to add the picture to our collection of Convention mementoes.

THE Research Fellowships founded by the Salters' Company and the Leather-sellers' Company for the encouragement of higher research in chemistry in its relation to manufactures, tenable at the City and Guilds Central Technical College, being now vacant, the Executive Committee of the City and Guilds of London Institute will, before the commencement of next session, consider applications and elect candidates. The grant made by each of the Companies to the Institute for this purpose is 150*l.* a year. Copies of the scheme under which the Fellowships will be awarded may be had on application to the Hon. Secretary of the Institute, Gresham College, London.

CALCIUM CARBIDE FACTORIES IN NORWAY.—With its many waterfalls and a plentiful supply of chalkstone in some localities, Norway would appear to be more favourably situated, with regard to the production of calcium carbide, than countries where steam (and not water) has to be used to produce the necessary electric power. H.M. Consul-General at Christiania reports in a despatch, dated June 8 last, to the Foreign Office, that two calcium carbide factories have started work in Norway. The larger, of 3000 horse power, is situated near Hafslund; the smaller, of 1500 horse power, near Borregaard, facing each other on either side of the Sarpsfoss waterfall, above Fredrikstad. It is stated that the Hafslund factory is shortly to be increased to 5000 horse power. It has been built by the Electricitets Aktieselskab (formerly Schuckert & Co.), Nürnberg. Other factories are now in contemplation.

"ONE-AND-ALL" INTERNATIONAL EXHIBITION OF HORTICULTURAL PHOTOGRAPHS.—We have received the schedule of prizes to be given at this Exhibition, which will be held at the Crystal Palace in August 1900. The great success which attended the Exhibition of Horticultural Photographs held at the Crystal Palace during the week ending August 19, 1899, has determined the Association to greatly extend the 1900 Exhibition, and make it of a thoroughly international character. A minimum issue of 20,000 schedules of prizes will be printed. Ten thousand of these will comprise the English edition, and will be sent to leading photographers and horticulturists, not only in the United Kingdom, but in the United States of America, Canada, Australia, Africa, and to all other important countries where the English language is spoken. The remaining 10,000 copies will be divided into editions printed in French, German, Spanish, and Italian, and will be sent to the same class of people in those countries and their dependencies.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
22.....	Hackney.....	Exhibition of July Excursion Prints.
23.....	Manchester Amateur.....	Excursion: Gisburn. Leader, J. C. Hope.
23.....	Photographic Club.....	{ Discussion: Does Photography Benefit by Awards of Judges who are not Photographers?
23.....	West Surrey.....	Open Night.
26.....	Birmingham Photo. Society ..	Excursion: Fladbury. Leader, L. Lloyd.
26.....	Darwen.....	Excursion: Worston and Downham.
26.....	Hackney.....	{ Excursion: Landon Hills. Leader, A. D. Fort.
26.....	West London.....	Excursion: Richmond Park.

### PHOTOGRAPHIC CLUB.

AUGUST 9.—Mr. J. Nesbit in the chair.

Discussion took place upon the previous week's proceedings, Mr. Foxlee showing a further test he had made with a solution of kochin that had been previously used and kept, one half of a plate having been developed with fresh solution, taking two and a half minutes, the other, with old solution, taking eight minutes, the result being that the latter was denser and somewhat harder. It was agreed that the old kochin solution gave a similar result to that of an old metal solution.

The Hon. Secretary showed three X-ray negatives of a child's hand with the bone of the first finger broken.

Mr. W. D. Welford showed a blokam, and explained the various manipulations in working same. It was acknowledged to be an extremely well-made and ingenious apparatus and well worth the price asked for it by the makers.

### FORTHCOMING EXHIBITIONS.

1899.

August ..... One-and-All Flower Show at the Crystal Palace (Photographic Classes). Hon. Secretary, E. O. Greening, 3, Agar-street, Charing Cross, W.C.

Sept. 22–Nov. 4 ..... Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.



- Sept. 25-Nov. 11..... Royal Photographic Society. Hon. Secretary,  
Colonel J. Waterhouse, 12, Hanover-square, W.
- October 18-24 ..... Croydon Camera Club.
- „ 22-Nov. 19... Philadelphia Photographic Salon. Foreign Repre-  
sentative, A. Horsley Hinton, 1, Creed-lane, E.C.
- Nov. 27-Dec. 18 ..... American Institute Photographic Salon (New  
York). Hon. Secretary for European Exhi-  
bition, H. Snowden Ward, 6, Farringdon-  
avenue, E.C.
- December 7-9 ..... Hove Camera Club. C. Berrington Stoner,  
24, Holland-road, Hove.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Patent News.

The following applications for Patents were made between July 31 and August 5, 1899:—

- STEREOSCOPIC APPARATUS.—No. 15,605. "Improvements in Stereoscopic Apparatus." W. THOMSON and THE JACHTO PATENT AUTOMATIC ADVERTISING LAMP COMPANY, LIMITED.
- DISHES.—No. 15,713. "Improved Photographic Dish or Tray for De-veloping, Toning, Fixing, Washing, and the like." P. V. LEVI.
- COLOUR PHOTOGRAPHY.—No. 15,753. "Improvements in or relating to the Production and Exhibition of Photographic Representations in Natural Colours." Communicated by L. Dacos Du Haeron. A. J. BOULT.
- CAMERAS.—No. 15,825. "Improvements in Photographic Cameras." Com-municated by the Vive Camera Company, United States. E. E. SHEDD.
- COLOURING.—No. 15,861. "An Improved Form of Coloured Photography to be used for Ornamental or Decorative Purposes." G. J. SERSHALL and A. F. BIDDLE.
- VIEW-FINDER.—No. 15,676. "Improvements in Photographic Finders or View-meters." J. E. THORNTON and C. F. S. ROTHWELL.
- VIGNETTES.—No. 15,863. "Improvements in Vignettes for Photographic Purposes." G. J. SERSHALL and A. F. BIDDLE.
- ACTINOMETER.—No. 15,864. "An Improved Actinometer for Photographic Use." G. J. SERSHALL and A. F. BIDDLE.
- BACKGROUNDS.—No. 15,950. "Artificial Backgrounds for Photographs." T. R. WATSON.

## Correspondence.

\*.\* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\*.\* We do not undertake responsibility for the opinions expressed by our correspondents.

### OZOTYPE.

To the EDITORS.

GENTLEMEN,—The June number of the *American Amateur Photographic Magazine* contains an article on the subject of a new process of photo-graphic printing called Ozotype, a modification of carbon printing, the distinguishing feature being that a visible image is obtained by printing out upon paper which is sensitised by being brushed over with a solution containing "manganous" sulphate and bichromate of potassium (the formula of which is given), and that subsequently this print, after being washed and dried, is moistened in an acid bath, with a small addition of hydroquinone (formula given). At the same time a piece of carbon pigmented tissue is soaked in the same acid solution, and is then squeezed on to the moistened print. After setting up to dry, the print with the squeezed tissue is first subjected to a cold bath for thirty minutes, and then transferred to hot water, and it is said that the part of the pigment (as in the regular carbon process) which is not affected by light is dissolved away and the picture is obtained. I tried the process as stated, using sulphate of manganese and the bichromate solution, and proceeded to print out, obtaining a fairly good brown-coloured image. I then followed the directions given, and, after placing the print with its adhering tissue in the hot water, I could get no further, as the pigment

continued to adhere to the print, refusing to dissolve. I tried three separate times, with the same result.

My object in troubling you is to ask you if you can help me to the right solution, and, if you cannot do so yourself, could you, through the officers of the Royal Photographic Society, or through the inventors of the process in question, obtain for me the *correct formula* to enable me to make a further experiment? I only work as an amateur, but I am greatly interested in all that pertains to the subject of photography, and I was particularly struck with this new process, and should very much like to be able to attain the desired results, and, in the event of success, to demonstrate the process before our Camera Club members in this city, where I feel sure the process would be highly appreciated. I am told that the process is patented in England, and is successfully used there, and that a patent has also been taken out in this country; and in any communication on the subject I should be glad to know in what way the patent right would apply, that is, if any royalty would have to be paid, or any licence required to use the process.

Apologising for troubling you at such a length, I am yours, &c.,

COLIN NAPIER.

609, Marshall-avenue, St. Paul, Minnesota, U.S.A., July 28, 1899.

P.S.—I am from Liverpool, have been eighteen years in this country. One of my most intimate friends was the late Mr. Benjamin Sayce, whose name is recorded in your Almanac, and who was the first (or one of the first, at all events) to introduce the dry-plate process.—C. N.

[We fail to see, supposing the directions were carefully carried out, why our correspondent has not succeeded. It is possible that the carbon tissue is at fault. Does it work well when sensitised with bichromate of potash and used in the ordinary method of carbon printing? If it does not, that may account for the difficulty. If this should meet the eye of Mr. Manly, perhaps he will kindly set our correspondent right, and, at the same time, say under what condition the process can be worked by amateurs in America.—EDS.]

## VALUE OF ENGRAVINGS.

To the EDITORS.

GENTLEMEN,—I think I saw in the JOURNAL a short time ago an editorial note on the subject of old engravings and the high prices they have been realising at sales. I have a pair of very fine coloured en-gravings, by W. Ward, from paintings by G. Morland, called *The Farm-yard* and *The Farmer's Stable*, and published by "J. B. Smith, King-street, Strand, July 1, 1795." They have been in the family nearly a century, and, I believe, are very scarce. No doubt there are others in existence, but I have never seen their fellows anywhere. It would be interesting to learn whether they are commonly known or not, and perhaps the publication of this letter in your widely circulated JOURNAL may bring to light some information on the subject. The family have always been under the impression that the pictures were rare, and, to a certain extent, valuable as reproductions of G. Morland's paintings, but it is possible they have valued them too highly.—I am, yours, &c.,

Newport, August 7, 1899.

COLONEL.

[Some correspondent may be able to give an idea of the value of the engravings in question.—EDS.]

## Answers to Correspondents.

\*.\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\*.\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\*.\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

PHOTOGRAPH REGISTERED:—

J. Stuart, Claverton, Helensburgh.—Photograph of late Dr. Bruce.

AJAX, and many other correspondents.—In our next.

E. C. HEWITT.—We are much obliged to you for your letter.

F. E. BARNETT (Brooklyn, N.Y.).—We do not undertake commissions of the nature specified.

G. L. GORMAN.—We would suggest that you communicate with Mr. Avery, of the Strand, who is demonstrating the film.



**W. H. HUNT (Willesden-green).**—We will communicate with you on the subject in the course of a week. In the mean while we shall be glad to see the letters and photographs.

**DAQUERRETYPE PLATES WANTED.**—O. P. Q. We do not know where you can get Daquerreotype plates now, as they are not stocked by any of the dealers of the present day. Possibly, if you advertised for them, you might obtain some.

**C. H. CROSBY (Chicago).**—We are much obliged to you for your letter and the enclosures. A short article on the subject shall appear in the course of a week or two. We were very much amused with the "chemical" story; the author's theories are all his own.

**PRECIPITATED GOLD.**—P. CONNELL. The reason why the solution turned brown directly it was mixed, and deposited a sediment, is either that impure water was used or that the solution was made in a dirty vessel. From the appearance of the deposit we should suspect the presence of a trace of hypo.

**TEST FOR PLATINOTYPES.**—C. WILTON. You may be right, that the so-called platinotypes are bromide prints. The simple test you ask for is a solution of bichloride of mercury. If a bromide print be put in that, the image will be bleached out, whereas a platinotype will be unaffected.

**PHOTO-MICROGRAPHY.**—NOVICIATE. The quarter-inch objective you have will do quite well for the work and will probably require no correction for chemical focus. We should, however, recommend you to use a much lower power to begin with, say, an inch and a half or two inches. After some experience is gained with a low power, then essay with the higher ones.

**STAINED NEGATIVES.**—T. BLEWITT says: "I have some hand-camera negatives that have become covered with small spots through contact with the silver paper while printing. The spots, about the size of a pin's head, show white in the prints. Can you tell me any method of removing them?"—Try King's solution for the purpose. It is sold by Marion & Co.

**GREEN PRINTS.**—NEMO asks: "Can you kindly tell me how to obtain prints the colour of that enclosed? I have tried all the toning formulae for bromide prints that I can find, but cannot get the colour. I should like to get it on P.O.P. if possible."—The only way we know of producing the colour is by the process by which the print was made, namely, the carbon process. Tissue of the colour is a regular article of commerce.

**FAULTY MOUNTS.**—LANCS says: "I have a number of mounts that cause silver prints mounted upon them to fade in two or three years, and have discarded them for the purpose. Now, it has occurred to me that they could be utilised for carbon pictures. Do you think they can safely be used up in that way, as they are costly mounts?"—We should say so, as it is very unlikely that the mounts would have any ill effect on carbon prints.

**BANKRUPTCY.**—O. O. says: "My late employer has become bankrupt, owing me a month's wages. He says he cannot pay me, and I shall have to take so much in the pound with the other creditors when the affairs are settled. Would it be any use suing him in the County Court, as I am told that wages of servants must be paid in full?"—No; you must claim against the estate, but you will be paid in full. If you apply to the receiver in bankruptcy, it is possible, as your claim is for wages, it will be paid at once.

**DUST ON NEGATIVES.**—W. S. W. says: "They are pulling down a house next door to me, and I left some whole-plates on a rack at an open window to dry. Dust from the building has settled on them and dried on, and I cannot get it off. Can you help me, as I cannot take the negatives again? It is doubtful if the dust can be removed."—The only thing we can suggest is to soak the plates in cold water for a few hours, and then gently rub the surface with a pledget of cotton-wool. With care, in this way, the particles may probably be got off.

**PRICE OF ETHER.**—COLLODION writes: "I use a good deal of ether at times, and I have just seen a German price-list in which the best ether is quoted at a price much below what it is here. Can you give me an idea of what the carriage of a few gallons at a time would be to this country?"—We cannot; but it would, we suspect, be considerable, owing to railway and other carriage restrictions. Possibly you are not aware that there is a duty on ethers imported into this country. If we remember rightly, it is about 26s. a gallon on sulphuric ether.

**POST AS OPERATOR.**—A. L. says: "I hold a first-class certificate of proficiency in photography from South Kensington, and I wish to obtain an appointment as operator in a high-class London studio. Will you please inform me the best way to proceed?"—We should say the best way will be to article yourself to a first-class photographer, so as to learn something about portrait photography. Tuition in the class room, however proficient you may become there, does not avail much in practical work in the studio. There posing and lighting are the chief essentials, and still more so is tact in dealing with the sitters, things only acquired by actual practice in a studio.

**REVERSED ENLARGEMENT.**—Z. L. writes: "I sent a negative, with cash, to be enlarged. When I got the enlargement I found that the figure, as regards right and left, was reversed. I returned it, with the request for another the right way about. In reply, I got an apology for the mistake, but saying, as it was a portrait, it did not matter, but, if I liked, another would be made for half price, which I refused to pay. Now they have sent the picture back. What can I do?"—Send the enlargement back, telling the enlarger that, if another is not furnished at once, you will proceed in the County Court for the money paid. We should like the address of that enlarger.

**LACK OF BRILLIANCY IN NEGATIVES.**—G. AND B. write: "We have been for some time in trouble with our negatives; there is no brilliancy in them, and the image itself on the ground glass is not brilliant. The lens is —'s cabinet, which we have had in use for years, and it is only the last month or two we have become troubled, so it is not the fault of the lens."—We should rather say that it is the fault of the lens, or rather its mount. Reblack the inside of that, as well as the inside of the camera. If that is of the bellows form, line it with black velvet.

**LENS QUERY.**—H. BETTS writes: "I want a rapid rectilinear lens of about nine inches focus. I find, on reference to the price-lists of first-rate opticians, that the cost is more than I can afford; but I find there are similar lenses of foreign make about a third the price. Are they as good as the more costly ones if they are stopped down?"—Cheap lenses of foreign make are of a very variable quality. The great advantage of a high-class instrument is that it can be used with its full aperture, thus securing great rapidity. When a bad lens is used with a very small stop, it will generally give a fair result.

**SENSITISING ALBUMEN PAPER.**—PRINTER complains: "The albumen paper we had in last, —'s make, curls up directly it is floated on the bath, and often wets the back. Can you tell me how to avoid this, as I have not had much experience in sensitising paper?"—This is by no means an unusual experience when the paper is abnormally dry, as it frequently is at this season of the year. The trouble may be overcome by gently breathing on the back of the paper directly it is put upon the solution; in a few seconds it will lie flat. Another way is to keep the sheets in a damp place for an hour or two before sensitising them.

**LENS QUERY.**—W. BELL writes: "The new anastigmatic lenses are very costly, and so are the R.R.'s of our leading opticians; but there are cheap (French make) imitations of the latter that are really very good. Can you tell me if there are any cheap (say, French) imitations of the costly anastigmatic lenses, and where they are to be had?"—No. All the new forms of lenses of the anastigmatic type are the subject of patents, and, until they expire, there will be no imitations of them. When they do expire, however, you must not expect them at the price of R.R.'s, as they are much more difficult to make.

**OPERA-GLASS LENSES FOR PHOTOGRAPHY.**—G. KINGSFORD writes: "I have a large opera glass, and I think of getting a mount made, so that the object-glasses can be screwed into each end, with a stop between them, after the manner of a R.R. lens, so as to be used for a hand camera. The lenses are somewhere about seven-inch focus. Will you please say if the combination will be rectilinear, and cover a quarter-plate with the full opening, which will be about two inches?"—The lens will be rectilinear, but it will not cover the quarter-plate with the full opening, or, indeed, with a small stop, as the combination will only be about three and a half inches focus. Also the field will be very round.

**CRACKED PRINTS.**—B. & Co. complain as follows: "We are much troubled by our prints (albumen) cracking all over the surface. We use —'s doubly albumenised paper, and the trouble seems greater in hot weather than it is in cold. The prints look all right while in the washing water, and it is only when they are dry that the cracks become apparent. Can you suggest anything by way of a remedy?"—The cracks are caused by the prints being allowed to curl up while drying and then being flattened out. The remedy is to keep them flat while drying—drying them between blotting boards under pressure. If the prints are mounted while they are wet, the cracks will be avoided.

**EXPIRED COPYRIGHT.**—DOUBTFUL writes as follows: "Many years ago a photographer here took a photograph of an old and interesting building, which has since been pulled down, and made the picture copyright at the time. Before he died he sold his business and negatives, this one amongst them, and the purchaser continued to publish them. I have recently copied this and one or two others, and sold them, and now I am threatened with legal proceedings. What I want to know is, How long does a copyright last? The one who took the photograph, and made it copyright, has been dead this fourteen or fifteen years."—Copyright endures for the life of the author and for seven years after his death. Consequently there is no copyright in this photograph.

**TONING.**—TONING says: "Could you kindly explain the cause of the following concerning toning? The paper used is the Ilford and also Cadett (gelatino-chloride). The formula used is the Ilford toning formula, consisting of gold and ammonium sulphocyanide. There is a stock solution of each, and just before the actual toning the two are mixed and made up with the proper amount of water. The process of toning usually takes just under five minutes; I tone either one or two sheets at a time. Before the toning, the prints are in the washing water about three-quarters of an hour, an alum bath being used half way for ten minutes, the strength of which is made roughly, without weighing. I have tried with and without salt in the washing, before toning; when salt was used for five to ten minutes, the prints passed through it previous to the alum bath. What I want to know is the cause of the following:—1. For the last few days the toning seems to have gone wrong, instead of taking five minutes the prints take ten to fifteen minutes. 2. I get fearful double tones; 3. and irregular toning. If a print happens to be uncovered in toning for even a quarter of a minute or so, a line shows. 4. Once or twice there has appeared a sort of sky-blue patch, unlike the toning blue. Do I wash the prints too long, or should the toning be made up long before using, or is it the heat, or what is the matter?"—1. Probably the alum solution is too strong for so long an immersion. 2. Try a weaker solution of alum. 3 and 4. That is quite what might be expected. The prints must be kept in motion, and always covered with the solution. It is better to make up the bath ten minutes or so before it is used.



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## EX CATHEDRA.

At a recent meeting of the Photographic Society of Philadelphia, Mr. W. E. Partridge described the following interesting process of making enlargements by painting over a projected image. "Those of us," he says, "who want to make pictures, and make them of a size to go on the wall, can do so, and not have to be artists. Make your picture; then prepare to enlarge it, putting it in your enlarging frame; then take a piece of black canvas to enlarge on (no preparation is needed beyond a piece of tailors' chalk). Make your outline, correcting the drawing if necessary; then commence with zinc white, mixed up with gum water about as thick as oil paint, putting on your high lights first, and working towards black. This does not require drawing—it only needs the light and shade of the print before you. You can turn on your enlarging light at any time. If it is not right, let it dry, and brush it off with a whisk broom and begin again. It is the quickest of all processes for producing pictures, and has the advantage of quick erasing. It has also all the advantage of the old wood engraving in putting

white upon black and not black upon white, as in all of our other graphic arts. When you have finished you can, if you like, make a negative of what you have got."

\* \* \*

THE *Daily Telegraph* of Wednesday last contained the following interesting announcement:—"The Duchess of York, who is staying at Longford Hall, visited the Royal Castle Glass Works, at Hatton, and subsequently the Photo Decorative Tile Company adjoining. At the first-named place Her Royal Highness displayed great interest in the process, and ordered a number of articles to be made, and herself assisted in the process. At the Tile Works she sat for her photograph, to be reproduced in photo models [? enamels]. Her Royal Highness was accompanied by Lady Katharine Coke, the Earl and Countess of Lathom, Hon. A. N. Hood, Mrs. Crutchley, and Mr. Reginald Coke, and the entire party were photographed for reproduction in a group on the glazed tiles. The process is a comparatively new one, having been patented only about two years. From the works the party drove to the Old Castle at Tutbury, which is the property of the Duchy of Lancaster. John of Gaunt's Gateway and the dungeon where Mary Queen of Scots was a temporary prisoner were inspected, and the visitors partook of tea in the castle before returning to Longford."

\* \* \*

WE are sorry to have to announce the death, on the 19th inst., of the Rev. Canon St. Vincent Beechey, rector of Hilgay, Downham. Canon Beechey, who was in his ninety-fourth year, was probably the oldest living photographer, and he is said to have been the oldest living clergyman. He had been rector of Hilgay twenty-seven years, and instituted the electric lighting of the church, schools, and rectory. He was best known as having, while vicar of Fleetwood, founded Rossall School, and as being the son of Sir William Beechey, the eminent portrait painter and an intimate friend of Lord Nelson. A third of a century ago Beechey's collodion and the Beechey collodion dry plates were well known to photographers. The deceased gentleman was an accomplished photographer, and often contributed to these pages articles on the subject of his favourite pursuit.



SPECIAL interest attaches to the illustrated catalogue of astronomical instruments, observatories, &c., manufactured by Sir Howard Grubb, of Rathmines, Dublin, a copy of which that gentleman has been kind enough to send for our acceptance. It is illustrated by some half-tone reproductions of astro-photographs and several views in the optical works. A large variety of telescopes are described, and some of the famous instruments Sir Howard has made and erected are pictured. There are some exquisite collotype photographs of the late solar eclipse, the great nebula in Orion, &c., and altogether the catalogue, which is beautifully produced, is one that appeals strongly to those interested in astro-photography.

\* \* \*

MR. CHARLES SWEET, the well-known and able photographer of Rotherhay, N.B., sends us an illustrated pamphlet intended for circulation amongst his clients. It gives a view in half-tone of his new studio and many excellent reproductions of his admirable child studies, marine subjects, &c. Mr. Sweet's list of patrons is a large and aristocratic one. This is not to be wondered at, for his work is exceedingly good, and his enterprise in taking advantage of the half-tone process for drawing renewed attention to that work will, no doubt, add to the list.

\* \* \*

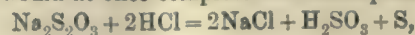
THE editor of our lively contemporary, *Ally Sloper's Half-Holiday*, informs us that we have been elected a member of Sloper's Club, which entitles us henceforth to affix to our name the letters M.O.S.C. A certificate of membership and a medal have also been sent to us. We assure our contemporary that we highly value the compliment that has been paid us, and will endeavour to act in all things not unworthily of the august position of a M.O.S.C.

## TONING METHODS II.

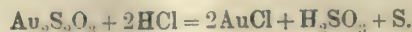
CONTINUING our remarks upon the adaptability of the various salts of gold for toning modern papers, we will first remind our readers that we have shown that gold chloride unites chemically with gelatine, forming an insoluble compound, and thus causing a waste of gold and tending also to unevenness in toning. Also we pointed out that the sulphocyanide and thiosulphate of gold have not this reaction, and therefore are in general use at the present day, more especially the former.

It is a very curious fact that the thiosulphate, or, to speak of it in its more familiar name, the hyposulphite of gold, or sel-d'or, has almost entirely disappeared from the photographer's laboratory. Yet, in the very early days of photography, it was almost universally employed, first for toning Daguerreotypes, and afterwards for ordinary paper prints. If, however, we refer back to some of the oldest toning formulæ in which the sel-d'or was employed, we are enabled to gain a glimpse of the reason for this disuse. Taking one as an instance, we find the ingredients to be 1 grain of gold, 4 grains of hypo, 4 drops of hydrochloric acid, and 10 ounces of water. It is evident on the face of it that with such a bath the resulting tones would be due to sulphur principally. We have already pointed out that hypo is an exceedingly unstable compound. In the above formula we have both gold hyposulphite and soda hyposulphite, and the addition of the hydro-

chloric acid would at once complete the decomposition thus:—



and again—



Here we see that the result of this mixture is, in the first instance, the formation of sodium chloride and sulphurous acid and the liberation of free sulphur, and in the second case the same reaction, excepting that aurous chloride is formed. The free sulphur would inevitably combine with the printed image, and more or less with the unreduced silver salts in the rest of the paper, giving rise to sulphur toning and a general yellowness over the whole picture. In those days very little was known of the real nature of the changes taking place in toning operations, and there is little wonder that, when alkaline toning was introduced, sel-d'or was soon almost forgotten.

The introduction of the modern gelatine-coated paper, however, was responsible for the reintroduction of sulphur combinations in toning in the shape of sulphocyanide of ammonium and gold. Although gold hyposulphite has been spoken of, yet it has not recovered the position it once held in the estimation of photographers. Sulphocyanide answers admirably, giving with ease a great range of tones. The principal fault found with it is the tendency in certain cases to give what are termed double tones or uneven toning. The causes of this we have already treated upon. With sel-d'or, however, there is very little to complain of in this respect, toning being even and perfectly under control, and when properly used the whites are perfect, whilst almost any shade to deep black can be obtained in the shadows. We would, in conclusion, recapitulate a few of the points necessary to be attended to for success, premising that the same applies to both sel-d'or and sulphocyanide methods.

First, all organic salts of silver or free nitrate of silver should be removed from the prints before toning by washing in water, then salt and water, and afterwards again in water. If this is not thoroughly done, there is a danger of insoluble yellow compounds of sulphur and silver being formed, which are not thoroughly removed by the hypo. Secondly, in making up the sel-d'or or gold hyposulphite, the solution of gold chloride or hypo should never be allowed to have a trace of acidity present, either before or after mixing. The gold should be slightly alkaline before mixing. Thirdly, the sel-d'or should not contain a large excess of hypo in its composition. The true sel-d'or, made by mixing equivalent proportions of hypo and gold in concentrated solution and then precipitating by alcohol, may be used, but is troublesome to make and by no means necessary. The double salt of thiosulphite of soda and gold is equally as effective provided the excess of hypo is kept within certain limits. The whole operation is perfectly simple, and we would recommend those of our readers who find toning troubles cropping up in their work to give sel-d'or a trial. The following will be found to give good results, but, as will be readily seen, is capable of considerable variation.

In a clean glass measure put 2 ounces of chloride of gold solution, containing 2 grains of gold chloride. In this put a strip of litmus paper, which will at once turn red from the acid present in the gold chloride. Now add a solution of carbonate of soda drop by drop with constant stirring until the litmus paper turns blue and remains so. In another measure dissolve eight grains of hypo in two ounces of water. As soon as solution is complete mix the two solutions by



pouring the gold into the hypo with constant stirring. Now make up to 10 ounces with water, add 20 grains of sodium chloride, and the bath is complete. The sodium chloride is not a necessity, but will be found to assist in keeping pure whites. When toned, wash and fix as usual.

We have thus far confined our remarks principally to toning methods in every-day use, but the subject is by no means exhausted. We must leave it to those of our readers who are experimentally inclined to go further into the subject. It is more than probable that the series of salts known as aurates would be found of great value. Auric oxide,  $\text{Au}_2\text{O}_3$ , combines with the oxides of most alkalies and alkaline earths to form a series of soluble salts, of which the sodium aurate might be taken as a type,  $\text{NaAuO}_2 \cdot 2\text{H}_2\text{O}$ . Salts of this series do not precipitate gelatine, and, if care be taken not to have an excess of the hydrate present, are stable and permanent both in the crystallised state and in solution.

### PRACTICAL PROBLEMS.

Few photographers, amateur or professional, practise their craft for any lengthened period without encountering difficulties which, for the time, seem inexplicable. Those who can do so wisely consult some friend who can look in at their work-room and critically go into the matter with them. Others, cut off from such assistance, must perforce seek the aid of text-books or of editors of journals or of manufacturers of materials.

We wish to point out that the photographer who approaches these problems in a scientific spirit is the most likely to arrive at a correct solution and a speedy delivery out of all his troubles. We are aware that, at the sound of the adjective "scientific," many of our readers will conjure up chemical formulæ, logarithms or researches such as those of Hurter & Driffield, and will protest that in their slight acquaintance, if any, with these things they find no practical aid. But science is after all very much like common sense, and many people who have not received any scientific training have, nevertheless, the faculty of approaching a problem in a really scientific manner. There is something not understood or misunderstood; something which happens which ought not to happen, the reason for which does not appear. The scientific spirit leads the photographer to so adjust his method of work as to frame an intelligent question in regard to the difficulty, to which nature may make an intelligible answer. For example, where spots appear on prints during toning and fixing, one would naturally modify the conditions of the routine—say, the water or the hypo—so as to trace the difficulty to its source.

Much assistance is, of course, desirable from a theoretical knowledge of the causes likely to lead to certain ill effects, and we do not for one moment wish to be understood to depreciate such assistance; but, at the same time, many difficulties would cease to be such if photographers possessing no great technical knowledge would seek to approach them in a spirit of investigation, assuming an agnostic attitude until reason appears for the assignation of the trouble to some particular quarter.

It is often difficult, and in many cases impossible, for any one unacquainted with the photographer's methods of working a process to pronounce a definite opinion in regard, let us say, to stained or faded prints merely by the inspection of several specimens. Indeed, the difficulty is often intensified by the

meagreness of the details—such as paper, toning bath, &c.—furnished by the applicant.

Very frequently no one is in a better position to help the photographer out of a difficulty than is he himself; we are speaking principally of spots and stains on prints, things which will make their appearance in the best-regulated establishment. We would, first of all, suggest that every practitioner should keep a watchful eye on the literature of subject in the photographic press, remembering that what are to-day the difficulties of others may be his own to-morrow. Practised workers are constantly recording the way in which apparently inexplicable troubles were traced to causes which, for a time, eluded detection by their very propinquity. Black spots, for instance, from grit in the wash water or particles of metal abraded from the bearings of a squeegee; spots on negatives simply caused by the use of a pyro-soda developer several times, whereby it is liable to deposit insoluble matter (or the same thing may happen by mixing fresh developer in a measure from which the old has not been rinsed). Then we need not call attention to the researches which various chemists have conducted at the request of manufacturers of certain papers, systematic filing of cases of this kind will soon place the photographer in possession of the cause and cure of almost all the ills that prints and plates are heir to. His own observation and judgment must be called into use to help him form a correct diagnosis of the malady from which his own products are suffering; but this is a far easier task when a description of the symptoms of previously diagnosed cases is at hand for comparison.

**Photographing Crystals.**—A correspondent calls our attention to the fact that the information sought by a correspondent a week ago with regard to the photographing of crystals might, in one phase, be found in a paper by Mr. W. J. Pope, read at a recent meeting of the Chemical Society. The apparatus used were an incandescent gas lamp, a lantern condenser, a polarising microscope (with the tube placed horizontally), and a camera arranged so as to be concentric with the microscope. The microscope can be used with or without an eye-piece, but by using it Mr. Pope states that a flare-spot disappears that shows without an eye-piece. We may here state that the "flare-spot" is simply a reflection from the microscope tube, and can be obviated by lining the latter with velvet. "The crystal preparation is placed on the microscope stage, and, by simultaneously racking the camera-back and the objective backwards and forwards, an image of the required size is focussed on the screen; the slide is then adjusted on the stage till the part to be photographed occupies the field of view. After finally focussing by means of the fine adjustment of the microscope, the picture may be photographed. Using a one-inch objective of N.A. = 0.25, and a total magnifying power of sixty diameters, the necessary exposure with such an apparatus as that described is from three to five minutes. When low powers, such as a one-inch or half-inch objective, are used, all the sub-stage condensing systems are removed. . . . The objects are photographed between crossed Nicols . . . mainly because the outlines of doubly refracting preparations, though nearly invisible in ordinary light, become plainly visible and stand out with great boldness when examined or photographed between crossed Nicols."

**Photographs of Lightning Flashes.**—At the present time, when thunderstorms are not uncommon and many facilities present themselves for securing pictures of lightning flashes, a few words on the subject may be useful. Our attention was drawn to the subject by the fact of a lady asking us to develop half-a-dozen negatives she had been taking of lightning flashes. We



developed the plates, or, rather, we passed them through the developing solution, and there was not a trace of a flash on any one of the plates. A few inquiries elicited the fact that our fair friend had used a "snapshot camera," and each time she saw a flash pointed the camera at it and snapped the shutter. A vivid flash leaves such a lasting impression upon the retina that such an error was excusable, but, as many of our readers will know, it would be next to impossible to obtain flash pictures in that manner. The plan to adopt simply consists in fixing the camera on a tripod and, first focussing for distance, and direct the camera (supplied with a wide-angle lens) to the part of the heavens where flashes have already appeared. Draw the shutter, take off the cap, and wait till a flash appears, and then expose another plate in a similar manner, and so on. The chance has to be taken as to whether the flash will appear in the middle of the plate or near its edge. The use of a wide-angle lens minimises the chance of losing the flash altogether. It should be stopped down to *f*-32.

**Photography and the Dreyfus Case.**—We have on a former occasion referred to the way that that unfortunate man, Captain Dreyfus, and his anxious wife, are persecuted by the ubiquitous photographer and cinematographer. The special correspondent of the *Standard*, writing one day last week, says that the proprietor of a vacant piece of land at the corner of the Military Prison at Rennes had erected a stand, from which, for a small sum, journalists and photographers could obtain an excellent view or snap-shot of the prisoner as he passed to the Court. However, this enterprising individual was afterwards notified by the authorities that he must keep his land clear during the time that Dreyfus was passing to and from the Court. Every one will commend the authorities for taking this step. Probably in this famous case photography has been utilised quite as much as it was in the celebrated Tichborne case, though perhaps less creditably. We all remember that, when this unfortunate man was degraded by having his uniform mutilated, he was photographed, and the photograph publicly shown.

**Faupers' Photographs.**—At the last meeting of the managers of the Central London District Schools, according to the *City Press*, a letter was read from Mr. H. Lockwood, one of Her Majesty's Inspectors of Schools, asking for photographs of boys and girls at the school, in addition to some that had already been given to him. He wanted them, he said, to show in the Poor Law Schools section of the British department at the forthcoming Paris Exhibition. The request, the report says, was referred to the House Committee. The application will doubtless receive due consideration from this Committee before it is granted. The children are paupers now, but they may not be in after life, and many of them will not care to let it be known that they received their education as paupers, and to know that their portraits as such had been shown in an international Exhibition. When, some time ago, a somewhat similar application was made to the Hampstead Guardians, by a photographer, to take portraits of the inmates of the workhouse, it was indignantly refused, and very rightly too.

**The Wellman Polar Expedition.**—A Reuter's telegram from Tromsø, dated August 17, says that the steamship *Capella* arrived there that evening with Mr. Walter Wellman and the survivors of his expedition. Mr. Wellman, it seems, had several unpleasant experiences—severe storms, an earthquake by which many dogs were crushed and sledges destroyed, and the men narrowly escaped with their lives. Mr. Wellman also met with an accident and seriously injured his leg, and the party was therefore compelled to retreat, dragging him on a sledge, making forced marches of nearly 200 miles to the headquarters of the Expedition. The continuous temperature during ten successive days was of 40° to 50° below zero. It is stated that several new lands and many islands have been discovered in Franz Josef Land, and much important scientific work was done by Dr. Hofman, Lieutenant Baldwin, and

Mr. Hanlan. No traces of Andrée, his companions, or the balloon were, however, found in Franz Josef Land. Photography was a feature in this Expedition, and it would be interesting to learn if any plates or films were exposed when the temperature was between 40° and 50° below zero, and what was the result, when they were (or are) developed.

**Camera for Stellar Photography.**—Our contemporary, the *English Mechanic*, has an illustration and description of a simple method of using an ordinary camera in connexion with a reflecting telescope. The camera employed—by no means a costly one—is fitted with a separate baseboard with a long slot in the middle. An iron strip, suitably bent, has one end firmly clamped to the telescope mount by means of a clamp, and the other end bent so as to be parallel with the baseboard. This end of the strip, which is slotted; is screwed on to the baseboard. When the focus is altered, the camera shifts up and down, and is clamped into position by means of its tripod screw. The camera is half-plate, and is supplied with a wide-angle lens.

**Aceto-cellulose.**—In a German chemical journal, Dr. C. A. Weber speaks very highly of Messrs. Cross & Bevan's acetate of cellulose, and prophesies an important industrial future for it. The nitro-celluloses or gun-cottons, including the well-known pyroxylin—the basis of collodion and of celluloid—resemble this new product in many respects, one important difference in favour of the aceto-cellulose being the non-explosiveness and the ability to stand a high temperature without decomposition that characterise the latter. Further, it is not soluble in alcohol, acetone, or ether, but dissolves in chloroform, nitro-benzol, and certain other bodies. Its great insulating properties render it useful for replacing mica for electrical purposes, while in many other cases Dr. Weber suggests its use in lieu of celluloid. It remains to be seen whether it could not be effectually utilised for many purposes of photographic technique.

**Coins as Units of Weight.**—A scientific paper recently had a paragraph on this subject, to the effect that "it is stated that the five-cent nickel coin of the U.S. currency was designed with special reference to its use as a unit of weight or measurement by the decimal system. It is exactly five grammes in weight and two centimetres in diameter. This, of course, is not an accident, and if there be any change in America's system of coinage, other convenient measurements and weights will be adopted according to the same system."

BUT America is not the only country where a coin has been made with a definite and convenient weight and measure. The fact is not sufficiently appreciated that in our own bronze coinage we have an excellent unit of weight and measure in the halfpenny piece. This coin weighs, when new, exactly one-fifth of an ounce, and its diameter is exactly one inch; the penny is of less convenient weight—one-third of an ounce. Hence five halfpennies or three pennies can be utilised instead of the usual brass weights for any non-commercial weighing operation. There is a real convenience in this system, for while it is not an infrequent thing for a weight to be missing just when it is most wanted, five halfpennies are always obtainable. It may be thought that in so common a coin the weights may be variable, but the contrary is the case. No halfpenny piece is issued which is more than .2 per cent. wrong in weight, one-fifth of one per cent. being what is known as the legal "remedy" in weight, and as this does not amount to one grain in an ounce, we may safely assert that the average unstamped ounce weight that one would purchase at the ironmonger's would not probably be more exact than this.

**A National Physical Laboratory.**—The report of the Committee appointed by the Treasury to consider the desirability of establishing a National Physical Laboratory was issued last week. It is favourable to the establishment of such an institution, and



recommends that it should be an extension of the Kew Observatory in the Old Deer Park, Richmond. The first object, as set forth in the report, of such an institution is to be the standardising and verifying of instruments for testing materials, and for the determination of physical constants. It is proposed in the report that the laboratory shall be under the auspices of the Royal Society, and that it shall nominate a governing body, on which commercial interests shall be represented, and that the choice of members of such body is not to be confined to Fellows of the Society. This, we think, is a very desirable recommendation. It is also recommended that the permanent Secretary of the Board of Trade should be an *ex-officio* member of the governing body, and that such body should be consulted by the standards office and the electrical standardising department of the Board of Trade upon all difficult questions that may arise from time to time, or as to proposed modifications or developments. When this proposed institution gets in working order, we may perhaps get some standard system of testing the speed of dry plates, a thing now much wanted amongst practical photographers. [See p. 540.]

**Royal Academy Winter Exhibition.**—It is announced that the next Winter Exhibition of the Royal Academy is to consist exclusively of works by Vandyk. This should be a highly interesting show to photographers, particularly to portraitists and those who make a feature of figure studies. This great master's works are almost entirely confined to portraits and figure studies, and at this Exhibition the public will have the opportunity of seeing such a collection that it may never have again. Our public galleries are by no means overstocked with Vandyks, and more is the pity. As we have said before, the Queen, in her private collections, has some of the finest examples of this famous artist's work in this country, and probably a larger number of them than is to be found in any other. By the way, the Vandyk Tercentenary Exhibition at Antwerp, to which we have referred before, is now open, and tourists who are taking their holidays in Belgium should not miss the opportunity of paying it a visit.

**The Spy Scare Again.**—This time Austria! The *Standard's* correspondent, writing from Vienna, says the Styrian papers report that a French captain, who was caught taking photographs of objects of military importance in Carniola, has been arrested and taken to Vienna. Possibly the authorities may, or may not, have some ground for this arrest, as the French captain may have been suspected of having ulterior objects in view. Be that as it may, the arrest of a suspected spy in any country is always sure to lead, for a time, to extra vigilance on the part of the minor authorities, and English tourists abroad (and there are hundreds at this season) should bear this fact in mind, and be careful where they are seen with a camera. We say seen with a camera, for we read that recently an amateur who was merely standing with a camera, watching some soldiers at drill at Dantzig, was arrested. He had made no attempt to take a photograph, yet he was, so it is said, kept in confinement for several days while his plates were being developed, and as they showed nothing at all compromising he was then liberated. A few days in "durance vile" materially curtails a holiday, so English tourists, beware!

#### JOTTINGS.

**VARDON!** Vardon! Vardon!—the name of the Englishman who is champion at Scotland's own game—this is the sound above all others that has been heard in East Lothian during the last few weeks. For golfers, and they form a remarkably large percentage of the population north of the Tweed, there is hardly such a thing as a Dreyfus case, and the drama at Rennes is dismissed from discussion before the second cup of tea is reached at breakfast. But Vardon and his doings at Nairn, Barnton, North Berwick, and elsewhere, are not off the tongues of the enthusiastic Scotch admirers

of the mighty Englishman for more than a few minutes. At New Luffness the champion drew a crowd of 4,000 people to see him play the local professional, and the camera in the hands of that very able worker, Mr. W. J. Croall, has perpetuated some of the notable doings on the Links, for the benefit of the millions at a distance who are interested in the champion's progress.

But the omnipresence of golf in Scotland is equalled, if not excelled, by that of photography, which has followed me with the tenacity of my own shadow during the last fortnight. One afternoon I am taken through the romantic glen of Dunglass, a beautifully wooded gorge near Cockburn's Path, and thence to an adjacent farm, which I discover to be in the occupation of Mr. Wyllie, an ardent stereoscopic worker, who makes excellent transparencies. In my wanderings I hear a great deal about stereography. There is an inclination amongst many photographers to take up this branch of work. A stereoscopic kodak would do much to hasten the "revival" of the stereoscope.

But the greatest enthusiasm for photography that I met in Scotland was shown by Miss Crooke, the accomplished daughter of the President of the Convention, whose guest I had the pleasure of being. One afternoon a picnic at Pease Bridge was held, and Miss Crooke whose photographic abilities are so great that if her inclinations tend that way her success in portraiture is assured, took two or three groups of the party. A late arrival home necessitated the postponement of development for some hours, and it was near midnight before the negatives were shown to me; but at half-past seven the next morning, toned, fixed, and washed prints from those negatives were placed in my hands by Miss Crooke herself, who had produced two capital pictures of the happy party of pretty ladies and brave cavaliers. Whether Miss Crooke will take up photography professionally or not I do not know, but in any case her inherited skill and her own marked ability should secure for her a high place amongst the select band of lady photographers.

To return to golf, into some of the mysteries of which it was my privilege to be initiated on the links at Dunbar and those at Barnton (Edinburgh). There is perhaps no pastime but golf the acquisition of the rudiments of which is so greatly facilitated by studying photographs of the game as it is played. Attitudes and positions are everything at golf, and their very immobility makes them susceptible of being most graphically portrayed by means of photography. The niceties of position in driving, approaching, putting, &c., can be perfectly shown by means of photography, and thus mature beginners who, like myself, are put through their paces for a day or two on the links may, at their leisure, by the assistance of photographs, practise those positions and attitudes, and thus get themselves into something like apparent familiarity with the game before venturing to risk the critical scrutinies of old frequenters of the links.

I have a note to herein thank Mr. Spence, photographer, of Dunbar, for a readily granted permission to use his dark room for changing purposes. But Mr. Spence deserves even wider recognition than this, for he allows any amateur to change his plates there without making a charge. At what point the return for this kindness makes its appearance I do not know, but I hope Mr. Spence's experience is that his readiness to loan his dark room brings him in some reward in the shape of increased business. He deserves it.

Berwickshire I was told is the garden of Scotland, and certainly the great farms in the northern part of the county seemed to be in a flourishing condition. If the success or failure of agriculture be the correct key to the state of a nation's business, it may be supposed that photography is partaking of the success which appears to be waiting on all kinds of industry in the district of which Edinburgh is the centre. Wherever I went, recently taken photographs were plentifully displayed; the Edinburgh dealers looked



busy, and the hand camera, if not so frequently seen as the golf clubs, was visible in the grasp of many a tourist. I saw some of the work intended for the autumn photographic exhibition in London, and I should not be surprised if at least one R.P.S. medal did not go to Edinburgh, which holds many staunch supporters of the Society.

An afternoon is devoted to Leith Docks, under the guidance of Mr. Thomas Aitken, the manager of the London and Edinburgh Shipping Company. The fine vessels of the Company have been well illustrated photographically by Mr. Aitken himself, who knows how to use the camera to the best advantage. One of our party was a gentleman who had only recently taken to photography. He complained that he frequently cycled twenty miles along a country road without seeing anything worth photographing. Relinquishing the camera that had been kindly lent me for some contemplated dock work, I offered to point out to our "new chum" a few of the opportunities which the life of the docks offered for making pictures by photography. The offer was accepted, and in something like two hours a couple of dozen exposures had been made on subjects full of pictorial promise. It had never occurred to our friend that dock life offered any scope for camera work, and his delight at discovering the wealth of material to be obtained was only equalled by the pleasure it gave me at acting the part of photographic instructor to a newly created enthusiast. Nothing is more agreeable than the office of photographic cicerone when you have students willing to learn.

After Edinburgh, which was seen at its best and clearest during the forty-eight hours of my stay there, the light being perfect both by day and night, the scene changes to Canty Bay, opposite the great Bass Rock. Here, in perfect seclusion by the rocks of many hues that were so often painted by the late Sam Bough, R.S.A., the hospitable friend of my host occupies the one habitable abode in the lonely bay. There are launch parties to the Rock in the course of the afternoon, and, as the machinery of the little cockle-shell goes slightly wrong in mid-channel, there is a spice of excitement in the proceedings. The ladies are naturally alarmed, but eventually the whole party reaches the mainland in safety. Then it becomes my turn to take a group in commemoration of the adventurous visit to the Bass. The servants are included, and among them is one whose face is a sea of delighted smiles while I am grouping and exposing. It transpires that this is the first time in her life that she has been photographed! If, prior to this, anybody had told me that there existed a member of the opposite sex who, living near a large town, had possessed the opportunity of being photographed, and had never availed herself of it, I should have found it hard to believe them. However, there was the smiling Scotch cook to prove that such strange things could be.

And this reminds me of the story told me about the Scottish minister who, being convinced that a patronage of photography was inconsistent with an observance of that commandment relating to the making of graven images, sternly refused all requests that he should sit for his portrait, on the ground that he would be breaking the Divine law referred to. But his friends were determined to obtain a photograph of him, and one day two or three engaged him in conversation while a fourth made a hand-camera exposure on him. The minister was highly indignant when the result was shown to him, but it is not recorded whether his unconsciousness of what was being done to him allayed his qualms of conscience. It is to be hoped so.

Craigcrook, the home of my host, Mr. Crooke, at Dunbar, not only possesses one of the noblest natural positions, looking out from the rocks to the sea, but internally it is a little Palace of Delight. At every turn the fine taste of the Convention President is seen, and the sincere love which he has for photography has led him to make considerable use of it for decorative purposes. Just as Mr. Crooke's studio in Prince's-street, Edinburgh, is admired for its refined unconventionality, looking at it simply as a photographer's studio, so even

in his country home you are bound to carry your admiration on to a warm recognition of the faultlessness of his surroundings.

It may be imagined, therefore, that my stay in the North, and particularly in this photographic palace, was a happy and busy one. To Mr. Croall and my Edinburgh friends my thanks are due for a pleasant taste of Edinburgh life. In making my acknowledgments to Mr., Mrs., and Miss Crooke, and the delightful lady whom I will call Fair Helen of Dunbar (another clever lady photographer), words can scarcely represent the extent of my grateful recognition. To one and all I send my best thanks. So away at midnight from the little Haddingtonshire town where I have passed so many pleasant hours; to awake seven hours later and wonder if it has all been a dream!

My holiday, which was to have been quite non-photographic, ended as it began, viz., photographically. From the grim rocks of Dunbar, and the soothing music of its troubled sea, I go to the placid land of the Broads, there once more to talk on the eternal subject of photography with that large-hearted master of it, Dr. P. H. Emerson. Half-an-hour is passed in glancing through the first copy of the new edition of his book, *Naturalistic Photography*, shortly to be published by Messrs. Dawbarn & Ward; the photographic outlook is discussed; and there, in sight of Oulton Broad, which is dotted with pleasure boats whose white sails almost glisten in the sunshine, my pleasant photographic tour is fittingly brought to a conclusion. COSMOS.

#### FOREIGN NEWS AND NOTES.

**The Preparation of Emulsions with aid of Electricity.**—On page 181 of THE BRITISH JOURNAL OF PHOTOGRAPHY this year we gave the particulars of H. Vollenbruch's application of electricity in the preparation of rapid emulsions. Professor Valenta has experimented upon the lines described by Herr Vollenbruch and communicates the result to the *Photographische Correspondenz*. A cylindrical vessel, thickly plated with silver, was fitted with a wooden cover, and through this was inserted a thickly silver-plated, branching copper wire. The vessel was light-tight and the wire was kept from contact with the sides of the vessel. The wire was connected with the positive and the wall of the cylinder with the negative pole of a Meidinger cell. According to Vollenbruch's directions a quantity of gelatine, soaked in silver nitrate, was broken up and placed in the vessel with the requisite quantity of bromide, to which two per cent. of ammonium chloride had been added. The wire was inserted, the vessel closed, and the electric current passed through the emulsion. Trial plates were coated from time to time, washed, dried, and exposed. According to the sensitometer, the plates were very slow, and, after twelve hours' exposure to the current, reduced silver was found in the apparatus. An unripe bromide emulsion similarly treated also gave negative results, and after the experiments were completed the surface of the wire and the interior of the vessel were found to be covered with a rough coating of silver. The experiments did not show any beneficial effect in ripening the emulsion, but possibly under different conditions Vollenbruch's process may be successful.

**A New Asphalt Process.**—The same periodical also draws attention to a new process, published by F. Alberini in the *Bulletino della Soc. Fot. Italiana*. Alberini has noticed that prolonged exposure to light renders asphalt to a certain extent soluble in alcohol or even water. If a plan or line drawing is placed upon a sheet of zinc or other support coated with a solution of Syrian asphalt in benzine (0.70), 70 grammes to 1000 c.c., and exposed for five or six hours to the sun, a positive may be developed. Two or three hours' exposure will suffice if the original is a transparency. For the exposure the printing frame should be placed so that the sun's rays fall upon it obliquely, otherwise the centre of the plate will not develop properly. Alberini thinks this peculiarity may be due to over-heating of the asphalt by exposure to perpendicular sunlight. After exposure, the plate should be developed by diffused light. Immerse it in alcohol (40°) for a few minutes, let it drain, and then remove the exposed asphalt mechanically, by pouring on alcohol and rubbing with a pledget of cotton-wool. When fully developed, wash the plate under the tap, and etch for about a minute with a two per cent. bath of dilute nitric acid. Repeat the etching two or three times and sponge the plate between each bath. The plate may then



be treated and printed as an ordinary line etching on zinc. Alberini prepares it by brushing it with a solution composed of—

Decoction of gall nuts .....	100 c. c.
Nitric acid .....	4 "
Hydrochloric acid .....	2 "

The decoction of gall nuts is prepared by boiling 125 grammes of powdered gall nuts in five litres of water until the quantity of fluid is reduced to two-thirds. After brushing over the plate with the acid gall-nut solution, wash it and rub in a twenty-five per cent. solution of gum. The plate should then be allowed to dry. Before printing, wash away the gum with water and remove the asphalt with turpentine or benzine. Roll up with a fatty ink.

**Hydroquinone and Iodine.**—The *Photographische Chronik* mentions that the introduction of adurol should again draw attention to the use of iodine in conjunction with hydroquinone for development. It is said to render the developer much more rapid, and give at the same time remarkable vigour to the negative. The following formula is recommended:—

Water .....	100 c. c.
Sulphite of soda .....	4 grammes.
Hydroquinone .....	1 gramme.
Saturated solution of soda .....	10 c. c.
Solution of potassium bromide .....	3 drops.

Add to the above 3 drops of the following solution:—

Water .....	15 c. c.
Iodide of potassium .....	5 grammes.
Iodine .....	1½ "

To the latter 250 c. c. water should be added so soon as the iodine is dissolved.

**The Reducing Power of Developers.**—In the *Photographische Mittheilungen*, Dr. Lüppe Cramer takes exception to the method by which Dr. Andresen has measured the relative reducing power of certain developers. This consists in preparing silver bromide by pouring an aqueous solution of potassium bromide into a solution of silver nitrate. After the silver bromide thus formed has been washed, a certain amount of the developer, mixed with alkali and sulphite, is poured into it, and the quantity of silver reduced is determined. The relative weights are taken as representing the relative reducing power of the developers in question? Dr. Cramer inquires of what value is this in relation to the latent image. He remarks that the flocculent or powdery form of silver bromide differs so much from the granular emulsified form that what may be true concerning the former is untrue concerning the latter. As it was also found that the same results followed whether the experiments were made by artificial light or in the dark room, they cannot be accepted as conclusive for a photographic plate which requires exposure as a preliminary to development. Dr. Cramer also holds it to be a mistake to regard the amount of silver reduced as the measure of the power of the developer. By such a rule a highly restrained hydroquinone developer should be taken as more powerful than a metol developer without restrainer, as the quantity of silver reduced by the former would certainly be in excess. Dr. Cramer considers that the most rapid developer is that which gives the best image with the shortest exposure, or, in other words, the best range of gradation for production of the print. The capacity to do this he would take as a definition of the expression "reducing power."

**Warm Tones on Lantern Slides.**—According to the *Bulletin* of the Association Belge, Lumière's pyro-acetone developer should be very suitable for this purpose. Sixty grammes of anhydrous sulphite of soda are dissolved in hot water and allowed to cool. Add 12 grammes of pyrogalllic acid and make up the total quantity with cold water to 600 c. c. This suffices for the development of twelve lantern plates. For use take 50 c. c. of pyro solution, 10 c. c. of acetone, and 50 c. c. of water. The image will be of a warm black colour. With more acetone up to 30 c. c. the colour may be modified through various shades to a fine warm brown; 40 c. c. of acetone will yield a sepia, and 50 c. c. a very bright, almost red sepia. The solution discolours quickly, but does not stain the film.

When using a large quantity of acetone (50 c. c.), crystals will sometimes form and adhere to the film. This should be avoided, as it affects the image.

**A Kinematograph Competition.**—The Società dei Bagni di Mare, Monaco, invites the users of the kinematograph to send in pictures for competition, and offers the following prizes: one of 10,000 liras, two of 5000 liras, two of 2000 liras, 6 of 1000 liras, also a certain number of honourable mentions. Each competitor to whom a prize is awarded will also receive a medal and certificate. The competition is exclusively confined to amateurs, but without restriction to nationality. The films must be 35 mm. broad, and perforated with the American standard gauge. Each competitor must send in not less than three pictures, and each of them must not have been previously exhibited. The negatives and one print from each in black or colours must be packed in a box inscribed with a motto. The motto with name of sender must be forwarded by post in a separate envelope. All pictures must be sent in between December 15 and January 15 next. The jury will consist of artists and amateurs, and special attention will be given to the originality, the artistic merit, and photographic quality of the pictures. The company reserves to itself the right to exhibit the pictures during the year 1900, either at Monaco or at the Paris Exhibition, and will return rejected pictures carriage-paid within two months of the decision of the jury. All pictures must be sent carriage-paid, and it is desirable that they should be packed in tin cases.

**A Kinematograph for the Blind.**—The *Photographische Chronik* mentions that Dussand has made an adaptation of this instrument, by means of which the blind, through the sense of touch, may be given an idea of objects in motion. It has thus been possible, through a rapid succession of raised impressions, to represent birds in flight.

#### THE SILVER IN THE PHOTOGRAPH.

We have been favoured by Dr. R. E. Liesegang, of Dusseldorf, with the following chapter from a new work which he is about to publish on the Physics of Photography; and, as it has some bearing upon the discussion which has recently taken place concerning the formation of the photographic image, we thank Dr. Liesegang for thus opportunely enabling us to place a translation of the same before our readers:—

Lying before us, side by side, are a finished negative from a gelatino-bromide plate and a gelatino-chloride print, which has been fixed but not toned.

The difference in the colour is remarkable. One is an intense black, and the other a reddish-yellow.

Yet chemical analysis shows that both are formed of metallic silver, and it follows that the difference in colour is not due to difference in their chemical composition.

If both are examined under the microscope, it will be seen that the dry-plate image consists of black particles of silver lying adjacent to each other; but, upon examining the chloride picture, or preferably a transparency made upon glass with the same emulsion, we are unable to discover any particles in the silver image.

The thought at once occurs that the difference in colour depends upon the difference in size of the silver particles.

This view is supported by a number of facts.

If we compare the chloride and the bromide plates before exposure, the former is very transparent and of a slight milky appearance, but the latter is merely translucent, and not unlike a sheet of paper. The subsequent modification of the metallic silver evidently depends upon the coarseness of the salt of silver from which it has been reduced. It is possible to prepare films of gelatino-bromide which are also fairly transparent by not allowing the emulsion to ripen. Films of this description exhibit a much finer grain when examined under the microscope, and yield red images when developed.

A similar interdependence of colour and size of grain may be traced when printing-out papers are developed. If a slightly printed gelatine print is developed with gallic acid, the depth of colour may be increased to any desired extent. If the exposure is short, the image will be greenish-black in colour after fixing, but with full exposure the tone ranges between red to brown. Closer study of the process shows



that the influence of the time of exposure upon the colour is only secondary. Briefly exposed prints require more development than those which have been fully exposed. The duration of development determines the subsequent tone. The intensification of the image is brought about by the action of the gallic acid in reducing the nitrate of silver in the film to the metallic state. This is precipitated in the nascent condition upon the exposed particles of silver chloride. The longer the image remains under development, the larger will the particles of metallic silver become.

I said that bromide plates could be made to yield red tones if the silver salt were in a very finely divided state. In practice only coarser-grained plates are used, because they require less exposure for production of the image. The physical process by which the coarseness of the grain of a dry plate is determined is one of great importance in their manufacture.

If an aqueous solution of nitrate of silver is poured into a solution of gelatine and potassium bromide, the same chemical process occurs as when plain solutions of the two chemicals are mixed. The solution becomes cloudy and milky. If allowed to stand, the silver bromide is not precipitated, but held in suspension, and consists of very fine particles supported by the gelatine in solution. This is called an emulsion. The silver bromide is not actually dissolved, for the gelatine is no more able to effect this than the water. If the emulsion is examined with a microscope, particles are discovered which, from their minuteness, fail to precipitate.

This is the principal difference between a true solution and an emulsion. In the former case the substance is divided to such an extent that, under the greatest possible magnification, no definite particles can be discovered. In the case of colourless salts, as, for instance, table salt dissolved in water, there is no apparent difference between it and plain water.

Emulsions possess properties which differ considerably from those of solutions, because of the difference in size of the merely floating particles as compared with those which are actually dissolved. The most important of these in photographic practice is ripening. If the emulsion is kept warm for some time, so that it remains in the fluid state, the grain will become coarser; the single particles form aggregations. Eder has shown that the grain of a bromide emulsion in the fluid state increased in diameter from 0.0008 to 0.0003 mm. After the lapse of fourteen days small clots of 0.02 to 0.04 mm. diameter were formed, and these were visible to the naked eye. The increase in coarseness of the grain is considerably accelerated by heat, and dry-plate manufacturers therefore boil the emulsion. A distinct indication of the progress made in ripening an emulsion is the change of colour by transmitted light. Immediately after mixing, the colour of a thin film will be yellowish-red, but later it will turn to reddish-violet, and finally to grey-violet and grey-blue.

If glass plates are coated with unripe and ripened emulsion, the former will require many times more exposure than the latter to produce a similar image after development with the same developer. *The emulsion when ripened yields more sensitive plates than in the unripened state.* This is the cause of the grain perceptible in negatives taken upon very sensitive plates. (This is especially noticeable in enlargements, and it is therefore desirable in practice to use slow plates for negatives which are to be considerably enlarged.)

There is apparently no chemical change in the process of ripening. The silver bromide is perfectly formed at starting, and the particles have only grouped themselves into larger aggregations. If the ripening is carried too far by keeping the emulsion warm for too long a time, the grains of bromide will become so large that the gelatine cannot hold them in suspension. They will then be partly precipitated. But before reaching this stage the emulsion will be useless for the preparation of dry plates, and fog will result upon development.

It has been supposed that the size of the particles of silver bromide emulsion before exposure determined the grain of the metallic silver forming the negative. But this need not be the case.

In the first place it is possible that the particles of silver bromide are not wholly reduced by the developer. Secondly, it is possible that the grain becomes coarser by precipitation of nascent silver. Thirdly, the particles of silver in the film may agglomerate and form larger aggregations. With regard to the first point, it is first necessary to refer to modern ideas concerning the process of development of the latent image. Whether we agree with Eder (sub-bromide theory), or with Abegg (nascent silver theory), it must be conceded that less silver is affected by light than is reduced by development. As some time is necessary for the reduction to spread to the unaffected bromide, it must be inferred that the aggregations of silver bromide are not always com-

pletely reduced. This would imply a reduction in the size of the grain. No microscopic investigation of this has yet been made, but the behaviour of chemically developed chloride plates (as used for lantern slides) appears to indicate the correctness of this supposition. With short exposure these yield greenish-black, and with long exposure red tones. An accurate examination of the case shows that the time of exposure is quite secondary in the production of tone. In reality it only depends upon the time of development, which, of course, must differ according to the exposure. The image was found to be redder in tone in proportion to the shortness of development, and the redness of colour always points to silver in a state of very fine division.

A growth in the grain of the image will only occur when there is physical, in addition to chemical, development, that is to say, when a free salt of silver is reduced by the developer and the nascent silver is precipitated upon the exposed particles of silver bromide. The free silver salt, which plays the important part in this process, may be produced by adding such chemicals to the developer which have the power of reducing silver haloids.

Two such instances occur in photographic literature. Neuhaus states in his *Researches concerning Lippmann's Colour Photography*: "It has hitherto been supposed that suitable plates for this process are and must be grainless. The bromide plates prepared according to Valenta's and Lumière's formulæ (mixing temperature of the emulsion 40° C.), which render colours in the best possible manner, have a distinctly perceptible grain. *The size of the grain before and after development is not the same.* Before development the measurement is 0.0001 to 0.0003 mm. As the half-wave lengths of light to which the eye is sensitive range between 0.00019 and 0.00038 mm., it is evident that the grain is of the same average diameter as the half-wave lengths. Under the influence of ammonia the grain coarsens remarkably in the process of development. The diameter after development amounts to 0.0005 to 0.0015 mm., and is consequently considerably more than the half wave-length."

The second instance is taken from Schumann, who had to pay especial attention to the size of the grain in making his noted spectrum photographs.

He exposed a plate normally, and cut it into three parts. The first was developed with a normal pyro developer, the second was developed with a small addition of bromide of potassium, and the third with a large addition of the same. The well-known effect of the bromide became perceptible, and the third strip showed very considerably more contrast than the first; but an unknown property of the bromide of potassium was observed, and its power to increase the contrast may be only secondary. The first strip was very fine in the grain, and its structure could only be seen with the microscope. The third strip, on the other hand, was very coarse, the particles of silver being separated by clear gelatine and almost as large as the grain of a process print. The second plate had an intermediate grain. Schumann expressed the idea that the potassium bromide had dissolved a small quantity of silver bromide, that the developer had reduced the silver, and that the latter in the nascent state had deposited upon the image, as in the process of physical development.

I think it necessary, however, to point out that, in both cases, emulsions of extremely fine grain are involved. The individual particles can be reduced completely with greater rapidity than can be the case where the grain is coarser. With the latter, however, the loss of silver from imperfect reduction may be greater than what may be gained from the nascent silver. We should not therefore expect similar intensification in the case of very sensitive plates.

But the possibility is not excluded that nascent silver produced in this way plays some part in certain processes of development. A very small quantity of hyposulphite of soda is sometimes added to the developer to obtain as much as possible from an under-exposed plate. Probably this dissolves a small amount of silver bromide, which is then reduced by the developer. It is not necessary that there should be a perceptible intensification of the image. Perhaps the fresh nascent silver only contributes to the chemical development.

Should not sulphite of soda, which is also a solvent of the silver haloids, act in a similar manner?

The third possibility by which the grain may increase in size will be apparent to those who have overstepped the mark in drying a negative by heat. If the film does not reach the melting point, there is generally a visible intensification of the image, the film becomes so coarse in the grain that the particles are distinctly visible. Exactly the same thing may happen when a much under-exposed plate is left for some time in a strongly alkaline pyro developer. In both cases the film is softened, and this permits the particles of silver to agglomerate.



## WHAT NOT TO DO IN PLAIN SILVER PRINTING.

*[Journal of the Photographic Society of Philadelphia.]*

In the older descriptions of the plain silver process the point most emphasised was to "keep the image on the surface," for, it was said, if the image be allowed to sink into the fibre of the paper, dulness and flatness will result. This idea was partly due to a misconception, and partly to a different standard of work in those days. It is true that if a sheet of ordinary photographic paper be salted by long floating or immersion in such a manner that the salt penetrates well into the fibre, and then be sensitised by the usual short floating, the prints will likely be flat and "sunk-in" looking. But is this due to the fact that the image is not confined to the surface? No; it is because there is so much salt present that there is not sufficient excess of free silver nitrate to properly sensitise the silver chloride: for it is a well-known fact that, while silver chloride alone readily darkens to a certain tone, it does not reach the full depth except in the presence of silver nitrate. If this paper be soaked in the silver bath until an excess of the latter salt obtains throughout the entire thickness, it will then be found to print properly, and without any sunk-in appearance, though here, certainly, there can be no question of the surface image. So far from a thin, superficial image, tending to brilliant blacks, the reverse is the case, since the thicker the sensitive film the thicker will also be the resulting deposit and the more thoroughly will it obscure the white colour of the underlying paper. A mealy black is simply one in which the deposit is so thin or imperfect that the paper can be seen through it.

But, as has been said, another factor made itself felt in the precept to keep the image on the surface; by so doing greater sharpness could be obtained in the detail. This is true, for it is evident that, as the action of the light penetrates into the paper, the distance between the negative and that stratum of the paper where the printing is going on is constantly increasing, and therefore the image must become less sharp, just as it would were we gradually to withdraw the negative. In the old days this was a consideration of importance, for, if the negative and print were not microscopically sharp all over, the work was a failure. But with the advent of the platinotype all this was changed, and we have come to recognise that the merits of a picture are not gauged by the amount of incisive detail which can be made out per square inch of surface.

Such appears to have been the origin of the mistake, and it has been diligently spread and perpetuated. One of the most prominent professional photographers in this city told me a few days ago that he would like to make plain silver prints, but, after trying a number of different papers, had been obliged to give up the idea, because he could find none which would keep the image sufficiently on the surface to give the proper brilliancy, and asked me what I thought of resizing the paper with glue. I do not say that it is impossible to get good, rich blacks from a superficial image, for, with carefully prepared paper, a suitable negative, and, not least important, a suitable light, it undoubtedly is sometimes possible to get fine results. We have all seen such. But the difficulty of making a really first-class print is so great, compared with the ease by which any number with purplish-gray tones or mealy shadows may be turned out, that one rarely sees silver prints exhibited. But once use a rough-surfaced, slightly bibulous paper, get the print well into the fibre, and the difficulties disappear. Any hard-textured, firmly compressed paper is to be rejected. Ordinary photographic paper is not very satisfactory. The best which I have ever found was the old cold-pressed Whatman drawing paper, made ten or fifteen years ago. So far as I know, however, this cannot be obtained. The present Whatman "N" is very soft, and gives beautiful results, but lacks the strength and coherence necessary to withstand the long immersion in the different solutions and wash water incident to silver printing. If one tries to use it without sizing, about half the prints are lost before they have been sufficiently washed, and sometimes soften to such an extent that in lifting from one dish to another the piece taken hold of tears off before the print has been raised from the liquid. This difficulty can be remedied by sizing, though only with some loss of the soft effect. However, if the sizing be kept at the lowest limit, the difference is not very noticeable, and we obtain a paper which is capable of readily yielding beautiful prints. The examples which are in your hands this evening were made on this paper, according to the following formulae:—

Whatman "N" paper is soaked for about eight minutes in—

Gelatine .....	2½ drachms.
Sodium chloride .....	2½ "
Water .....	30 ounces.
Chrome alum (ten-grain solution) .....	1 ounce.

Care must be taken to watch for air bubbles, so that they can be promptly removed, and the paper is best turned over once or twice in the bath. It is very desirable to use chemically pure sodium chloride, as, if the ordinary domestic article be employed, the salted paper will not keep, owing to the presence of magnesium chloride, which is found in table salt. On account of the hygroscopic qualities of the magnesium salt, the paper is always damp, and decomposition is likely to result.

After the paper is dry, and shortly before printing, sensitise by brushing freely with the following solution:—

Citric acid .....	120 grains.
Nitrate silver .....	70 "
Water (distilled) .....	1 ounce.

As soon as the paper has once more become dry it is ready to print, no fuming being necessary. The printing is carried rather farther than for albumen, and thin negatives are much better exposed under green glass. As it is difficult to get such glass free from blebs and other imperfections, the following plan, suggested to me by Mr. Ives, may be used instead: Fix an unexposed gelatine plate, wash and soak in a strong solution of naphthol green. This stains the gelatine film, and when dry it answers every purpose of green glass. After printing, wash thoroughly until all the free silver nitrate is removed, and tone in any suitable gold bath. The present prints were toned with the common bicarbonate bath, used a little weaker than usual, or about 1 grain gold chloride to 16 ounces of water. In a strong bath the prints tone so rapidly that it is difficult to stop at just the proper point. If a pure, neutral black be desired, the toning is carried a little farther than for albumen. The treatment after toning is the same as for albumen.

The only objection which can be made to the use of absorbent paper is that more silver is needed to sensitise and more gold to tone. Thus, a little less than two ounces of the sensitising solution are required for one dozen 6½ × 8½ prints, and about three grains of gold chloride. The cost of the above quantities will be about thirty cents, while the paper itself cost 13 cents more. If we allow 5 cents more for the salting bath, hypo, and incidentals, we get a total of 48 cents per dozen. This estimate is based on retail prices, and by judicious buying can be considerably reduced. As here given, it will be found about one-third less than bromide or aristotype, and less than half as much as platinum. So that, even in the expensive form advocated, silver printing is still the cheapest process by which first-class results can be obtained. In practice the advantage in cost is still greater, because with silver almost every piece of paper exposed results in a good print, which, except in the most skilful hands, cannot be said of most processes. As to the results to be obtained, I prefer to let them speak for themselves. No. 1 is from a flat, weak negative, that will scarcely give a platinum print. No. 2 is from a good negative, full of rich half-tone, but with almost clear glass under the bridge. No. 3 is a well-known view chiefly composed of black and white. It and the shadow in the preceding show what can be done with blacks, and the three taken together cover about the entire range of practically useful black tone values. No. 4 is a print from a rather hard negative on Whatman's "N" paper without any sizing, but the same quantity of salting. Of course, I do not claim any originality in regard to the idea of using drawing paper to make prints on, but if the direct stand which is here taken, in opposition to the idea of keeping the image on the surface, shall have some effect in doing away with this popular, but, as I believe, hurtful, delusion, I shall feel that this paper has served a useful purpose.

DR. CASPAR W. MILLER.

## TRICOLOUR TRANSPARENCIES FOR PROJECTION AND THE STEREOSCOPE.\*

## B.—The Staining of the Gelatine Images.

THE colouration which gelatine assumes in solutions of dyes is not, as is generally believed, produced by the absorption of the liquid, but must be ascribed to a chemical combination, if only a loose one, with the dye.†

For this reason also all dyes are not suitable for colouring gelatine images, and, as in dyeing material, certain dyes must be used in an acid, others in an alkaline solution. For instance, gelatine is not coloured at all by iodine green in an acid solution, whilst Höchst Neublau will stain only from acid and not from alkaline solutions. The gelatine thus sometimes plays the rôle of an acid, sometimes that of a base, and combines with the dye bases or acids and forms coloured compounds of the character of salts. As a rule, however, it will take acid dyes more readily, and therefore these are to be preferred for staining the gelatine images. The eosines, the rhodamines, and all the sulphonic acid dyes, are therefore excellent stains for gelatine. As the commercial dyes are potassium or sodium salts of these acids, the addition of a little acetic acid to their solutions, which causes a decomposition of the salts, renders the dyeing process considerably easier, whilst the presence of a strong alkali quite stops their staining power.

The combination of the dye with the gelatine is, as already mentioned, only very loose, and even continuous treatment with water is sufficient to produce a gradual discolouration.

It is possible, therefore, to wash the coloured gelatine images with acidulated water without altering their colour; by treatment with pure water the colour may be weakened, and with dilute ammonia the pictures may be entirely decolourised.

The following dyes, with the addition of acetic acid, are specially suitable for staining gelatine:—

Xylinin ponceau or Bleibrich scarlet stain a scarlet red corresponding to the spectral colour between B and C.

\* Continued from p. 471.

† Hübl, *Die Dreifarben Photographie*, p. 141.



Methyl orange stains a yellowish-orange, corresponding to the spectral colour at D.

Naphthol yellow SL, stains a pure yellow.

Acid green stains green, with a faint bluish tinge. This colour is complementary to that produced by xylidin ponceau.

Echtgrün bläulich produces a tone midway between blue and green, which corresponds to about b<sub>1</sub> F.

Methylene blue stains a blue with a faint greenish shade, which is complementary to the orange of the D line. This colour corresponds to Paris blue.

Höchst Neublau stains a purer blue, which almost corresponds to ultramarine, but in comparison with this, which must be called a pure blue, is slightly greenish.

The various dyes belonging to the eosine group produce bluish-red tones, and can be used in neutral solution. The ordinary so-called yellowish eosine stains a pure red, similar to carmine, whilst erythrosine gives a red colour with strong blue tinge or a purple colour.

By mixing these dyes gelatine films may be stained in any colour, and, as an example, we may quote the light-filters already described.

The colour imparted to the gelatine almost always alters in drying the picture; the red colours become bluer, and the blue greener. Thus, for instance, a film coloured with echtgrün bläulich, whilst still wet, is a peacock blue colour, corresponding to the spectrum line F, whilst when dry a blue green, which lies nearer the green between b and F, is formed.

Almost all organic dyes exhibit the peculiarity that with increasing concentration they become mixed with red, therefore a gelatine picture coloured with erythrosine appears almost pure red in the shadows, whilst the lights shade off into purple. With a blue-stained picture the shadows show less of a greenish tinge, and a yellow picture shows the deepest shadows orange. For these reasons all the deep shadows generally appear reddish in transparent three-colour pictures; a dark blue velvet drapery, for instance, shows in the folds reddish-brown instead of black shadows. This fault is only recognisable, however, with intense illumination of the picture, for with a light that is not too bright the deep shadows appear opaque, and therefore black.

For colouring the three gelatine images obtained as described above the following solutions may be used:—

For the red—	
Water.....	100 c. c.
Alcohol.....	30 "
Erythrosine solution (1 : 200) .....	5 "
For the blue—	
Water.....	100 "
Alcohol.....	30 "
Echtgrün bläulich * solution (1 : 200) .....	15 "
Methylene blue " (1 : 200) .....	2 "
Glacial acetic acid .....	10 drops.
For the yellow—	
Water.....	100 c. c.
Alcohol.....	30 "
Naphthol yellow SL.† (1 : 200) .....	10 "
Methyl orange (1 : 200) .....	10 "
Glacial acetic acid .....	10 drops.

The picture to be coloured should be laid in a dish and flowed over with the dye solution and allowed to remain till it is saturated with colour, which will take about half an hour. It should then be removed, allowed to drain well, and then placed in the following washing solution:—

Water.....	100 c. c.
Alcohol.....	80 "
Glacial acetic acid .....	80 drops.

If celluloid films are used there should be added also—

Glycerine .....	10 c. c.
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in order to keep the films supple after drying. This solution removes all the dye which has not combined with the gelatine without weakening the colour.

The pictures should be left in the washing water for one or two minutes, and then allowed to dry.

If the high lights of the picture, which should be white, appear stained, they may be cleared by treating with water. The picture should be placed in a dish filled with water, and allowed to remain, with constant rocking, till the lights when looked through appear white, and then it should be transferred to the above washing solution in order to stop the reducing action of the water. If it is desired to weaken the picture very much or to completely decolourise it, a few drops of ammonia should be added to the water.

By alternate treatment with the solution of dye and with water and ammonia, the shading may be varied within tolerably wide limits, the picture may be coloured "hard" or "soft," and thus compensate to some extent for differences in the negatives, and for small faults in the time of printing and preparing the gelatine prints.

If the negatives were too dense or printed too long, it is not easy to

obtain sufficiently modelled shadows. It is advisable, therefore, in such a case, to more than saturate with colour by leaving the picture in the dye solution for a long time, then to treat with water till the bright half-tones are decolourised, and finally to again stain for a short time.

If the coloured pictures are superimposed when dry, the result is rarely satisfactory, and it is almost always necessary to correct one or other of the pictures by clearing, reducing, and restraining as above described.

#### *The Superposition of the Separate Pictures.*

For the final combining of the celluloid films, a resin solution is required, but it must be noted that alcohol, benzole, chloroform, or ether, cannot be used, because these liquids soften and deform the films. The best thing to use is a solution of Canada balsam in petroleum benzine (1 : 1).

The blue print should be laid on a sheet of glass with the film side away from it, and the edges fastened down with strips of gummed paper; then, by the aid of a soft camel's-hair pencil, the balsam solution should be spread over it tolerably thickly, and on this should be laid the yellow picture, which should also have been coated with the solution, avoiding, of course, air bubbles, and the latter shifted till the outlines of the two pictures absolutely coincide; and a magnifier will be useful at this point. Then the position of the yellow print should be fixed with strips of gummed paper, and the red picture cemented down in the same way.

After some hours the edges of the combined picture should be cut and placed on a sheet of glass in the correct position for the stereoscope, a cover glass put over the same, and the edges bound with binding strips.

The Canada balsam between the films dries very slowly; but this is of no moment, as the pictures are not exposed to a high temperature.

The combination of the mica lantern pictures is effected without any medium, merely by superposition and binding with gummed paper. In one corner of the glass picture should be placed a small piece of wax, the mica picture should be placed on this, and shifted till the outlines coincide, and the position fixed by means of gummed strips of tissue paper. The wax is only used to temporarily hold the two pictures together. In a similar way the second glass picture is now fitted, and the whole fastened together at the edges by gummed binding strips.

#### *C.—Other Methods for the Preparation of Three-colour Transparencies.*

1. Very meagre details have, up to the present, been given of Dr. Sells's process. A glass plate is coated with collodion, and on the film thus formed, which gives the actual image-bearing film, a gelatine solution mixed with a bichromate is poured, and allowed to run off. When dry it is printed under a negative, washed in cold water, and the plate placed in the solution of a dye which is only absorbed by those places which are altered by the action of light. The oxide of chromium formed should act as a mordant and hold the dye fast. After drying, the collodion skins carrying the coloured pictures are stripped from the glass, and bound together by a sticky material.

The process is especially simple, and makes the formation of pictures of absolutely identical size, so that the images at once coincide. It appears, however, that vigorously printed proofs are very difficult to obtain in this way, because the behaviour of the exposed and unexposed chromate gelatine differs so slightly towards dyes.

It is also questionable whether this difference in behaviour of the exposed and unexposed places towards the dye solutions can actually be ascribed to the action of the oxide of chromium. We understand by mordants in dyeing materials that they possess the power of combining with the dye, of taking up the dye and forming with it an insoluble compound. Cotton or linen fibres cannot be dyed by immersion in solutions of dyes; therefore they are mordanted—that is, they are impregnated with iron, aluminium, or chromium oxide; thus bodies are placed in the fibres, which combine with the dyes to form the so-called lakes.

But gelatine does not require a mordant in this sense; it takes up, as has already been mentioned above, most of the dyes without any hesitation, and can itself also, like albumen, be used as a mordant. From some experiments made in order to clear up this behaviour, it appears that the possibility of Sells's process is to be ascribed not to the mordant action of the oxide of chromium, but to the difference in the swelling power of exposed and of unaltered gelatine.

The unexposed gelatine is, to a certain extent, permeable by liquids, whilst the gelatine tanned by light which has lost its power of absorbing aqueous solutions will not permit of the penetration of liquids. If dry gelatine films are treated with solutions of dyes, the film tanned by the oxide of chromium will be coloured more slowly, because the liquid only penetrates slowly. If, however, the unaltered film has been previously allowed to swell in water, it takes the dye slower than the tanned film, because the absorbed water prevents the penetration of the solution. If the coloured films are then treated with water, the unchanged gelatine gives up its dye more quickly than that exposed with the chromate, because the latter can scarcely be penetrated by the water.

By treatment of the still wet gelatine print with dye solution and subsequent washing, a coloured picture can be obtained.

2. *Lumière's Process.*—If a bichromated gelatine film on glass, paper, &c., be exposed under a half-tone negative, a useful image cannot be developed with warm water, because the insoluble part which lies on the

\* Obtained from the Farbenfabrik vormals Friedrich Bayer & Co., Elberfeld.

† Obtained from the Aktiengesellschaft für Chemische Industrie, Basle.



surface of the gelatine film will wash away. If, however, there be added to the gelatine a body in a fine state of division, and only a thin film be used, half-tone positives may be obtained. The possibility of this is now generally known by the gum-bichromate process, which is used by many. A mixture of gum bichromate, a colour in powder, is spread in a thin film on paper, then printed under a negative, and developed by washing with water.

Very similar is the method for preparing colourless gelatine images introduced by Lumière, only in place of a colour, silver bromide is used, which is removed after development by a solution of hypo.

In the patent specification of this process only general statements are found, according to which one can proceed in the following way: A sheet of glass is first coated with collodion, and then coated with a solution of gelatine, gum, fish glue, and so on, to which a chromate and some silver bromide has been added, and allowed to drain, so that only a very thin film is formed on the collodion skin. When dry it is printed under a negative, developed with warm or cold water, according to the solubility of the substance chosen, the silver bromide removed by hypo, then it is washed with water, and finally the transparent picture dyed with the solution of an aniline dye. After drying with the image on, it can be stripped from the glass plate.

The author, however, has not been able to succeed in obtaining satisfactory results in this way. If the reproduction of the half-tones is better than with the gum-bichromate process, because finely divided silver-bromide emulsion is used, and not a heavy colour powder, as in the latter, the pictures are, however, imperfect, and the transition to pure white coarse and abrupt.

Moreover, Lumière does not prepare three separate pictures and then superimpose them, but prints the three negatives one on top of the other in the correct colour. There is laid thus on a suitable support, such as a sheet of glass, first a gelatine film containing silver bromide, to which a red dye has been added. This is then printed under the corresponding negative and developed with water. The red positive thus obtained is then, after drying, coated with collodion or some other insulating medium, and on this another chromated gelatine film, which contains the blue dye, is poured. It is now exposed under the second negative, the blue picture developed, insulated with collodion, coated with a chromated gelatine film containing the yellow dye, and the third negative printed. After development, a finished three-colour picture should be the result.

As will be seen, this procedure coincides exactly with the trichromatic gum-bichromate process, and whoever has tried this will certainly doubt the utility of this method. Even if the chromated silver-bromide gelatine film will give faultless half-tone pictures, it is hardly possible to obtain in this way absolutely satisfactory constituent pictures, since their character is considerably influenced by the time of printing and the process of development. The printing of the one over the other of the pictures with absolutely coincident outlines can hardly be obtained.

The coloured stereo and lantern transparencies placed on the market by Lumière, which are the best which have hitherto been given by the indirect process of photography in natural colours, can scarcely be produced in this way. The extraordinarily high relief of the picture, as well as the easily seen mountant between the three individual pictures, speaks against this. These pictures are probably produced by means of the Woodbury process, a process which may be used with advantage if a large number of coloured pictures from the same negative are required.

3. *The Preparation of the Separate Picture by the Woodbury Process.*—In the process just described the colouring of the three individual pictures must always be separately estimated, and, as has already been mentioned, a subsequent colouration or reduction of the picture is almost always necessary in order to obtain a satisfactory final result. The process is tedious, and therefore less suitable for the preparation of a large number of similar pictures. The Woodbury process presents, on the other hand, the possibility of producing any desired number of equal constituent pictures in a comparatively simple way. The three negatives give, in the usual way, by forming the gelatine reliefs, the Woodbury printing plates, from which proofs on transparent films, such as collodion skins, can be prepared with red, yellow, and greenish-blue gelatine. The intensity of the colour which must be given to the gelatine solution used for the printing must be determined by experiments. If this be done, there ought to be no difficulty in making any number of tolerably equal pulls.

The constituent pictures thus obtained may be fastened together by any suitable mountant.

As has already been mentioned at the beginning, very much better results can be obtained by the above-described methods than by three-colour printing. In the execution of the latter we want the brilliant pure printing inks, and, moreover, the printing plates always show more or less considerable variations from the gradation of the negative, through which very troublesome faults in the reproduction of colours occur. The three-colour transparencies, on the other hand, are formed by a simple copying process, and the process of colouring gives opportunities to correct the gradation in a suitable way.

Obviously, however, a certain discretion is introduced into the process; but this exists in all photographic and photo-mechanical processes.

Every operation must be performed with manual skill, and with the idea of what is to be aimed for, and almost always retouching is necessary to correct the mechanical part of the process.

This will always be associated with photography, and it is quite unfair to expect a reproduction true to the original by colour photography, which cannot be found in a monochromatic photographic picture.

We know that a faultless photographic reproduction of a grey in a picture painted in grey is scarcely attainable, and we are satisfied with a copy which corresponds on the whole with the original without noticing the defective units in the gradation. This concession must also always be made in colour photography. Here also we ought not to require an absolutely truthfulness of colour rendering, but must content ourselves with a picture whose colouring corresponds, on the whole, with the original without insisting on an exact test of its absolute correctness.

## CARRIERS AND CUT FILMS.

At first starting one might well say that there is now no necessity to sing the praises of films—cut films, that is. But the fact is, many workers look at them with something akin to timidity. We can show them some marvellously fine results (for the films of 1899 are more than ten years better than the films of 1889), but there are still many who hesitate.

The price is largely to blame for this; besides which, in order to work them with the most comfort, certain extra appliances are essential. Of course, they may be dispensed with by the more experienced worker, but I am speaking now of labour-saving contrivances, such as film "lifters," "clips," and "hangers," the sort of accessory which our friend Mr. Tylar delights in making; many people would consider these as distinctly necessities and object to the expense of them; added to the extra cost of films (fifty to seventy-five per cent. over the cost of plates) it means a considerable increase in one's yearly outlay, when, from the strictly amateur point of view, there is nothing to be put down to the credit side of the account.

I have for some weeks been using a magazine camera, fitted with carriers for plates or films, a very convenient and satisfactory arrangement. I regret it is not allowable to mention names here, but surely there could be nothing simpler in the way of a changing system. The advantage of being able to use plates or films indiscriminately is no small one.

Film carriers are made practically on the same lines as those for plates, only about half the thickness. Now, when using plates there is (in this camera) little or no risk of jamming, because the glass being of a certain weight will always keep its place. With films, on the other hand, if the camera (as it must often be) is subjected to much vibration, there is a possibility of one or more films rising, or being shaken above the proper level, and thus causing a block in the routine of changing, and, worse still, the film cannot be coaxed back into its place by gentle tapping, as would the plate; in fact, the more vibration, the worse the block, and when this occurs there is nothing for it but to cease operations until the recalcitrant film has been, in an extemporised (or other) dark room, put in its place. It is only necessary once to go through such an experience to start one on the track for a remedy—in other words, we want some simple means of fixing the film in the carrier to entirely prevent any movement in the vertical direction. I tried small discs of gelatine and gummed paper, and small clips made of aluminium, but finally took to the following method: Each carrier has a small hole drilled at the top, the hole ( $\frac{1}{16}$  inch diameter) to be visible when a film is properly inserted, and drilled from the back so as to leave a thin turned-up edge of metal on the face of carrier, which edge is in itself a safeguard, if we can rely upon the film being quite flat. As, however, this is not invariably the case, I make the film more secure by a small plug of wax, which overlaps the top edge of film to a small extent, and is pressed through the hole level with the surface of metal—the hole, being slightly under-cut, holds the wax firmly, and, the carriers being drilled alternately to right and left, no two wax plugs need touch; a very small piece of beeswax (readily softened in the hand)—paraffin wax would be better and harder—serves the purpose. I may interpolate a word of advice here to those who may use these "plate-and-film" carriers, and that is, if on tour and working films, do not on this account leave the plate carriers at home; it may happen, and accidents and other untoward events may occur, that we are stranded somewhere and no more films to be had, whereas every dealer keeps plates. I had the whole of a lovely day wasted recently because of this neglect—a packet of films lost on the way, missed when too late, no more films to be had; plenty of plates, but no carriers to put them in!

In practice it is by no means indispensable to have lifters and other frames for holding the films during development. Having by adjustment of stops and regulation of shutter got approximately even exposures, it is a common practice with me to develop four quarter-plates at a time in a whole-plate tray. They are, even in a special four-division tray, inclined to float one over the other unless special precautions are taken, and having several dozens of films to treat, the difficulty was overcome by first drilling holes in the ebonite tray and inserting wooden plugs to mark the divisions; divide the tray with rule and pencil into four equal parts, then drill



holes ( $\frac{1}{16}$  inch or so), four in the longer line, equidistant, and two in the shorter line at about one and a half inches from the sides. Now put in plugs, which should stand up half-an-inch or so, and be, of course, level on the under side. These little uprights effectively prevent the films from floating one over the other, or overlapping during the necessary rocking of the dish during development. At the same time, the solutions will flow uninterruptedly in any direction. An ebonite tray is by no means spoilt by being treated in this way, as the holes can be readily and effectively plugged with wax, and no one be the wiser. With deeper dishes and more solution there is very little risk of damage to these films by abrasion, even when they are allowed to lie one over the other—ordinary care being used, of course, to remove them from the top layers, and if placed back to back, the usual troughs and racks will be a great help to perfect washing. When we come to the risky operation of drying, we find the small metal clips extremely serviceable and helpful.

J. PRIKE.

### AN IMPROVED MICRO-STEREOSCOPIC CAMERA.

[Paper read before the Photographic and Microscopic Branch of the Franklin Institute.]

I HAVE pleasure in showing you this evening a new camera which I have constructed for the purpose of making stereoscopic pictures of small objects.

To accomplish this end has taken much time and a great amount of experimenting. I first fitted up my stereoscopic camera for the purpose, but the result was not at all satisfactory, although I made some very fair negatives with it. The camera proved to be altogether too short, and the lens and object had to be changed from one side to the other, all of which made it very inconvenient. My next attempt is embodied in the instrument I have here this evening for exhibition. It was originally one of Anthony's lantern-slide cameras, which I have altered to what you now see. The shutter used is a 4×5 "Victor," made by the Bausch & Lomb Optical Company, of Rochester, N.Y. To the front of this I have fitted an attachment to carry the lens, and also to hold a reflector for properly illuminating the object. In the rear of shutter I have, instead of a lens, a ring, to cut off deflected light that might be caused in its passage through the shutter. The rear end of the camera has been fitted up to receive a 5×7 plate-holder, but in such a way that it may be used in two positions, so that each end of the plate may be exposed independently of the other. The plate-holder rests against a partition with an opening in it of a size just sufficient to cover one half of the plate.

The lenses for very small objects are achromatic objectives that are used in the microscope, but for this work are changed somewhat, to better answer the requirements. The trouble I found with them for this work was their narrow angle and extremely small depth of focus, and both of these faults had to be remedied before I found it possible to make a satisfactory negative.

I also found that the rays of light, in passing through the lens, had a tendency to fog the plate by coming in contact with flat surfaces, even when these were blacked with the greatest care. I overcame this trouble satisfactorily by dispensing with the flat surface, i.e., by making them on a bevel, with only the sharp edge to reflect the light. To do away with the difficulty arising from the small depth of focus, the only way was to stop down the lens.

Now, as the depth of some objects is very great in proportion to the focal length of the lens, I was compelled to use a very small stop. (I use the word "stop," as I understand it to mean an aperture placed close as possible to the lens.) The smallest stop I use is  $\frac{1}{16}$  of an inch in diameter, with the edges of the opening made very nearly sharp and carefully blacked. The rear of the lens has also to be guarded to prevent deflections, which in this work would be very serious.

Of course, the time of exposure requires to be lengthened in proportion to the size of stop; the smallest stop sometimes requires as much as forty-five minutes, and as each exposure must be separately made on the plate, the time will be doubled, making for the two exposures ninety minutes.

Now, in regard to the object to be photographed. Let us suppose it to be a small insect. I place it in a bottle containing cyanide of potassium, which soon ends its life; I then set it up on its feet, in a position as nearly life-like as I can, on a small piece of opal glass, and, to hold it in position, I fasten each of its feet down by means of wax; this is done by using a very small tool, heated in the flame of a spirit lamp. After the feet are fastened properly, the surplus wax is carefully removed by scraping it away with a fine-pointed knife. The object now is ready for the camera, and upon the pedestal in front of the lens the mounted object is made fast. Now, this pedestal, upon which the mounted object is fastened, has a rack-and-pinion movement, so as to elevate the object to the required height, and has also a ball-and-socket joint on the top, so that the object can be placed in any desired position. The image on the focussing-glass is brought in position horizontally, by sliding the lens and board, which can be done by turning the milled head on the top of the camera.

Now, to make the exposure. After everything is ready, I place the object in its best position, and focus as sharply as possible, with the image in its proper place on the ground glass. On the front end of the

camera, at the bottom of the pedestal, is a small milled-head screw, which should be turned until it brings up against the shoulder under the camera. This arrangement is for the purpose of permitting the removal of the lens from the object, and its return again to exactly the same place, so that there may be room to change the stops. The reason for doing this is that, after the small stop is in place, it is impossible to see any image whatever on the ground glass.

Now I fasten front and rear of camera (after the proper stop has been put in place) by means of the clamp screws at the side, and run in the plate-holder until it drops into the first groove, then set the camera in position with the reflector facing a northern sky, and make the first exposure.

After the first exposure is made, the stop is removed, and upon the pedestal will be found a graduated circle, divided into parts of 5° each, and also a pointer. This pointer is now to be moved round one of the graduations from left to right, and then the image on the ground glass again placed in position. The stop is put in place, plate-holder is returned and run back as far as possible until it drops into the second groove, and the exposure repeated for the other end of the plate. By revolving the object in the direction just mentioned, the negative itself is made stereoscopic, and can be placed in the 'scope and examined to see if it is perfect.

For objects that are nearly the full size of the picture wanted, I use a pair of wide-angle 4×5 lenses.

JOHN G. BAKER.

### TRANSFERRING KODAK FILMS.

[Journal of the Photographic Society of Philadelphia.]

ABOUT two years ago I loaded up my Kodak with 100 exposures, and spent the day at Hampstead Heath, on "Bank Holiday," snap-shooting "Arty and Arriet," the costermonger and his girl. The films developed all right, yielding negatives of fine quality, but upon drying I found them suffering from smallpox, peppered entirely over with opaque spots. Examination revealed the fact that the damage was caused by the surface of the celluloid next to the film being covered with chalk dust. The films were returned to the Kodak Company, attention called to the trouble, and a request made that, if possible, the films be transferred to clear celluloid. They were returned, two only being transferred, apparently to the surface of a piece of transparent tripe. Wishing if possible to save these negatives, I made various attempts to strip off the film and transfer it to glass, and at length succeeded so well that I am now at work turning all my films into plates. The method is simplicity itself:—

Dip the film for a few moments in a 10 per cent. solution of alum. This has a tendency to contract the upper surface of the gelatine. Now lay the film on a sheet of glass, and with the fingers rub back the gelatine coating, beginning at the upper corners and working from side to side, until the film rolls off like a cigarette. This is placed in running cold water, to take out the alum, then dipped for a few minutes in a 10 per cent. solution of glycerine and water, the object being to prevent the film from peeling from the glass when dry. For a 4×5 film I use a 5×7 sheet of glass. This is placed under the stripped film in a tray of clean water, the plate lifted, the film caught, and put under running water, which immediately flattens out the film and drives out air-bubbles. Any wrinkles may be smoothed out with the fingers. When the transferred film dries, it is in all respects equal to any glass negative, all the objectionable grain being left in the celluloid. Moreover, the transferred negative may be intensified or reduced, exactly as if it had always been on a glass support. The joint in the celluloid always comes in the middle of a film negative, but, when transferred, no sign of a joint is visible.

After exposing and transferring about 300 negatives, I have come to the conclusion that the operation entails far less labour than the carrying of glass plates in the field and the bother of plate-changing.

WILLIAM N. JENNINGS.

### THE NATIONAL PHYSICAL LABORATORY.

THE realisation of the scheme for the establishment of a National Physical Laboratory, says *Nature*, is primarily due to two addresses delivered before the British Association in 1891 and 1895 by Professor Oliver Lodge and the late Sir Douglas Galton respectively. The fact that Sir Douglas Galton, when President of the Association, did all in his power to support the proposal originally made by Professor Lodge led to the matter being laid before the Prime Minister by a strong deputation. A Committee, of which Lord Rayleigh was Chairman, was then appointed by the Treasury, and, after taking evidence, reported in favour of the establishment of a public institution for standardising and verifying instruments, for testing materials, and for the determination of physical constants. They further recommended that the institution should be established by extending the Kew Observatory in the Old Deer Park, Richmond, and that the Royal Society should be invited to control it and to nominate a governing body, on which commercial interests should be represented, the choice of the members of such body not being confined to Fellows of the Society.

These recommendations were approved, and, to give effect to them, the Government undertook to ask Parliament for 12,000*l.* for buildings and for 4000*l.* a year. A scheme for the management of the new insti-



tution has been approved by the Treasury, and the first instalment of the promised grants has been sanctioned by the Legislature. The Kew Observatory Committee are willing that the Institution which they have managed very successfully should be merged in the National Physical Laboratory, which will thus become possessed of an endowment of 458*l.* per annum from the Gassiot Trust and of an income of about 2700*l.* from fees for standardising. The receipts have, in the past, rather more than covered the expenses of carrying on the work of the Observatory.

The ultimate control of the National Physical Laboratory is placed in the hands of the Royal Society, but the constitution of the bodies which manage it directly can only be altered with the consent of the Treasury. These are an Executive Committee and a General Board. The latter is a relatively large body, to which the Executive Committee must report annually, and to which it must submit its scheme of work for the next year. An essential feature in the constitution of the General Board is that twelve of its members are nominated by six of the great technical societies, viz., the Institutions of Civil, Mechanical, Electrical, and Naval Engineers, the Iron and Steel Institute, and the Society of Chemical Industry. Six of these representatives of "commercial interests" are also to be members of the Executive Committee, which will ultimately consist of twelve ordinary and five official members, of whom the latter are: the President of the Royal Society, the Chairman of the Committee, the Permanent Secretary of the Board of Trade, and the Treasurer and one of the Secretaries of the Royal Society. In the first instance, six members of the existing Kew Observatory Committee will also have seats on the Executive Committee, but their places will not be filled up when their period of office expires. Finally, it is in the power of the Executive Committee to appoint sub-committees to superintend particular departments or investigations. The members of these sub-committees need not necessarily be members either of the General Board or of the Executive Committee.

Preliminary arrangements have been in progress for some time in order that the National Physical Laboratory should be organized as soon as possible after the requisite funds were voted by Parliament.

The six technical societies have nominated their representatives, the General Board and Executive Committee have been constituted, and general satisfaction will be felt at the announcement that Lord Rayleigh has accepted the Chairmanship of those bodies.

On the recommendation of the Executive Committee, the Council of the Royal Society has appointed Mr. R. T. Glazebrook, F.R.S., now Principal of University College, Liverpool, to the important post of Director of the National Physical Laboratory. A number of sub-committees have also been organized by the Executive Committee, which have been requested to make suggestions preparatory to the drawing up of a detailed scheme of work and of the plans of the new buildings.

The members of the Executive Committee are:—

Lord Lister, P.R.S., Lord Rayleigh (chairman), Mr. A. B. Kempe, Treas. R.S., Professor A. W. Rüchker, Sec. R.S., and Sir Courtenay Boyle (*ex officio*), Captain W. de W. Abney, Sir N. Barnaby, Mr. G. Beilby, Sir E. H. Carbutt, Bart., Captain E. W. Creak, R.N., Professor R. B. Clifton, Professor G. C. Foster, Mr. F. Galton, Professor O. J. Lodge, Sir A. Noble, Professor J. Perry, Sir W. Roberts-Austen, Professor A. Schuster, Mr. A. Siemens, General Sir R. Strachey, Professor J. J. Thomson, Dr. T. E. Thorpe, Sir J. Wolfe Barry.

In addition to the above the following are also members of the General Board:—

Sir M. Foster, Sec. R.S. (*ex officio*), Sir F. A. Abel, Bart., Professor W. G. Adams, Professor W. E. Ayrton, Mr. H. Bell, Mr. A. Buchan, Mr. B. E. Crompton, Professor G. F. Fitzgerald, Professor J. Joly, Lord Kelvin, Mr. J. T. Milton, Sir W. H. Preece, Mr. W. F. Reid, the Earl of Rosse, Dr. B. H. Scott, Mr. W. N. Shaw, Mr. C. E. Stromeyer, Admiral Sir W. Wharton, Sir W. H. White.

The following have also been requested to serve on one or other of the sub-committees above referred to:—

Messrs. E. D. Archibald, C. V. Boys, Professor H. L. Callendar, Messrs. Forbes Carpenter, W. H. M. Christie, T. B. Dalmeyer, Professor J. A. Ewing, Mr. S. Z. de Ferrant, Professor J. A. Fleming, Messrs. R. E. Froude, E. H. Griffiths, J. Mansergh, T. Matthews, W. H. Maw, Dr. L. Mond, the Hon. C. A. Parsons, Professor A. W. Reinold, Captain H. B. Sankey, Messrs. J. Swinburne, G. J. Symons, H. A. Taylor, Professor S. P. Thompson, Messrs. J. I. Thornycroft, C. H. Wordingham, and A. F. Yarrow.

It will thus be seen that the National Physical Laboratory is being founded on a wide basis. A definite scheme of work will be arranged during the autumn. The Director will, it is hoped, take up the duties of his office on January 1, 1900, and the planning and erection of the new buildings will then proceed with as little delay as possible.

#### PHOTOGRAPHY AND FOUR AT A BIRTH.

At the Sunderland County Court, last week, a novel case was heard by Judge Greenwell. John George Dixon and his wife, Agnes Annie, were the plaintiffs, and Dr. H. De Wytt the defendant. Mr. A. G. Boulton appeared for the plaintiffs, and Mr. J. T. Green for the defendant.

Mr. Boulton said that the plaintiffs claimed the delivery of six photographs promised to them by defendant or 15*l.*, together with 5*l.* for the trouble and the annoyance and risk that they had been put to by the defendant.

Agnes Annie Dixon said her husband was a draper, and they lived at 21, Smith-street, Ryhope. On May 31 last, she gave birth to four children—three boys and a girl—and she was attended by the defendant, who was assistant to Dr. Robinson. After the birth of the children defendant remarked that it was a remarkable case, and the like had never taken place in Ryhope, and that in all probability it would never occur again. He, therefore, suggested that the children should be photographed at once, as he thought they would not live long. Defendant pressed his request by pointing out that the photograph would be the only thing they would ever have to remember the children by, and that if witness did not possess a photograph of them, no one would ever believe that she had had four at a birth. He further agreed to give her half-a-dozen of the photos for herself. Under his persuasion she consented to have the children photographed. Defendant instructed the photographer, and with the children artistically arranged in an arm-chair and upon the table in the room where witness was lying the photos were taken. Next day defendant returned, and said that, in consequence of one of the babies having moved, the photos had been slightly "smudged." He therefore suggested that it would be better to have a perfect copy "when they were about it," and asked her to let the photographer take another one. Witness's husband was perfectly willing, provided witness's health would not be endangered. Defendant again promised to give them half-a-dozen of the best, and they consented to give the photographer another sitting. Witness felt the strain very much, and went into a delirium. The children had since died. Some time afterwards, they learned that the photos were being shown in the village. Her husband thought this strange, and he asked defendant when they were going to get them. Defendant replied that he was sorry, but the photographer had destroyed the negative, and he was therefore unable to fulfil his promise.

Cross-examined by Mr. Green, witness denied that her husband ever wanted to enter into a contract with the photographer to supply him with a number of photos so that he might sell them. The explanation was that a very large number of their acquaintances asked them for photographs, and as they were unable to buy each of them one, they agreed to get them one, providing they were willing to pay for them. She knew the negative was being copyrighted.

John George Dixon, husband of the last witness, corroborated, and said he never had any idea of making money out of the photographs. The very idea was repugnant to him.

Dr. Wytt, the defendant, admitted arranging for the children to be photographed, and denied ever having promised to give the parents half-a-dozen copies. As a matter of courtesy, he promised to give them a copy.

Under cross-examination, witness said that the negatives were not destroyed, they were in his possession. He considered that the sale of the photographs would be a reflection upon his professional conduct.

The Judge: How?

Witness: It was a surgical case.

The Judge: Supposing it was, it does not touch the point.

Mrs. Dixon: Yes, and you've got a photograph of them hanging in your surgery.

Wm. Sheraton Hogg, photographer, Ryhope, deposed to taking the photographs. Acting upon the defendant's instructions he refused to give any one a copy.

His Honour found for plaintiff for six guineas, to be reduced to a shilling if six copies of the photographs were delivered within seven days.

Mr. Boulton asked his Honour to make a simple order for the delivery of six copies of the photographs.

After a legal argument his Honour said he did not see any reason why the plaintiffs should not have the photographs; he therefore found for them for 15*l.*, to be reduced to a shilling if six copies of the second day's photograph were delivered within fourteen days.

## Our Editorial Table.

We have received from Mr. A. A. C. Swinton a reprint of the paper on *Electric Discharges in Vacuo and the Röntgen Rays*, which he read before the Philosophical Society of Glasgow on March 1 last.

#### CATALOGUES RECEIVED.

York & Sons, 67, Lancaster-road, Notting Hill, W.

MESSRS. YORK send us their thirtieth annual Supplemental Catalogue of lantern slides, lecture sets, &c. Cairo, Palestine, Jerusalem, Shakespeare's Avon, Berlin and Dresden, Human Vision, Sicily, Cromwell, are among the subjects of the lantern slide sets.

Thomas Illingworth & Co., The Photograph Works, Rucklidge-avenue, Willesden Junction, N.W.

MESSRS. ILLINGWORTH'S Catalogue deals with the firm's specialities in enlarging, finishing, printing, &c. Carbon effects at bromide prices are given prominent mention.



## News and Notes.

PHOTOGRAPHIC CLUB.—August 30. Open Meeting.

THE Annual Exhibition of the Ludlow Photographic Society will be held in the Assembly Rooms, Ludlow, on Wednesday, October 11.

THE following gentlemen have consented to act as judges at the Annual Exhibition held on November 15, 16, and 17, at Morley Hall: Messrs. J. B. B. Wellington, Horsley Hinton, and Harold Baker.

THE yacht *Shamrock* has gone out to America armed with a Lizar's Challenge half-plate focal plane camera. To ensure the best results being had from the negatives, they are, after exposure, to be immediately sent over to this country for development.

VANISHING OLD LONDON.—The old house opposite the Métropole Theatre, Camberwell, and familiar to South Londoners of past generations as the Eel Pie House, the Haunted House, and the Greyhound, which was the object of a visit by the members of the Archaeological Society some time ago, is being demolished. Four shops are to be erected on the site.

THE NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.—At the last meeting of the Council of the National Photographic Association, the President (Sir J. Benjamin Stone, M.P.) in the chair, 185 photographs were presented, taken by Messrs. B. Diver, Basil E. Lawrence, E. Scamell, and George Scamell (Hon. Secretary). The subjects included Elgin Cathedral, some of the old houses in and around London, Waltham Abbey, and the churches and monuments at Hendon, Ickenham, Wheatthampstead, Biggleswade, Sandridge, St. Luke's, Chelsea, &c. These will be forwarded immediately to be added to the collection at the British Museum.

"THE distinguished thing at present," says a writer in the *Referee*, "is not to have your photograph in the papers, not to be interviewed. The illustrated papers and the trashy magazines have done for that. There was a time when a 'smart' lady would have paid anything to get her photograph or the photograph of her pet dog into the papers, but they want something more than that for their money now, I can tell you. A series of photographs of the interior of your house, or a picture of yourself and your parents and your offspring? Nothing in that any longer. Even the pictures of the Finger-nails of Celebrities and the Noses of Eminent People, and all that sort of thing, must come to an end, and what the magazines are going to do then, I'm sure I don't know."

THE latest discovery in America is a boy with such peculiar vision that he can see through substances in the same way as the Röntgen rays. His name is given as Alvey Leonel Brett, of South Braintree, Mass. The boy is said to have diagnosed a number of fractures. In confirming the diagnosis of a broken hip, he pointed out that the fracture was nearer the head of the bone than had been thought by the physicians. He examined a child who, it was supposed, had swallowed a coin, and declared there was no coin there. This was proved to be correct at the post-mortem, the child having died from other causes. The lad also used this power by so concentrating the sight as to shut out ordinary daylight. The air, he says, is then filled with flashes of a pale greenish light, which illuminates the object to be examined. This light, he says, is the same as the X ray in the Crookes tube. Daylight is then darkness, or a reddish black.

THE SANDELL "PERFECT" COMPETITION.—The July awards in this competition were as follows:—10l. prize, three studies—*The Blacksmith*, *The Blacksmith's Shop*, *The Village Smithy*. Mr. Arthur Waterall, Flixton, Lancashire; 5l. prize, *Does he come?* Mr. C. F. Inston, Liverpool; 1l. prizes, *A Shadow on the Path*, Miss Agnes B. Warburg, London; three studies—*Reaper of the Sea*, *Outboard Bound*, *Evening*, Mr. William Norrie, Fraserburgh, N.B.; *Lilies*, Miss Simmonds, Bromley, Kent; *Cloisters*, Gloucester Cathedral, Mr. H. C. Leat, Bristol; *Interior of St. Mary's Church*, Balham, Mr. A. E. Walsham, Balham; three studies—*Off to the West*, *After Sunset*, *Before the Storm*, Mr. G. H. Gidman, Liverpool; *Knights of the Glen*, Mr. R. Stockdale, Leeds; *Two Interiors with Figure*, Mr. C. S. Tyler, Earls Colne, Essex; two studies—*Young Cuckoo in Meadow*, *Pipit's Nest*, *Homeward Bound*, Mr. G. Graham, Girvan, N.B.; *Household Duties*, Mr. T. Knox, Belfast.

VALUE OF THE SUN'S RAYS.—Professor Sinclair says that many know by experience that the relief afforded by the sun's rays to wearing pain, neuralgic and inflammatory, is more effective and lasting than that of any application whatever. Those who have face-ache should prove it for themselves, sitting in a sunny window, where the warmth falls full on the cheek. For nervous debility and insomnia, the treatment of all others is rest in sunshine. There is no tonic like it, provided the good effects are not neutralised by ill-feeding. To restore a withered arm, a palsied rheumatic limb, or to bring a case of nervous prostration up speedily, a most efficient part of the treatment would be to expose the limb or the person as many hours to direct sunlight as the day would afford. With weak lungs, let the sun fall full on the chest for hours. For the chilliness which causes blue hands and bad colour, resort to the sun; let it almost blister the skin, and the circulation will answer the attraction. It is a finer stimulus than wine, electricity, or massage, and we are on the verge of great therapeutic discoveries concerning it.

THE KODAK WORKS.—The works of Kodak, Limited, at Harrow, were on Saturday afternoon last on the occasion of the visit of the London staff. The visitors, numbering about 150, arrived at Harrow station about three p.m., where they were met by the heads of the factory departments, and conducted over the works in groups. The inspection of all the various departments occupied over two hours, the various processes being minutely explained by the guides, selected from the technical staff. Shortly after the factory closed, the combined staff, numbering over 500, were photographed in one group, and then sat down to tea in a marquee erected in the grounds. After tea, various friendly games and contests were fought out between the Harrow and London staffs. The lawn tennis courts were freely used, and

dancing on the lawns continued until 8.30. The band of the 5th Middlesex Volunteers (by kind permission of Major Harris) furnished the music during the afternoon and evening. The complete success which characterised this friendly gathering of the whole English staff will no doubt lead the directorate of Kodak, Limited, to repeat the experiment at an early date.

WE regret to record the death, under exceptionally sad circumstances, of Mr. J. R. Bourne, an assistant in the employ of Mr. Busbridge, of Blackbeath, who speaks most highly of his abilities and punctuality. Mr. Bourne left business on Saturday evening, August 5, to spend the August holiday at his home in Folkestone, returning to business on Wednesday morning, August 9, in his usual health, and expressing himself as having had an exceptionally enjoyable holiday. He went about his work without showing the least sign of anything amiss until about four o'clock in the afternoon he complained of faintness, which passed away shortly, and he continued work for a while, when the faintness returning necessitated his removal to his apartments, where he passed peacefully away at eleven o'clock the same evening, through apoplexy. His relations were summoned by telegram, but were unable to reach London in time to see the last. Mr. Bourne had endeared himself to many by his thoroughness and kindly disposition, and his loss will be deeply felt. He had previously been in the employ of Messrs. Wing, of Tunbridge Wells; Lord, of Cambridge; and Coles, of Watford.

SUNDAY TRADING.—John Hawkey, Humber-street, Cleethorpes, pleaded not guilty, at the Grimsby Police Court, to pursuing his business as a photographer on the Lord's Day, on August 6, on the Promenade at Cleethorpes. Police-constable Page said that defendant was giving out circulars to passers-by and offering to take their portraits. Defendant said that Sunday was the best day for photographers, and why could they not take photographs in Cleethorpes on a Sunday the same as in other places? The public could not object to it, or why did they take more photographs on Sundays than on two or three days in the week put together? He had been seven years in Blackpool, and never knew what it was to have a Sunday off there. It was as necessary to take portraits on a Sunday as it was to sell tobacco, yet tobaccoists could open on a Sunday. In reply to the Chairman, defendant said he was fined for a similar offence a month ago; but, he added, he was not before the Court out of any spirit of defiance of the law, but to explain to the Bench that he simply exposed the plates on a Sunday and did not finish the photographs. The Chairman said it was trafficking, and defendant would be fined 5s. and costs, 4s. 6d.—Defendant: What if I refuse to pay the money?—The Magistrate's Clerk (Mr. T. Mountain): You will find out.—Defendant paid the money.

A NEW METHOD OF TEACHING DRAWING.—The new methods of art and manual training devised by Mr. J. Liberty Tadd, Director of the Public School of Industrial Art, Philadelphia, formed the subject of an interesting lecture which was given recently by Mr. H. Bloomfield Bare, F.R.I.B.A., in the Lecture Theatre of the College of Art, South Kensington. The most striking point about this training is its ambidextrous character, the child being taught to use both hands alike. The pupil learns first to draw on the blackboard simple curves, circles, and other freehand figures, and goes on with original design and creative drawing, and then to modelling in clay and carving in wood. Mr. Bloomfield Bare's lecture was devoted to a full explanation of the system of blackboard drawing. He had studied Mr. Tadd's system during a five-years' residence in Philadelphia. In drawing on a large scale on the blackboard, the child was taught to exercise its muscles; there was no niggling work, but a free clear stroke was acquired. By the bi-manual training a perfect and equal development of the muscles was obtained. As a practical illustration of what can be accomplished in this way, Mr. Bare's daughter then drew a number of figures and designs upon the blackboard, some being of a very elaborate character, using her left hand for that part of the design that was on the left side quite as easily as her right, and drawing curves and circles on a large scale with wonderful steadiness and accuracy by a single movement of the hand. A number of lantern slides were exhibited, showing photographs of classes of children actually engaged in blackboard drawing.

THE late Professor Bunsen, one of the greatest chemists of his time, was of the same peasant-farmer stock settled in Waldeck which, by a different branch, produced Baron Bunsen, the scholar and diplomatist. His father was a professor of Occidental literature in the Hanoverian University of Göttingen, where he was born in 1811, about two years before Bismarck. Soon after taking his degree he succeeded Wöhler as teacher of chemistry at the Polytechnic Institute of Cassel in 1833, whence in 1838 he was appointed to Marburg as assistant professor of the same science, attaining to the chair thereof in 1841. Ten years later he was called to Breslau, and the following year, 1851, to Heidelberg, on the University of which Bunsen was to shed a new lustre by his brilliant discoveries in the field of practical science. In conjunction with Professor Kirchhoff, of Berlin, Bunsen may be said to have been the founder of stellar chemistry, and his numerous discoveries, from the spectrum analysis down to the simplest manipulations of practical chemistry, soon procured for him a world-wide reputation. Some of our own most distinguished scientists studied under him at Marburg or Heidelberg. Foreign honours rained in on him, and in 1883 he was appointed one of the eight foreign associates of the Paris Academy of Science. Among his numerous discoveries was an antidote to arsenic, and the galvanic battery and photometer which bear his name. His scientific writings would require a catalogue all to themselves. The simplest and most genial of men in private life, Bunsen has left a host of European pupils who will mourn his loss as one of the greatest scientific discoverers and teachers of his time.

THE following is the list of awards of the Warwick Monthly Competition for August:—10l. prize, *Nap*, Mr. A. Coupe, photographer, 43, Wilmstow-road, Manchester; 5l. prize, *Child eating Strawberries*, Mr. S. Lambert Weston, photographer, 23, Sandgate-road, Folkestone; 1l. prizes, *Study of a Rose*, Miss Ellen Blakeley, 5, Weld-road, Birkdale, Southport; *Two Sisters*, Mr. E. W. Bradden, 14, North-street, Guildford; *Child Laughing in the Window*, Mrs.



Josephine E. Cordiner, Naruton Lodge, Great Malvern; *Interior of Tintern Abbey*, Mr. R. W. Dugdale, 25, Kingsholm-road, Gloucester; *Bubwith Church Tower from the West*, Dr. G. A. Farrer, Brighouse, Yorks; *The Last Load*, Mr. J. Willis Grundy, 22, Steven-street, Stretford; *Companions*, Mrs. Holmes, photographer, 4, Park-street, Lytham; *Herd of Jerseys*, Mr. A. E. Horne, Raa, Magistrate, Queenstown, Ireland; *Portrait Figure Study*, Mr. W. G. Jameison, Cults, Aberdeenshire; *The Coast of Sark*, Captain H. G. Kennard, La Casita, Dinard, France; *A Willing Model*, Mr. A. B. Knight, High-street, Knighton, Radnorshire; *The Graveyard in Navvies Prison*, Mr. V. Levi, 20, Princes-square, London, W.; *A Little Girl Knitting*, Mr. J. Peat Millar, Braehead, Beith, Ayrshire; *The Finishing Touches*, Mr. W. Northwood, Wordsley, Stourbridge; *Cadder Water, Duntocher*, Mr. Isaac G. Paterson, Postal Telegraphs, Glasgow; *Orford in Kent*, Mr. Karl Rauch, 41, Chapel-road, West Norwood, S.E.; *Neath the Shade of Ancient Trees*, Mr. A. R. Read, jun., Rothsay, Clifder-road, Brentford; *After the Cycle Parade*, Mr. David Reid, Brighton-avenue, Woodsend-road, Flixton; *An Avoikward Encounter*, Miss Ella Tomlinson, Kensington-cottage, Fishbourne, Chichester; *Children at Lessons*, Mr. C. S. Tyler, High-street, Earls Colne, Essex.

**SECCO FILMS (LIMITED).**—As will be seen by an announcement in our outer pages, Secco Films (British and Colonial) (Limited) has been formed, with a capital of 100,000*l.*, in 1*l.* shares, to acquire the invention of Herr Oswald Moh, of Görlitz, Germany, for improvements in and connected with photographic films (known as Secco films), with the right to apply for and obtain colonial patents and rights for the invention, and to carry on the business of manufacturers and dealers in photographic apparatus and materials. The purchase price has been fixed at 80,000*l.*, payable 30,000*l.* in cash and 16,667*l.* in cash or shares, and the balance in shares. The present issue is of 66,667 shares, of which 20,000 shares will be appropriated to provide working capital, and for the purchase and erection of plant. The list closes on Saturday.

## Patent News.

THE following applications for Patents were made between August 8 and August 12, 1899:—

**PHOTO-ETCHING.**—No. 16,137. "Improvements in the Art of Making Half-tone Plates." J. GIESSECKE.

**PRINTING.**—No. 16,292. "A New or Improved Photographic Printing Process." G. T. HOLLOWAY.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
29.....	Birmingham Photo. Society .....	Demonstration: Messrs. Wellington & Ward's New Negative Film. Harry Wade.
29.....	Hackney .....	Stereoscopic Work. A. D. Fort.
30.....	Kingston-on-Thames .....	Excursion: Windsor. Leader, A. Van-dendriesche.
30.....	Photographic Club .....	Open Meeting.
30.....	West Surrey .....	Affiliation Lecture: Lantern - slide Making. J. A. Hodges, F.R.P.S.
September.		
1.....	Manchester Amateur .....	Carbon Printing. J. H. Evans.
2.....	Borough Polytechnic .....	Excursion: Theydon Bois and Roding Valley. Leader, P. C. Cornford.
2.....	Hackney .....	Excursion: Benfleet and Canvey Island. Leader, J. J. Westcott.
2.....	Manchester Amateur .....	Excursion: Hoylake. Leader, S. L. Coulthurst.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 10.—Mr. T. E. Freshwater in the chair.

The CHAIRMAN gave an anecdotal account of some of the pictures he might have made of bathing scenes at Overstrand, Norfolk, where he had spent his holiday, if he had not left his hand camera at home. From his account the subjects appeared to be much over-exposed.

Mr. Rapson passed round two negatives, which had been exposed in a hand camera. Almost in the centre of each appeared a circular spot, about the size of a shilling, where the negative seemed normal, the other part, including that protected by the rabbit of the plate sheaths, was fogged. Of two dozen plates, exposed under exactly the same circumstances, these two negatives were the only ones showing any defect.

Mr. P. EVERITT suggested as a possible explanation that the two plates had been left at some time in an unsafe light with some circular objects upon them.

The CHAIRMAN, referring to the photographs exhibited for sale at the seaside places he had recently visited, said that those produced in colour, such as those of the photochrome, Zurich, seemed to have quite supplanted the ordinary photographic views.

Mr. RAPSON said he was not surprised at that, if, elsewhere, the local

photographers produced nothing better than the photographs he had seen on sale at Southend and the neighbourhood. These he characterised as being atrocious, both technically and artistically.

Mr. A. MACKIE asked the reason that, with all the new developers, a large amount of sulphite of soda was included in the formula when it seemed not to be requisite? He instanced a recent experience, using a solution of ortol, with half the weight of metabisulphite of potass as a preservative, and a plain solution of carbonate of potass, he had obtained negatives which might be practically described as black.

A long, but quite unreportable, discussion then took place upon the colours of deposit in negatives and development stain, and the effect of a black-and-white and a coloured negative upon the print.

AUGUST 17.—Mr. T. E. Freshwater in the chair.

Mr. W. D. WELFORD mentioned that he had recently been troubled with markings on the films of negatives that had been soaked in an alum bath before fixing.

It was suggested that some of the alum might have remained in the film, and had decomposed the hypo of the fixing bath.

Mr. WELFORD said that this could not have been the case, for the markings were visible before immersion in the fixing bath.

Mr. S. H. FRY, in a discussion which took place on stained negatives, said it was quite a common thing in the course of his business, to have an order to remove stains and other defects from negatives. Recently, his operator having failed to rectify by ordinary means three negatives which had apparently been insufficiently fixed, he had spent two to three hours experimenting with them, but with hardly any result. The difficulty was that, though the negatives after his treatment appeared in fairly good condition, upon drying the shadows became quite opalescent. Mr. Fry also referred to a difficulty in making paper negatives of large size, owing to the tenderness of the paper support. It was impossible to hold up the negatives while wet in the usual way by the corners, as the weight of the sheet was too great.

The CHAIRMAN, referring to some negatives shown at the previous meeting by Mr. Ropson, which showed a circular patch of comparative unsensitiveness about the centre, said the defect had been traced to a piece of leather at the bottom of the camera, placed there to cover the hole where the tripod screw was inserted.

Mr. A. MACKIE said he had tried that day the addition of sulphite of soda to the sulphocyanide mercury bath for the first time. His experiment was with matt P.O.P. He had removed the prints from the toning when quite warm in the shadows by reflected light, and at a stage when, with the ordinary sulphocyanide bath, the shadows would be quite red in the finished print. His finished results were less warm than when they left the toning bath, and there was no appearance of double toning.

Referring to toning bromide prints with alum and hypo, a member said he had never succeeded until he had adopted the method of proceeding in a directly contrary way to the usual instruction. He used a freshly mixed bath; and not a matured one. He found the toning action began when the bath reached a temperature of 115°. He found it unnecessary to raise the temperature much over 120°. To obtain a successful result, it was necessary to have a print not too heavy in the shadows, or it was impossible to carry the toning action far enough. A strong print was, however, wanted.

### PHOTOGRAPHIC CLUB.

AUGUST 16.—Mr. H. Snowden Ward in the chair.

Mr. Wallis showed prints from negatives taken during his recent holiday upon what he concluded were stale plates, which showed great numbers of mottled marks and also halation round objects.

The subject for discussion for the evening,

#### THE PERMANENCY OF THE BROMIDE PROCESS,

was gone into at great length.

Mr. BRIDGE was of opinion that, with ordinary care, the process was quite permanent. He had, in the course of his business, made and developed large numbers of prints, and even in those instances where time was important, and he had only been able to give a very short and rapid washing, often, after lapse of long periods, he had found them without deterioration. Too many photographers were in the habit of trying every and any kind of paper, instead of sticking to one and completely mastering it; moreover, most of them were entirely unaware that the latitude in working with ferrous oxalate was as great as any could desire.

Mr. J. BROWN thought that many gave up ferrous-oxalate development because of their many doubtful results, due to not thoroughly clearing their prints in the acid bath, and consequently took to using the new developer, which left nothing behind likely to attack the silver image.

Mr. MACKIE considered that the ability to obtain good results by the new developers, and at the same time to get rid of one process, and that most calculated to introduce doubt, was most important.

Mr. WALTER D. WELFORD was also of opinion that bromide prints, developed in the usual way with any developer, were decidedly permanent, but he could not say the same of toned, i.e., "boiled," prints, which he considered not only uncontrollable in toning action, but in no sense permanent; in fact, he had experienced decided deterioration in two months.

Mr. J. BROWN quite disagreed with Mr. Welford as to the "boiled" prints not being permanent. He had made many such, and, so far as he understood the process, the resulting picture consisted of silver sulphide, and stood tests well, and it was in his hands quite permanent. It was, though, useless to expect good results with new hypo-alum solution; the older the better. He had also tried the various substitution toning processes successfully, and, working them solely for his own amusement—perhaps, owing to his taking every care—they had so far proved permanent; they were, however, for the most part, protected from the air.

Mr. BRIDGE thought that the application of heat evenly had much to do with ease and evenness of toning, and suggested a double dish as likely to produce that result.



Mr. G. A. BROWNE said he had toned prints and lantern slides with uranium, and found them permanent, but thought it most essential that the toning should be full.

Mr. J. BROWN did not consider uranium toning otherwise than doubtful, perfect washing and absolute evenness of action being so essential.

Mr. H. P. SMITH asked if one portion of the deterioration was not traceable to the paper used, particularly that used for negative paper; for, apart from the friable nature not allowing large sizes to be handled, there seemed to be great variation of quality and condition, and he mentioned some qualities of papers as not being liable to this defect.

### FORTHCOMING EXHIBITIONS.

1899.

- Sept. 22-Nov. 4 ..... Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.
- „ 25-Nov. 11..... Royal Photographic Society. Hon. Secretary, Colonel J. Waterhouse, 12, Hanover-square, W.
- October 18-24 ..... Croydon Camera Club. Hon. Secretary, W. H. Rogers, 106, Holmesdale-road, South Norwood.
- „ 22-Nov. 19... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.
- Nov. 27-Dec. 18 ..... American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.
- December 7-9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

### Correspondence.

\*\*\* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\*\*\* We do not undertake responsibility for the opinions expressed by our correspondents.

#### THE CAMERA OBSCURA AND THE CAMERA CLUB EXHIBITION.

To the Editors.

GENTLEMEN,—Permit me to thank you for drawing my attention to some remarks, which I might otherwise not have noticed, appearing in the *Journal of the Camera Club*, which reflect upon my critique of the Camera Club Exhibition, printed in the first number of the *Camera Obscura*.

The editor of the former journal is quite right in resenting, on behalf of the members of his Club, any unvarnished personal impression which is not all adulation; indeed, he has a good deal of reason to expect either a respectful silence or an unqualified approval for the Exhibition.

These are, however, not sufficient reasons for saddling me with the consequences of the Club's shortcomings in failing to provide visitors with a catalogue of the Exhibition.

When I attended to inspect the collection, about a week after the opening, no catalogue was to be had. Hence those little clerical errors, which have been so skilfully "enlarged" and adroitly "retouched," although, after all, not corrected.

Under these circumstances, it is matter for surprise that much more error did not creep into the report than, to judge by the somewhat obscurely worded paragraph in the *Journal of the Camera Club*, a wrong number and an obvious *lapsus calami* in calling a print (entitled *A Midsummer Day*) *May-time*.

Let me add, that the mistakes were so few is largely due to the kindness and courtesy of Mr. Craigie, who, during great part of my stay at the Exhibition, was unremitting in his endeavours to supply the information for which one usually and preferably consults a catalogue.—I am, yours, &c.,

HECTOR MACLEAN.

#### VALUE OF ENGRAVINGS.

To the Editors.

GENTLEMEN,—Replying to your correspondent, "Colonel," the coloured engravings he refers to are not rare, but they are to be found in various degrees of excellence. Their value depends entirely upon how excellent they are. I am quite sure that Messrs. Sotheby & Co., of 18, Wellington-street, Strand, would be able and willing to say how much they are worth, i.e., how much they would fetch if sold at one of their auction sales.—I am, yours, &c.,

AJAX.

### Answers to Correspondents.

\*\*\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\*\*\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\*\*\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

#### PHOTOGRAPHS REGISTERED:—

S. R. Berry, 10, St. Peter's Paved-row, E., Great Yarmouth.—Photograph of dungeons at Tolhuise, Great Yarmouth.

J. W. Cruickshank, Combe Head, Haslemere.—Photograph of portion of south-west corner of San Michele, Lucca, Italy. Photograph of wheel window at San Zeno, Verona, Italy. Photograph of western facade of San Zeno, Verona, Italy. Photograph of western facade of San Michele, Lucca, Italy.

PNEUMATIC.—We believe the originator was either Mr. James Cadett or Mr. B. J. Edwards.

AN AMATEUR.—We are much obliged to you for your letter, but our correspondence columns are not the place for advertisements.

SWAN'S PATENT FOR CARBON TISSUE.—CARBONENSIS asks the date of Swan's patent, and if it is still in force? The patent was taken out early in the year 1864, consequently it expired many years ago.

PRINTS STICKING TO GLASS.—H. JENKINS. The reason why the "enamelled" prints leave some of the collodion on the glass, when they are stripped off, is that the plates were not properly waxed or French chalked. More care in this is the remedy. The collodion is in no way at fault.

LENS QUERY.—T. COLES. Get an ordinary R.R. A wide-angle lens, covering the same size plate, would be more convenient occasionally, but that convenience is more than counterbalanced by its inconveniences for general work. Not the least of these is its much smaller aperture, and consequent slowness.

STAINED NEGATIVES.—A. B. C. The negative arrived smashed to atoms, as well might be expected to be the case with one sent through the post simply protected by carls. So far as we can see by the fragments, the stains are simply due to imperfect fixation. Bromide paper will not do for printing out upon.

BELLOWS STICKING.—T. A. JEWELL complains that the gussets of the bellows of his camera stick together if it has been folded up for some time, and asks for a remedy.—The best thing we can suggest is, rub the bellows well over with French chalk, rubbing it well into the material, and then lightly dusting off the surplus.

MATT VARNISH.—ALF. KNOWLES asks if the "matt varnish, the formula for which is given in the ALMANAC, is applied to the glass while it is cold, or should the plate be heated? Also whether the varnish should be dried off before the fire, like ordinary negative varnish?—The varnish should be applied cold and dried without heat.

COPYRIGHT.—F. J. A. Although you purchased the copyright negatives with the business, you have no copyright in them, unless the copyright in them was separately assigned to you and the assignment duly registered at Stationers' Hall. As it is, the copyright is still vested in the one who took the photograph, and it is he only who can take proceedings for its infringement.

FELLOWSHIP OF THE ROYAL PHOTOGRAPHIC SOCIETY.—AMBITION writes: "Would you kindly inform me what qualifications are required to become a Fellow of the Royal Photographic Society? How is one to go to work to obtain that name?"—Your better plan will be to address the Secretary, Royal Photographic Society, 66, Russell-square, W.C., for particulars.

RE-CEMENTING LENS.—R. DAVIDSON says: "The back lens of my rapid rectilinear is coming uncemented. Can you tell me if I, who have never attempted such a thing, could succeed in repairing it, and, if so, where I could get a suitable Canada balsam cement?"—We should recommend you to send the combination to an optician, preferably to the maker of the lens, who will do the work for a trifling sum. Doubtless the glasses are burnished in the cell, and you might injure them in getting them out or in putting them back. Canada balsam may be obtained from any of the optical and philosophical instrument makers.

REMOVING STAINS FROM FINGER-NAILS.—M. W. says: "Can you oblige me by informing me what I can use to remove a pale brown stain from the nails? I am a printer, toning a considerable batch of P.O.P. prints in the usual sulphocyanide bath daily, and suppose the bath causes the stain."—The stain is caused by the free silver in the washing waters, and it is somewhat difficult of removal. A strong solution of cyanide of potassium is sometimes used, but it is dangerous on account of its poisonous nature. A solution of iodine, followed by one of hyposulphite of soda, may also be used. The stain, if not very deep, may be removed mechanically with fine pumice powder moistened with water.

\*\*\* We are unavoidably compelled to hold over a large number of answers to correspondents and other communications. All arrears shall be overtaken next week.



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## THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1900.

Edited by THOMAS BEDDING, F.R.P.S.

THE thirty-ninth annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1 next. Its preparation is already receiving attention. This year's ALMANAC reached a total of 1508 pages, and the entire edition of 20,500 copies was sold out within about three months of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past ALMANACS have been received is the surest proof that the lines upon which that publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1900. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the ALMANAC in directions which may occur to our readers as susceptible of improvement.

The ALMANAC for 1900 will appeal to photographers all the world over as a daily reference guide in practical work. The

formulae will be revised where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages of the 1900 ALMANAC. Those of our friends intending to co-operate with us in this respect will oblige us by letting us have their MS., sketches, &c., at the earliest possible date.

Secretaries of societies will also oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us as early as possible.

The publishers ask us to remind advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

## EX CATHEDRÂ.

It is so seldom that we read a commendatory note on professional portrait photography in the great London daily papers that the following criticism in the London *Daily Chronicle* will, doubtless, prove of interest to many of our readers. “The latest photograph of the Queen,” says our contemporary, “is one that all loyal subjects will like to possess, and the first remark upon it must be that Her Majesty does not look her great age. Not long ago the *Spectator* told us that the secret of the Queen's strength as a ruler was to be found in her ‘equable temperament,’ and, looking at the present photograph, one cannot help agreeing in this verdict. Dressed quietly in black, and with a fan lightly resting in her hands, her Majesty's expression is calm, radiant, benignant. Another equally interesting photograph shows the four generations. The Queen, who wears a hat with large white feathers, is seated, and her left arm encircles little Prince Edward, who is in a sailor suit, while on her Majesty's left and right stand the



Prince of Wales and the Duke of York. The photographs were taken at Osborne exactly four weeks ago by Messrs. Chancellor, of Dublin. We have seldom seen examples of the photographic art more charming than these."

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THE Assistant Secretary of the Royal Photographic Society writes us: "May I ask you to be kind enough to remind your readers that all entries for the Forty-fourth Annual Exhibition, to be held at the Gallery of the Royal Society of Painters in Water Colours from September 25 to November 11, close on Wednesday, September 6, at 9 p.m. Exhibits in packing-cases must be delivered at 66, Russell-square on or before September 5."

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IN connexion with the foregoing letter it is of historical interest to note that the next Exhibition of the Royal Photographic Society, which opens a little more than three weeks hence is, in all human probability, the last that will be held in the Galleries at Pall Mall East. Next year the Society will have possession of the New Gallery, Regent-street, for the purpose of its annual display, and the present intention is to make that display not only much larger than it is now, but also considerably more comprehensive. To every branch of photography it is anticipated that the Society, with the space then at its disposal, which it does not now possess, will be able to do an amount of justice which it is not at present in its power to dispense. The pictorial, technical, scientific, manufacturing, and other photographic interests will then, it may be conjectured, be adequately represented for the first time at an annual London Photographic Exhibition.

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CHANCE, or good fortune, has given us the opportunity of seeing a large proportion of the work that is to be sent in next week to the Selecting Committee, and, taking the line by what we have seen, and assuming the majority of the photographs we have examined to be accepted, we have no hesitation in saying that the old Society will show the world a collection of work which will more than justify its original claim to have sprung into existence for the "advancement of photography." In the space of forty-six years the Royal Photographic Society, as it is now called, has, with very few breaks, provided the opportunity for an annual exposition of an ever-advancing, if an ever-changing, manifestation of the wonderful effects and phenomena which it is the province alone of photography to suggest or record, and this month's Exhibition, we are sure, will witness something like an apotheosis of its efforts to attract to its walls, year by year, all that is truly representative of the passing phases of photographic expression.

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OUR own personal experiences of the Photographic Society's Exhibition date back the comparatively short space of twenty years. Brief though that time may be, "many things," as the late Lord Beaconsfield once said, "have happened since then." A wonderful change has come over the appearance of the famous Exhibition. The silver print, with its wide margin and Oxford mount, is rarely seen now in Pall Mall East. In the interim "close-up" framing has come into vogue. Platinum, with its variety of colourific deposit, has sternly challenged gelatine-pigment printing for pride of place. Bromide, toned and un-

toned; collodio-chloride; gelatino-chloride; the short-lived Artigue and gum-bichromate processes, all these and others have been illustrated in the annual Exhibitions at Pall Mall. "Times change and we with them," and so it may be truly said of photographic fashions. What pleases us to-day fails to attract our favourable notice to-morrow. We well recollect one Exhibition which, as if in protest against the previous predominance of albumen prints, was simply a manifestation of bromide and platinum blacks all through. We should not be surprised if this year a similar phenomenon were not witnessed, viz., a revival of rich blacks and the relegation to disfavour of warm tones and muddy browns.

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THIS year's Exhibition will be notable in another respect. For the first time special pains have been taken to choose a large and representative Committee of Selection, the one half of which was deputed to act in the interests of pictorial exhibitors, the other in those of contributors to the Technical Section. This joint committee—or two committees—were given full powers of selection. They are independent of the Judges; their selecting work is to be done before the Judges appear on the scene. In appointing these committees it was apparent to those familiar with the matter that there was no doubt of the intention of the Council of the R.P.S. to dissociate entirely the office of selection from that of judging. In view of this fact, recent complaints that the Judges are denied the opportunity of selecting the photographs upon which they are to be called upon to adjudicate are shown to be futile and absurd. It requires very little effort to show up the unreasonableness of a Judge's claim to select as well as to judge an exhibition. A few years ago a gentleman connected with the Photographic Salon told us that in his opinion not more than two or three at most of the exhibits at a Pall Mall Exhibition were "worthy" of being shown at the Salon! It is this impertinence of idea which underlies the demand for turning the R.P.S. Judges into a committee of selection, and we hope the Society's executive will not give the smallest encouragement to such pretensions.

\* \* \*

SOME idea of the hold which stereoscopic photography is obtaining upon the general public is afforded by the fact that last month Messrs. Underwood & Underwood, the largest producers of stereoscopic photographs in the world, made a sale of upwards of 6,000,000 paper slides, the greatest monthly output the firm has yet reached. Messrs. Underwood's plan of working is to form sets of slides illustrative of different countries, and these are sent out in cabinet form, accompanied by suitable stereoscopes and descriptive notes. They anticipate that their operators will be taking negatives in India, Australia, Africa, and elsewhere for the next four years continuously. It is the endeavour of the firm to secure the recognition of stereoscopic photographs as a valuable educational agency by the American scholastic authorities, and to this end they propose putting on the market a multiple stereoscope which will allow of the examination of binocular photographs by several persons simultaneously. The progress in popularity of stereoscopic photographs among the general public will, no doubt, have the effect of stimulating amateur photographers to take up this branch of work.

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WRITING on the subject of colour photography in our ALMANAC for 1899, we made a suggestion that somebody with



the requisite knowledge and ability should prepare a book fully detailing all that has been attempted or achieved in the production of photographs in colour. Such a book, we remarked, would be of immense value, not only for reference but also to those disposed to make experiments in colour work. We are pleased to learn that our idea is likely to receive at least partial realisation. Mr. E. Sanger Shepherd, than whom perhaps there is no higher authority in England on the subject of three-colour photography, informs us that he has in preparation a volume dealing exhaustively with the subject from three standpoints: the historical, the theoretical, and the practical. Mr. Shepherd has for years devoted himself to a close study of many branches of colour photography, and the unequalled knowledge he has thus acquired should make his work on the subject he has in hand of the very highest value.

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WITHOUT comment or details of any kind, our contemporary, the *Photo Beacon*, prints in its August number a half-tone reproduction from a negative made with the Panoramic Kodak. To the best of our recollection, this is the first example we have seen of the new kind of panoramic photography. The picture, whether reduced or not we cannot say, measures seven inches by two inches, and obviously includes a considerable angle of view. For very many subjects panoramic photography is peculiarly adapted, and we have no doubt that, when the Panoramic Kodak reaches the English market, the nature and dimensions of the picture it gives will make this kind of photography popular with a great many.

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DURING his recent visit to London we had the opportunity of conversing at length with our *confrère*, Mr. F. Dundas Todd, editor of the Chicago *Photo Beacon*, on the condition of matters photographic in the United States. Mr. Todd's future plans include the publication of many elementary text-books on photography, for which he tells us there is a great demand amongst American amateurs. This class of photographer likes his subject presented to him in the tersest language, and to be told how to work in the simplest and most direct manner. English text-books are written to suit a different class, with whom elaboration of language and theoretical and practical ideas are taken as a matter of course. It is perhaps for this reason that English books on photography have not, as a rule, the greatest vogue in the States.

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MR. TODD, who has been absent from Britain seven years, confessed to us that, judging by what he has seen during the last two or three months, the condition of British professional photography compares unfavourably with that of the American. The American professional is smart and alert in his business methods; he is quick to seize and introduce novelties to his sitters, and his relations with the latter differ vitally from the relations usually existing between the British photographer and his client. The better class of American professional man is not afraid to assert his independence by insisting that he knows best what suits a sitter, in the way of pose, lighting, size of picture, and so forth. In fact, he takes up a professional standpoint instead of a commercial one, that is to say, the choice of style or treatment rests with him, and not with the sitter. We have heard one of our foremost British photographers say that the great thing lacking in his *confrères* is

this very independence, which Mr. Dundas Todd describes to us as animating some of the most successful professionals in the United States.

\* \* \*

WE have received from Messrs. Kodak, Limited, a copy of the prospectus of the General Aristo Company, which has just been brought out in the United States. The capital is five million dollars, and the shares offered for public subscription were subscribed, we are informed, 'three times over. Mr. George Eastman is President of the Company, which has been formed to purchase the photographic printing paper businesses of the Eastman Kodak Co., the American Aristotype Co., the Nepera Chemical Co., the New Jersey Aristotype Co., the Photo Materials Co., and Kirkland's Lithium paper. By this combination the control of the manufacture of about 90 per cent. of American photographic printing paper has been centralised.

\* \* \*

IN our LANTERN SUPPLEMENT this month we print from the *Philosophical Magazine* for August an abstract of a paper by Professor R. W. Wood on "The Photography of Sound Waves." Two plates of collotype pictures of sound waves are given in the *Philosophical Magazine*, to which we must refer the reader for the explanatory parts of Professor Wood's paper, as we should have experienced considerable difficulty in doing justice to the original illustrations if we reproduced them. It may be mentioned that Professor Wood is the author of the ingenious method of colour photography by means of diffraction gratings, described in these columns some months ago.

#### REDUCTION AND INTENSIFICATION IN PROFESSIONAL WORK.

IN establishments where a large amount of work is turned out no process for any purpose has a chance of success if it involve tedious operations and delay of execution. "It is all very well," recently said a professional to us, "for an amateur whose photography is only a cherished hobby, but for bread-and-butter work we want a good process, and, if possible, a quick one all through." And, as regards the particular operations we are now discussing, it is the aim of the professional to take negatives where they shall not be needed; but the best of men fail at times, and have to invoke the aid of one or the other of these two necessary but distasteful operations.

We have made a number of inquiries on the subject; and, taking intensification first, we may say the general favourite is one or other form of mercury intensifier. Our own experiments lead us to the conclusion that it is the simplest, safest, and easiest, and, with care, absolutely permanent. The plan in use over forty years ago with wet collodion is still in vogue, and cannot be improved upon—a solution of bichloride of mercury, in which the plate is immersed till white all through, followed, after a good washing, by treatment with ammonia, ammonia hydrosulphide, or other similarly acting chemical. It does not seem to matter much which is employed. We all know the usual objection, that the process is not under control; that, if a negative only needs slightly increasing in density, the mercury process will carry it to such excess as to make it almost useless. These objections are entirely futile. There is no process in the whole range of photography in which results are more under control (we, of set purpose in this connexion, ignore all reference to scale of gradations; we merely refer to



bringing the negative to a density sufficient to give a good print). When the intensification is complete, it can be reduced to any extent required by simple immersion in a weak solution of hypo. What more in the shape of control could be required than a process which will give any depth between the original feeble density and a density almost to opacity? We have had in our hands negatives so treated that showed no signs of alteration after a dozen years' storage, but they were all varnished. We have great faith, too, in the Edwards's intensifier, as modified by Mr. Watmough Webster, who keeps a bottle of red iodide of mercury, made by precipitation, and kept stored in a thin paste, no attempt to dry it being made. When required for use, a five per cent. solution of hypo is taken, and, after well shaking the iodide bottle, the red "cream" is slowly dropped into the hypo till no more will dissolve and a small quantity is left undissolved. When this is applied to the negative, it takes density most beautifully. It should be allowed to give a slight excess of depth, and then reduced by immersion for a short time in weak hypo. This has the effect, while reducing the excess of depth, of conferring brilliancy, and it seems to prevent the negative fading in after-years, otherwise the shadows are apt to become yellowed after the lapse of time, and the beautiful colour of the negative generally reduced to an unpleasant yellow or sepia.

For reduction there is no doubt that the universal favourite is the Howard Farmer reducer. A stock solution of twenty per cent. ferricyanide of potassium is kept on the shelves, and, when reduction is needed, it is only necessary to add a drachm of this liquid to two ounces of the ordinary dark-room hypo to obtain a liquid that acts most efficiently. If used very slightly, it confers brilliancy by clearing the shadows, though it must be admitted that, if any considerable reduction is needed, the lighter tones disappear entirely. Its use, therefore, is contra-indicated in the case of negatives which err, if at all, on the side of under-exposure. Here the excellences of the new agent, persulphate of ammonia, become conspicuous: it does not eat away the light tones at the expense of the quality of the plate, and does essentially, whatever the cause may be, act more upon the strong high lights than the slighter deposits of the image. There is no doubt, too, that, until properly understood, stains and spots may be produced under its use. Thus, if a plate so reduced be placed under a rose jet of water, an iridescent spot appears under each little stream of water; but, if after the slightest amount of washing such a plate be put in a ten per cent. solution of sulphite of soda, the iridescence instantly disappears, and it may then be again slightly washed, and finally put in a bath of ten per cent. hypo, or, indeed, the ordinary hypo fixing bath of the dark room not diluted at all. The plate then, after being thoroughly washed, will possess a very high quality if it were originally a good one.

We may say that in the four methods thus briefly described we have all that we need desire for portrait or landscape intensification or reduction.

**Royalty and Photo-Ceramics.**—We last week said that, while the Duchess of York was staying at Longford Hall, she visited the Royal Glass Works at Hatton, and subsequently the establishment of the Photo-decorative Tile Company. Here she sat for her photograph, which is to be reproduced in the form of "photo-models." Photo-ceramic work and photo-sculpture has never "caught on" to any great extent, but for what reason it is a little

difficult to say. When, some years ago, the Princess of Wales ordered a tea service to be decorated with photographs of her own taking, it was surmised by some that an impetus would be given to ceramic photography by the *élite* of society, but it did not to any great extent. Photo-sculpture was introduced in the early sixties by François Willème, and worked commercially in London by the late Mr. Claudet. By this process both busts and bas-reliefs were produced in Parian and plaster and very excellent they were, yet the thing was not a commercial success. During late years several different patents have been taken out for producing bas-reliefs in various plastic materials and metal, but the demand has hitherto been limited, why, as we have said before, it is difficult to surmise.

**"Faked" (?) Photographs.**—On more than one occasion we have alluded to photography in connexion with the famous Dreyfus case in France. Amongst the most amusing evidence, according to the reports that have been brought forward by the prosecution, is that of the expert in handwriting and photographer, Bertillon. It is said that, at the close of last Friday's proceedings, the counsel for the defence, with experts, were occupied in carefully examining the photographs shown in the Court by M. Bertillon, and they have come to the conclusion that they must have been touched up. Of course, the defence will call for the negatives from which the photographs were made, and if they succeed in obtaining them, which in this extraordinary case may be doubtful, the sophistication will be exposed. The sophistication of photographs, whether negatives, prints, or enlargements, that are shown as evidences of handwriting or forgery, is nothing less than forgery itself. But in this famous case forgery has figured so largely that photographic forgery may pass unheeded, though it is doubtful if Me. Labori, the unfortunate prisoner's counsel, will allow it to do so—that is if he can help it.

**Another New Telescope for Photographic Purposes.**—The New York correspondent of the *Standard*, writing one day last week, gives an account of the new telescope now being constructed at the Harvard University for photographing the new planet, Eros. He says the designed focal length is 162 feet, while the aperture may not exceed a foot by more than one or two inches. It is intended to mount the instrument permanently in a horizontal position, and to observe or photograph the image by a mirror, the earth's motion being compensated for by a clockwork arrangement. This novel instrument, designed, we believe, by Professor Pickering, will be practically a horizontal photo-heliograph, and will give images of the moon exceeding a foot in diameter, even without enlargement, and it is expected that it will surpass the best instrument yet made. A well-defined photograph of the moon, taken direct without enlargement, over twelve inches in diameter, will be both interesting and valuable. We congratulate our American cousins on their enterprise in astronomical matters and also on the possession of the finest large telescopes in the world.

**The Guérin "Blockade" and Photography.**—Most people have read with some degree of amusement about "Fort Chabrol" in Paris, in which Mr. Guérin and a few of his followers have installed themselves, its attempted siege and blockade. Doubtless, many photographs, and also cinematographs, have been taken from the surrounding houses of the scene and the tumults in front of the "fort"; all these are, of course, interesting. We now read that Mr. Guérin spends some portion of his time in smoking cigarettes and taking snap-shots of the gendarmes, police, and firemen who are blockading his fort. Now, for this kind of work he is at a great advantage over all outsiders, for from nowhere can they be seen to such advantage as from his fort. A collection of these photographs, if published, would, doubtless, command a considerable sale throughout Europe and America, as illustrating how one man and a dozen or so of his followers keep the gendarmerie, police, and firemen of Paris at bay for several weeks by simply threatening to shoot.



**Engravings and their Value.**—We have frequently chronicled the high prices that engravings sometimes realise at auction sales. A fortnight back a correspondent wrote, asking the probable value of a couple of engravings he possessed—reproductions of Morland's paintings. We are quite familiar with these engravings, and they are of various degrees of merit as prints, and their commercial value is in accordance. When the high price sometimes quoted is given, it is by connoisseurs for exceptionally fine prints. One print may fetch, say, fifty pounds, while others from the same plate may only realise a few shillings, so much depends upon the state of the plate when the impression was taken. When talking to an old copper-plate printer on this subject some time ago, he told us, as an expert, that he could detect a difference in the quality after twenty impressions had been taken from a copper plate, and a very marked difference after forty or fifty impressions had been pulled. This will fully account for the different values of prints from the same plate. With steel plates the difference between so small a number of impressions is not so manifest as with copper plates—that is, the copper plates of forty or fifty years ago, before "steel facing" was introduced.

STEEL facing, it may be mentioned to the uninitiated, consists in depositing on the copper surface, by electrotyping, a thin layer of iron in an exceedingly hard state, hence the term "steel facing." That is always done with photogravure plates, which are of copper. In this way the copper plate becomes as durable as if it were of steel itself, practically more so; and for this reason, when the iron surface shows signs of wear, it can be cleaned off by simply dissolving it off with dilute sulphuric acid, and then depositing a fresh coating of the iron. By this means the plate becomes practically everlasting; and, if care be taken not to use the plate after it begins to show signs of wear, and before refacing, there will be no material difference between the two-thousandth impression and the first proof. It might be thought that plates with delicate detail, such as photogravure plates, would have their delicacy impaired by the film of iron, but that is not so in actual practice. Theoretically it is, but that is met by the fact that the steel surface has, as it were, a greater ink-holding property than the bare copper would have. In the old days of copper-plate engraving—line and mezzotint—steel facing was unknown; hence the great difference between the first proofs and later impressions, and the difference in their value in the eyes of connoisseurs.

#### ON THINGS IN GENERAL.

I HAVE always understood that the editorial and the advertising departments were distinct and different institutions in connexion with journalistic matters generally, though, I think, if the truth were known, there would be found a mysterious bond existing, a bond that links but which yet is not without its moments of chafing, when, indeed, the office chair is not a bed of roses. Otherwise, how is that we see in the society papers, for example, that when some special article, some specific for personal use, or say editorial discomfort, receives flattering notice, we can generally find in the non-literary columns a paying "ad." upon the subject? I don't, of course, for a moment think a high-toned paper like the "BRITISH," for example, could be influenced in such a direction—far from it—a glance at a few weekly issues will show that no such base influence exists therein; and, indeed, the fact that led to this train of thought had a direct contrary tendency. I happen to have an English-made quarter-plate camera—quite recently introduced, it is true—up to date in every way, leather-covered swing back, compact, portable, lens with T. & I. shutter—in fact, a model camera; yet, when I opened my JOURNAL one morning, after fondly putting away my new toy, I noticed our genial "Cosmos" lamenting that no English manufacturer could be found to put on the market a camera like those excellent ones sent out in

such numbers from the various Rochester manufactories. Yet, and here I come to my point, the particular camera I refer to was at the time advertised, and had been advertised, in the very columns of this JOURNAL. It is evident that, however up to date the maker was in producing cameras, he was lamentably deficient in "business go," or he would have shouldered—or, rather, pocketed—his camera and invaded the editorial quarters at the earliest date. If it were not contrary to journalistic ethics, I would name the camera. My readers may find it for themselves in the advertising columns. Apart from this question, it is positively marvellous to note the ingenuity displayed in the production of the modern quarter or third-plate camera. Within a space of less than six inches square or about two inches thick to find concealed a first-class camera with swing back, rack-work focuser, leather bellows, lens, high-class shutter, &c., would appear almost impossible were it not to be seen in every dealer's shop in the country.

Speaking of dealers calls to mind the painful letter from "A Would-be Dealer" which appeared a week or two ago. A photographer, deciding upon starting a store for photographic materials, altered his premises, and ordered his plates. When too late, he found that he could not buy his plates wholesale because a certain society had determined that photographers, though they were *bona-fide* dealers, were not to be supplied at wholesale price unless they had special permission, and such permission was withheld in the present case. The Editors of this paper have time after time girded, and properly so, at the photographer for permitting the chemist to usurp his proper functions in supplying amateurs with materials. He recked not of the "Manufacturers' Association." Lest others may be inclined to follow that advice, and be disappointed like the correspondent above mentioned, I should like all photographers to know that most of the plate and paper-makers have combined to fix terms—a very proper thing, it may be observed *en passant*; but they publish no rules, and they have hitherto only been heard of incidentally, and do not inform inquirers what sales or purchases must be made to entitle the inquirer to be put on dealers' terms. A recent circular of one of the plate-makers as sent out to wholesale dealers, *i.e.*, those who supply the retailers, says: "No manufacturer shall allow more than the above terms [*i.e.*, a *maximum* of ten per cent.] to any photographer, whether he is also a dealer or not, without the consent of the manufacturers." Well, no one can grumble at this—the manufacturers have a perfect right to sell on what terms they like; but their application of these rules is liable to have an illiberal construction put upon it. Thus, any little chemist or stationer has had no difficulty whatever in expending a few sovereigns in a stock of plates and buying wholesale; but, when a photographer does a sale business large enough to bring in an income more than that of an average operator, he is refused permission to buy, except at such prices as will leave no profit whatever. I will conclude this part of my letter by a little matter of history. The coal-tar dye industry was originally a purely British one. It was confined to a very few makers, and some idea of its magnitude may be formed when I say that out of the manufacture of magenta alone it was commonly understood one firm netted a quarter of a million of money! Things went on merrily. The manufacturers declined to share profits where a legitimate expectation of sharing might be expected. Moral: The trade has left this country. For one ton of such dyes made here, far more than twenty are made abroad. Again, a quarter of a century ago British albumenised paper was the best in the world; the foreign make was a striking abomination. Nowadays the foreign commands the market. History repeats itself. There was no dye like the British. There is no plate like the British. What will be the case in a few years' time?

*Apropos* of this aspect of matters, remarks have been made upon the fact of so few amateurs taking up that beautiful process, carbon. Here the very question first discussed creeps in again. It is true there are very few professional photographers even who do carbon work on their own premises, but wherever it is done, surely there, of all places in the world, should the Editors' advice be taken and the professional photographer give lessons and supply material. But he is precluded from doing so by the fact that the carbon-material manufacturers



of the country do not encourage the amateur to get his materials through middlemen, on account, one must suppose, of the liability of the process to incur disfavour if stale materials were to be sold.

Respecting carbon work, it is well known that the leading objection to its use for portraiture is the fact that a direct carbon print gives a reversed image, and that to get it non-reversed involves the transfer of the print to another piece of paper. This is an operation liable to failures, but can easily be mastered with care and practice; while for enlargements, of course, it is only necessary to take a reversed negative, which gives a non-reversed print. It is not known to every one, but all practical photographers who have had experience in enlarging are aware, that if a portrait is reversed it is invariably a dead failure. This is singular, but true. Of course, the explanation is that faces are not symmetrical, and the want of symmetry is at once seen when the features are presented in an unusual way, as is the case when they are reversed. In the old wet-collodion positive days people were not so particular; a portrait then was a curiosity, and more interest was shown in the marvellous truth with which a piece of lace was reproduced than in the mere features. But, even in those days, I call to mind one photographer—a Liverpool artist, who did some of the best work in the country—who invariably mounted his portraits with the collodion side down, and so had them non-reversed.

There is a reference to collodion in the Correspondents' column, p. 528, where an inquirer wants to get ether as cheap as they can buy it on the Continent. The Editors rightly draw attention to the fact that, if it could be bought cheap there, it would become dear if it were brought here because of the duty that the Excise would enforce. But "Collodion" may be interested to know that he can buy ether made from methylated spirit for one-fourth the price of that from pure spirit. For such purposes as enamelling the methylated ether is every bit as good as the other, but for wet collodion its use is to be deprecated. All old-collodion workers are familiar with the penetrating, eye-smarting effect of coating a plate with old collodion. No such effect was produced when collodion was first sold at about a shilling or eightpence an ounce, but when the price came down to ten shillings a pint methylated solvents became the rule, and operators' eyes suffered in consequence. The effect was caused by the action of the iodine (liberated from the iodiser when the ether became "ozonised") acting on the wood naphtha, when the acrid compound was quickly produced.

In the same column I note an inquirer asking about cheap lenses and the Editors giving some sapient advice. I should like to add to the list of advantages that accrue from purchasing a good lens by a well-known maker. If occasion arise when it is desired to sell or exchange a lens, it will usually be found that a lens by an unknown maker will fetch very little indeed, while one from a maker of repute can always be sold with a small margin of loss only, and this is a very important point to consider when purchasing.

I read with much interest Mr. Pike's remarks upon cheap advice and cheap cameras, and I agree heartily with most of them. Where I disagree with him is in the comparison he makes between, say, a guinea and a ninety-shilling hand camera. Now, I have handled and examined some scores—I may say hundreds of hand cameras, and my opinion generally is that in no class of camera work made do you get more value for your money than in the various makes of hand cameras. With regard to requiring, when four guineas is paid, that the lens should be by a recognised maker of repute, it should be noted that, if we examine the lists of, say, Ross or Dallmeyer, a 5 or 5½-inch lens, that being the usual hand-camera focus, will almost reach that sum of itself.

I was much struck in reading the account of American dry-plate manufacturers by Mr. William F. Miller that the light employed is a deep ruby, and never a combination of orange and ruby. Now, if any one will put a plate under a piece of ruby glass and one of double-flashed orange, and allow the light to pass through, he will find on development that the ruby, which to the eye is much darker than the orange, will give a much-fogged plate after an exposure that will leave that under the orange plate intact. Surely there is something here requiring explanation.

FREE LANCE.

## THE ORIGIN AND HISTORY OF CERTAIN TRIPLE ANASTIGMATS.\*

DR. RUDOLPH STEINHEIL and Emil von Høegh, of Wilmersdorf, Berlin, in Eder's *Jahrbuch* for 1897, described respectively the origin and history of the orthostigmat† and the triple-lens anastigmat.‡ Dr. Steinheil's paper was largely concerned with the development of the late Adolf Steinheil's researches, and is of very great interest, though perhaps fuller details, especially as regards the mathematical part of his work, might well have been gone into.

After Adolf Steinheil had discovered several constructions in astronomical optics, he set to work in the province of photographic optics, then, especially, a much more difficult one. The first result of his labours in this direction was the "periscope," a double-lens objective consisting of one sort of glass only (fig. 1).§ For this very reason, however, though marred by the non-coincidence of the "visual" and "chemical" foci, in all other respects it fulfilled the conditions of a photographic objective. Thus, by the employment of small apertures, a field of vision of 90° may be obtained; astigmatism in this field up to 30° was nil (see fig. 2). His attempt to make the periscope achromatic led Steinheil to the construction of the "aplanat" (fig. 3). This was free from chemical focus, and gave great sharpness at  $f/18$ , but astigmatism appeared already at the tenth degree of the field of view (see fig. 4). Endeavours to lessen the astigmatism led to the "wide-angle aplanat" (fig. 5). The astigmatism in this did not appear till about the fiftieth degree (see fig. 6), but at the expense of sharpness and flatness of the object. In the course of these researches Steinheil had already discovered that the astigmatism became less in proportion as the exponent of refraction of the crown glass approached that of the flint glass. On this account he worked out the wide-angle aplanat with light and heavy flint instead of with crown and flint. The attempt to produce the positive lens out of a more highly refracting medium forced him at last to give up the symmetrical form of the aplanat, and led him to the unsymmetrical type of "antiplanat." This objective, called the "group-antiplanat," thus evolved, was the first objective which contained an element of correction of astigmatism; nevertheless, it could not be made to act satisfactorily on account of the sorts of glass which were then obtainable. With regard to astigmatic correction the following principle may be laid down: An objective can be astigmatically corrected if it contains between two media a dividing surface which turns its concave side towards the more strongly refracting medium. Similarly, an objective can be spherically corrected if it contains a dividing surface between the two media which has its convex side turned towards the more strongly refracting medium.

From these two principles it may at once be seen that it is impossible to construct, out of only two lenses, an objective from which the chromatic, spherical, and astigmatic errors are simultaneously eliminated, a proposition which has long been known. Neither, of course, can a spherically and astigmatically corrected system be produced by the combination of two such symmetrical double-lens objectives. The attempt must be made to produce such a system by the employment of only four lenses, divided into pairs by a large interval. In this case it will be found necessary that the dividing surface between one pair should turn its concave side to the strongly refracting medium; the surface between the other pair should turn it to the weaker; then one pair will be astigmatically, and the other spherically, corrected. This arrangement occurs in the "group-antiplanat," as may be seen from fig. 7, in which the index of refraction of each lens is written on it. There was, however, still one defect to be found in this construction, the correction of which was quite impossible for A. Steinheil. At that time there were no glasses which, when they were of higher refraction, were not also necessarily of greater dispersion. Consequently the astigmatic correction in one pair of lenses could not be made good enough, because in so doing other errors were entailed in so great a degree that it was impossible for them to be eliminated in the other pair of lenses. Thus, in point of fact, fig. 8 shows but small advance from fig. 7.

As soon as the Glastechnische Laboratorium succeeded in producing a glass of higher refraction with lower dispersion, this difficulty disappeared. Indeed, the anastigmatic objective, patented by the firm of Zeiss, in Jena, is of the same arrangement as the "group-antiplanat," only the flint glass in the first lens of the antiplanat is replaced in the anastigmat by the new glass, and the front and back lenses are exchanged

\* Communicated by Philip E. B. Jourdain. Figures may be found in Eder's *Jahrbuch* for 1897, pp. 173-180, where fig. 31 + x corresponds to fig. x here.

† "Entstehung und Geschichte des Orthostigmat." *Jahrbuch* for 1897, pp. 172-181.

‡ "Ueber dreilinsige Anastigmate." *Ibid.*, pp. 75-80.



(see figs. 7 and 9). It is clear from the above reasons that the introduction of this new glass produces a far better correction of the astigmatism, and also that the Zeiss anastigmat much excels the "group-antiplanat" in anastigmatic flatness of field (see fig. 10). Having become acquainted with this new glass, the idea now occurred to Steinheil to introduce a correction of astigmatism into the anti-planat with the help of this new glass. Naturally the halves of the same must consist of not less than three lenses, since they must be spherically as well as astigmatically corrected, also they must contain at least two dividing surfaces between two media. He discovered two forms of this sort. In one a negative lens is enclosed between a biconvex lens and a positive meniscus (fig. 11), of which one possesses a higher, the other a lower, refractive power than the enclosed negative lens. The second form consists of a positive meniscus, which is enclosed between a biconvex and a biconcave lens (fig. 12), which both possess a higher refractive power than the enclosed meniscus.

The mathematical calculation of these two forms was of long duration—many months, in fact—as Rudolph Steinheil was then being instructed by his father by this very work, "and a free hand was given to him in order that he might gain experience by making blunders." At last a specimen of aperture  $f$ -12 was made, and on March 25, 1893, a patent was applied for with the following claims:—

An objective which consists of symmetrical or similar (differing only in scale) halves, each half formed of three cemented lenses, of which (1) the first is biconvex, and consists of a kind of glass which possesses the highest refractive power of the three employed; (2) the second lens is biconcave, and is made of the most dispersive of the three sorts of glass; (3) the third lens is a positive meniscus, and is made out of glass which possesses less power, both of refraction and dispersion, than the second lens. The lenses in the other half are united in reversed order.

Thus, a patent was applied for for only one of the two discovered forms of the antiplanat, but in this he was forestalled by Goerz, of Berlin. With regard to the published announcement, Steinheil, in his paper, stated: "This announcement of the patent (on May 5, 1893) was on the same principle as the previous one, though, indeed, in the first announcement, that discovery of Steinheil's, for which the patent had principally been sought, did not occur. So that, only after this thing had been mentioned by C. A. Steinheil, did the applicant so formulate the definition that it did not comprise something else which had long been known. In the new form of Goerz's patent the conditions were almost exactly the same as those stated above. Some differences were, indeed, to be found, which at first gave some hope that a patent would be conferred on both inventions. In any other country this would have been, and indeed has been, the case."

But Steinheil's patent was definitely refused in 1895, and he somewhat naively remarked that "the next thing to be done under these unfortunate circumstances was to unite with the more lucky applicant, Goerz." But an attempt to do this collapsed.

In November 1893 the second constructive form—a positive meniscus enclosed between a biconvex and biconcave lens—was announced as a supplement to the application for a patent on March 25, 1893. The Office of Patents declared this to be of a nature varying from that of the first, and that consequently it could not be treated as a supplement to it. It had, therefore, to be handed in as a separate application. When it was finally brought out, the firm of Goerz laid claim to it also, and succeeded by continuous protestations in causing the patent to be granted only in July 1896 (No. 88,505).

Meanwhile the objective of the first form, under the name of "Orthostigmat, Type I," in two series, C of  $f$ -7 and D of  $f$ -10, was made by Steinheil in Paris, where a patent had been granted to them. (Fig. 13 shows to what degree astigmatism is eliminated in Series C.) In Germany these objectives may not be produced or sold, since the protestation of the Steinheil firm in the summer of 1895 against the infringement of their right of precedence has not yet (1897) been attended to.

The Patent, No. 88,505, appeared as Type ii.  $f$ -68 (correction shown in fig. 14).

Finally, Dr. Steinheil again, rather naively, remarked that unfortunately Adolf Steinheil died three years before even this one objective was allowed to appear "with the knowledge that honest labour does not always succeed in German territory when moral certainty of justice and the literal interpretation of legal paragraphs stand opposed to each other."

[Note by Mr. Jourdain.—It was quite impossible not to believe in the complete independence of Steinheil's work, but it is even still more so now that Dr. Steinheil has so frankly given the historical development of a very remarkable discovery in the theory of optical instruments. I regard this paper as important, not only on account of its literary interest as

showing the amount of credit due to an eminent worker in optics, but also, and in a far greater degree, as giving an outline sketch of the means employed for attacking a very important scientific problem. From this point of view it is of the highest educational value, an initiation into the methods of a very capable man—a lesson which cannot fail to bear fruit if studied, and which cannot be found in "text-books." It is much to be wished that English opticians would, with this object in view, sketch their own mental processes with greater mathematical details than Dr. Steinheil has done].

DOROTHEA PEVERIL TURNBULL.

(To be continued.)

## ESSENTIALS IN THE SUCCESSFUL DUPLICATION OF NEGATIVES.

TWENTY years ago the systematic reproduction of negatives was probably unknown; sporadic cases occurred which could not be set aside, but the results were predestined to mediocrity because of the traditions that hung over any negative bearing the impress of duplication. To-day prints from reproduced negatives gleam at us from every shop window, and glance down upon us from even exhibition walls, yet the wisest among us hesitates in pronouncing upon the primigeniousness or otherwise of the negatives. So imperative became the need for reproduced negatives bearing some measure of primal excellence, that constant effort and improved methods broke through the tradition that any reproduced negative must of necessity stand apologetically as a reproduced negative, and beg the world to lay aside its criticism where it was concerned. And yet at the present time there are many to whom the duplication of a negative is little less than an ordeal where it should be a matter of course, and the result a whited sepulchre where it should challenge comparison with the original. It is for the help of these individuals, who in all probability need but a few hints of essentials to set them on the right road, that these lines are written.

The first essential in negative reproduction is a suitable transparency, and, taking all things into consideration, it is difficult to beat carbon for this purpose, the tissue specially prepared for transparencies being implied. The transparency must be fully, but not over, printed, and should be clear and crisp in appearance, with bare glass in the highest lights only. Too much attention cannot be paid to securing the best result that the negative will give, and time and trouble expended in procuring a high-class transparency are well repaid when the time comes for making the reproduced negative. Above all, aim at securing a "clean" result, as defects in any form assert themselves most unpleasantly in the reproduced negative, especially if it is an enlarged one. It is a good plan to get a transparency at the outset from any negative that is likely to be of more than passing interest, for, by procuring the transparency before the negative is put into the printer's hands, one ensures freedom from that legacy of spots and blemishes that a much-printed negative is so ready to bequeath. Give the transparency, when obtained, a coating of good enamel collodion, well filtered, and to which some germicide has been added, store in a dry place; then, when the original negative comes to grief or requires duplication, you will reap the reward of a thrifty and provident action.

But suppose the negative you desire to reproduce is rather over-exposed and flat, and in all probability thin as well. In such a case carbon is probably not the best medium for the transparency, as it is difficult to get the vigour and gradation from such a negative that are desirable, and intensified carbons are rather to be avoided in reproduction work. When such a negative has to be worked from, a transparency on a slow dry plate gives by far the best result, as exposure and development can be made to obviate in a great measure the defects of the original. In fact, where such an original exists, it is quite easy to supersede it by making a reproduction with at least fifty per cent. more printing quality. Do not make the dry-plate transparency dense, that is a fatal error; the shadows must be perfectly transparent, not having the heavy "blocked" appearance so easily obtained when using dry plates for transparencies.

Where necessary, print clouds in the transparency; this saves a vast amount of labour in double printing if the landscapes require clouds inserting, and in such processes as platinum and carbon printing, where successfully masking the landscape portion is not always easy, the gain is obvious. The neatest and readiest method of introducing clouds in the reproduced negative is to have a series of carbon cloud transparencies on plates a size larger than the landscape transparency; thus, for whole-plate transparencies clouds on  $12 \times 10$  plates. The



clouds in the 12×10 transparency should be printed well above the meridian of the plate, and carefully vignetted away at the lower edge, so that we have delicate clouds on the top half with almost two-thirds of the plate represented by bare glass. Against this cloud transparency, the landscape transparency, with its sky portion perfectly bare glass, is placed and carefully moved about until the sky portion is occupied by a suitable mass of the carbon clouds, the clear glass portion being against the landscape part of the transparency to be copied. The landscape transparency is then supported on the cloud transparency during copying operations by two strips of strongly gummed paper along either edge. It is perhaps necessary to say that the cloud transparencies should be either varnished or collodionised to prevent abrasion.

Much has been said and written against the use of dry plates for reproduction work, wet plates being extolled in the most extravagant manner. After fifteen years' experience with dry plates for this class of work, I can commend them with the utmost confidence, as giving results in no way inferior to the finest wet-plate reproductions, provided always that care is exercised in selecting a dry plate suitable for such work. It should be slow—i.e., about 40 H. & D.—fine in grain, and not thinly coated. "Process" plates are not suitable for this work, at least those prepared for "line" work are not, although I know of one important firm who very recently were making all their reproductions on these plates; but the results were extremely unsatisfactory, as, in order to avoid black-and-white prints, the negatives were kept thin, with the consequence that the print had a uniform dead tint significant of unskilful reproduction. The exposure should be nicely timed, and the plate will then develop exactly as though it were a landscape negative at first hand, the density, of course, being neither greater nor less than would be given to a primary negative.

Equality of illumination is a point that requires very careful attention, otherwise the reproduced negative will be patchy and of uneven density. An amount of unevenness in the illuminating surface that would easily be overlooked by the eyes would be quite sufficient to mar the evenness of the reproduction. The most reliable source of illumination is a clear space of north sky filtered through ground glass; failing this, satisfactory results may be obtained by using a white reflector behind the transparency, care being taken that nothing in the vicinity casts the least shadow on its surface. Rigidity of apparatus is also a point very apt to escape attention, and, where the exposures require to be of some length, as in large cities during the winter months, much annoyance may be caused through loss of plates by vibration. Finally, in cold winter weather too much attention cannot be paid to keeping the solutions at a constant and suitable temperature; it is impossible to get good, uniform results with the developer varying in temperature, and often as low as 50° F.

GEORGE T. HARRIS.

#### FLORAL PHOTOGRAPHY.

"Nor all flowers serve well for photographs. The beauty of the picture is enhanced by considerable masses of light and shade and by rounded forms giving gradations of shade. A multitude of small blossoms scattered over the plate," says Mr. J. A. Anderson in the *Photographic Times*, "is not likely to prove satisfactory unless the arrangement of stems and foliage gives pleasing lines and masses. With flowers in this connexion may be included other subjects, as wheat heads, oats, some grasses, a branch from a cotton plant with fluffy balls, many weeds, &c.

"Pansies are very effective when properly selected as to colour and its distribution. The brilliant reds and yellows of poppies have not, with the writer, proved effective in the photograph, even with the ortho-plate and yellow screen.

"The drooping of flowers during exposure often causes failure. To obviate this, some successful workers lay the flowers on a glass plate, with the background below, the camera being so suspended as to point downward. With this plan water cannot well be used for keeping flowers fresh, and the petals even in this position are still liable to droop.

"A serious objection lies in the reflections from the glass. These may be avoided by using ground glass or celluloid with a dull surface, but this shows shadow of the subject, which also is not a desirable feature. The shadow may be removed by reflectors, but this also removes the shadows in the flowers and makes a flat picture.

"Some good apparatus has been devised for supporting the camera pointing downward, and the glass upon which the object photographed lies. The best to which the writer's attention has been directed is well adapted to the purpose, giving all necessary adjustments. Its weight is about fourteen pounds. The writer has constructed an arrangement weighing as many ounces, in which the camera is supported by the tripod legs. The tripod head, with one leg, is attached to the camera in the usual way, the other legs, connected with suitable pins, in a light strip,

attached by a simple method to the top of the camera, which, in the changed position, is the front.

"The adjustments are readily made by the legs. A celluloid sheet, with dull surface, lies on a light frame, suspended from the legs by strings, and kept from swinging by a chair set against it. This whole method, however, is objectionable for the reasons before indicated, and the vertical position of the subject seems to be the best.

"It certainly admits of more natural and artistic arrangement than can be made with the other plan and better opportunity for correct lighting of the subject and the background. If flowers are photographed immediately upon being gathered, they will often retain the desired position during a considerable exposure. It is well to know, however, that after cut flowers have been in water for some hours the drooping ceases for a time, and the exposure may then be made with little risk of movement.

"The background is an important feature. Some recommend black for general use. This does very well for some subjects, but for most the writer has found a grey the most pleasing. Grey packing board, drawing paper, or wall paper, all do well. Where specks or markings exist on the surface, they may, if not too large, be obliterated by placing the background far enough behind the subject to throw them entirely out of focus. The writer's best results have been with a yellowish-grey felt wall paper, two or three feet behind the subject, and shaded from light below to medium dark above by adjusting the window curtains.

"In selecting the subjects to be photographed the first thought is apt to be of a bouquet or mass of flowers placed in an attractive vase. This, no doubt, is often pleasing, but more artistic results may be had by discarding the vase and showing only the flowers with stems and foliage. Again, a few flowers, and sometimes a single one, may prove more effective than a group of many. A mass of lilies of the valley is always beautiful, but a spray or two of the flower, with a leaf, may make a preferable picture. A single rose may be better than a large bunch. With pansies, daffodils, and other small flowers, several blossoms may well be used, but even with these the number should be limited, both on account of better general effect and the larger size possible for each blossom. Foliage should be introduced when practicable. This is often as effective as the flower.

"The general arrangement of the subject should be such that it shall appear suitably on the plate, covering it artistically in graceful lines, and not too close to the edges for effective margins, although a spray or leaf may be cut by the side of the plate if the general arrangement renders it desirable and the proper balance is preserved. This is often better than having it terminate very close to the edge. In this part of the subject, however, experience and observation must guide, with such taste as the operator can apply.

"The flowers, if the support is not to appear, may be placed in bottles, or held up by clips, or even suspended by the stems from some extemporised support. Dandelion seed heads, that refuse to stay as placed, were strengthened by flexible wires run up the stems. Such wire may be placed behind stems or blossoms to keep them in position. A cork or bunch of cotton in the mouth of a supporting bottle, or a clip, properly placed, may serve a like purpose.

"It is well to get the parts as nearly as may be into one plane. This cannot be done accurately, nor is this desirable, but an approach to it admits of focussing without excessive stopping down and consequent lengthening of the exposure. Also, if the difference in distances from the lens is considerable, the relative proportions as to size are not preserved.

"Sharp focus everywhere may not always be best. A receding spray or leaf a little out of focus may be a good feature, but one projecting unduly toward the camera will appear larger than it should, and its lack of sharpness will mar the general effect.

"True colour values cannot be obtained without the use of orthochromatic plates.

"The writer has understood that success had been attained with plain plates and very long exposures, reducing the light where necessary to obtain this. He has met with no success in this direction. Where yellows and deep reds occur, the yellow screens seem to be needed in addition to the orthochromatic plate.

"This, however, prolongs the exposure to four or five times the length needed without it, and it should not be used when it can be avoided.

"A slow plate gives best results. Acting upon the advice of a gentleman of much experience in this line, the writer has found Cramer's slow isochromatic plate entirely satisfactory. As to size of plate, this must depend a good deal upon what money one wishes to put into his work. The writer began on very small plates, and now uses 5×7. A large plate gives opportunity for better display of the subject, but whether this compensates for the additional cost, &c., each must determine for himself.

"The length of exposure depends so much upon variable conditions that it can only be found by experience. Careful notes made of the light, aperture, plate, subject, and other conditions, will aid in determining the time, which, with the writer, has varied from three to thirty or more minutes.

"Placing the camera with reference to the subject will not be difficult when one has become accustomed to working. To the beginner the following simple rule may be useful: Add together the size in one direction of the part of the subject to appear on the plate, and the corre-



sponding size desired for the image. Multiply the sum by the focal distance of the lens. Divide the result by the size of the object for the distance of the ground glass from the optical centre of the lens, and by the size of the image for the distance of the object from the same centre. When the lens has been placed by this formula, a little fine focussing is all that is needed.

"It is well to use a short-focus lens, especially if working anywhere near the full size of the object. Full size requires extension of the camera to twice the focal distance of the lens, which most cameras will not admit of with lens of long focus. It is to be noted, too, that double the distance requires four times the length of exposure required for the same aperture at the equivalent focal distance.

"A northerly light is best. If this is not convenient, and an exposure has to be taken with strong light, the light should be diffused by tissue or other means.

"As for printing, the best effects are found in platinum.

"Mounting must depend somewhat upon the use to be made of the print. A pure white card framed with a mat is always pleasing. The shaded 'Rembrandt' mount, black or grey is fine, especially if the print is made with a narrow white band around it."

## NOTES ON PEROXIDE OF HYDROGEN.

[Journal of the Photographic Society of Philadelphia.]

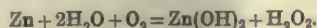
It is well known that certain bodies can, in the dark, act on the photographic plate. This action has been attributed to various causes. It is the purpose of this paper to show that it is probably due to the generation of hydrogen peroxide. It must be noted that these bodies act only in the presence of moisture. The plate always contains moisture, and would probably be inactive if quite dry. The change in the plate is rendered visible by the ordinary process of development. Quick plates must be used, as many pictures are formed only after very long exposure.

All of the results produced by metals and organic bodies on the plate can be produced by  $H_2O_2$ . The commercial three per cent. aqueous solution works as well as pure specimens of the same strength. To test the action of any liquid on a plate, we use a small crystallising dish, resting the plate on top of it. The amount of liquid determines the distance between the plate and solution. If we use pure water, we get no image. A trace of peroxide added will produce darkening of the plate. One part of peroxide in 1,000,000 parts of water, exposed eighteen hours, will produce a faint image.

Blotting-paper, by itself inactive, if wetted with a solution of 1 part  $H_2O_2$  to 500,000 parts water, and hung in a warm room to dry, when placed in contact with a plate for a couple of hours and developed, gives a distinct picture.

Certain metals and organic substances under certain conditions act on the plate.  $H_2O_2$  acts, under the same conditions, in the same way. The action of metals and terpenes is unable to pass through glass, mica, selenite, &c., but passes through gelatine, celluloid, gutta-percha, india-rubber, &c.  $H_2O_2$  acts in exactly the same way. They agree perfectly. Of tests for hydrogen peroxide, that with titanous acid dissolved in sulphuric acid is exceedingly delicate. This gives an orange-yellow colour with  $H_2O_2$ . Dr. Wurster's tetramethyl-paraphenyl-enediamine paper is also good, giving a deep blue colouration.

Is  $H_2O_2$  likely to be present in all the different cases where action on the sensitive plate occurs? First, in regard to the metals: The list of active metals, in the order of their activity, is magnesium, cadmium, zinc, nickel, aluminium, lead, cobalt, bismuth, tin. These are certainly the metals which, in the presence of oxygen, would decompose water and form  $H_2O_2$  :—



As a confirmation that  $H_2O_2$  is formed when these metals oxidise in moist air pieces of tetra paper were moistened and laid on bright surfaces of metal. The blue colour was obtained, varying in intensity in the order given. If the metal is supplied with more moisture, more action takes place. Two pieces of polished zinc were placed in contact with two plates and placed in two iron boxes, one absolutely dry and kept so with calcium chloride, the other kept moist under a bell jar. Through the first was drawn a current of perfectly dry air; through the second moist air was allowed to pass. On development, the first plate showed no image whatever; the second was quite distinct.

All organic bodies which act belong to the terpenes, which, when oxidising, generate  $H_2O_2$ . Already organized bodies do not act. Ordinary turpentine is very active. Most essential oils, as bergamot, peppermint, pine, lemon, &c., are active bodies. These are all terpenes, and are characterised by a strong odour. All vegetable bodies having a strong smell are capable of acting on the plate. Eau-de-Cologne gives a good picture. Thus, the plate is a test for all these bodies, and, as the action is cumulative, it may compete with the sense of smell. Vegetable oils, as linseed, &c., are quite active. Mineral oils, as benzole, naphthalene, phenol, aldehyde, &c., are not active. Hence all organic bodies capable of acting on plate give rise to  $H_2O_2$  when oxidised in moist air.

The speed of transmission through gelatine, rubber, &c., depends on the thickness.

How does the peroxide penetrate the gelatine? Not by diffusion, for hydrogen will not diffuse through it. It must be by a process of dissolving or feebly combining with it and, thus travelling through, escaping on the other side. That the action is of this nature is probable from this example: A sheet of gelatine, about  $\frac{1}{16}$  of an inch thick, was placed over a two per cent. solution  $H_2O_2$  and, resting on it, a plate allowed to remain twenty minutes. On developing it no picture was found. Immediately on removing this first plate a second was put in its place and allowed to remain twenty minutes. This gave a faint picture. A third was darker, and a fourth still darker, but five, six, and seven were, so far as the eye could judge, of the same density. Thus the amount of peroxide given off from the surface increased for one hour and twenty minutes, then the action became constant. The same thing occurs if zinc be used in place of  $H_2O_2$ . If a thin sheet of gelatine be laid on a piece of zinc and allowed to remain there a week, on placing above it a sensitive plate an image will be formed in from one-third to one-fourth the time required if previous exposure had not taken place.

GEORGE D. FIRMIN.

## ADUROL-HAUFF.

MESSRS. FUERST BROS., of 17, Philpot-lane, E.C., send us the following latest formulae for the use of Adurol-Hauff :—

### I.—SEPARATE DEVELOPER.

A.	
Adurol.....	10 grammes or 85 grains.
Sulphite of sodium (cryst.) .....	80 " " 1½ ounces.
Water .....	500 c. c. " 10 "
B.	
Carbonate of potash.....	60 grammes or 1½ ounces.
Water .....	500 c. c. " 10 "

For studio work and snap-shots take 1 part of A, 1 part of B.

For time exposures outdoor take 1 part of A, 1 part of B, 1 part of water.

### II.—ONE-SOLUTION (CONCENTRATED) DEVELOPER.

Sulphite of sodium (cryst.).....	200 grammes or 4 ounces.
Carbonate of potash.....	150 " " 3 "
Water .....	500 c. c. " 10 "
after all having been dissolved	
Adurol.....	25 grammes or ½ ounce.

For studio work and snap-shots take 1 part with 3 parts of water.

For time exposures outdoor take 1 part with 5 parts of water.

For plates inclined to fog add 10 to 15 drops of a ten per cent. bromide of potassium solution to each 4 ounces of developer ready for use, or add from the beginning 1 gramme (resp. 9 grains) of bromide of potassium cryst. to Solution B (I.), or 2½ grammes (resp. 22 grains) to the concentrated developer (II.).

The image appears in from 15 to 20 seconds, and is completely developed in 4 to 5 minutes.

Over-exposures can be rectified by adding bromide of potassium (1 : 10), or by using developer which has done service before.

If specially vigorous density and rapid development are desired, increase the addition of carbonate of potash in Solution B to 100 grammes (resp. 2 ounces), or dilute less the concentrated developer (II.).

The negatives are fixed in an acid fixing bath.

## SUGAR FOR RETARDING THE DEVELOPMENT OF VELOX.

DR. LEO BAEKELAND, who, we believe, is responsible for the preparation of Velox papers, contributes the following article on the above subject to an American contemporary :—

"The objection has often been made that the development of ordinary Velox is so very rapid as to give considerable trouble to the beginner. If one endeavours to make the image appear slower by diluting the developer, it often happens that the blacks have a greenish appearance. Special Velox papers are not open to this objection, for the reason that they can be developed with weaker developers, and can stand more bromide in the developer, still giving good, rich blacks. But special Velox papers can only be used with good strong negatives, and this is the reason why ordinary Velox is always preferred for such negatives as are too thin or too soft to yield good prints with other printing processes.

"Some time ago, Mr. Faraday West, of Point Elizabeth, South Africa, who used Velox continually, wrote us that he was able to slacken the development of Carbon Velox by adding sugar to the developer, without losing the rich colour of the black in the image. We submitted this method to a thorough trial, using variable quantities of sugar, and the result of our experiments shows that sugar is a very valuable agent for making the development of Velox prints much slower. The developer restrained with the sugar not only gives just as good blacks as if a quicker developer were used, but the developing power of the solution,



namely, the amount of prints which can be developed with a given amount of developer, remains the same. The action of the sugar seems to be an entirely physical one, by retarding the penetration of the developing agent into the sensitive film.

"Bromide of potassium, on the contrary, is a chemical restrainer, and that is undoubtedly the reason why it affects the colour of the resulting print, while sugar does not. This is why sugar cannot be used as a substitute for bromide of potassium for ensuring pure whites. For the latter purpose a small amount of bromide of potassium will always be necessary. We made our experiment with the regular M. Q. formula, and noted the following:—

"A normal solution will develop a Carbon Velox print in about five seconds. After adding to four ounces (about 100 c. c.) of same, one teaspoonful granulated sugar, the development slackened down to about ten seconds. Two teaspoonfuls increased the same to twenty seconds, and four teaspoonfuls increased the same to one minute. By adding seven teaspoonfuls, development was retarded to such an extent as to take five minutes, and, what is most remarkable, the blacks of the resulting image had no greenish tint.

"The amounts are given above in teaspoonfuls, but each teaspoonful corresponds to about one-third of an ounce, or nine grammes. We made similar experiments with glycerine, but did not obtain good results."

### THE APPARENT SIZE OF THE SUN.

[Popular Astronomy.]

ALL who have had occasion to examine the celestial sphere, in company with others, have noticed the wide differences in the estimated distances between any two bodies in that sphere as seen by different observers. Of course, a brief period of observation, with any correct thought of the true relations between the bodies apparently scattered over the concave serves to eliminate from the mind all recognition of distances other than angular. But a class of tyros is likely to make some very remarkable queries, such as asking the name of "that star about three feet below the moon," a distance so entirely obvious to the inquirer that he is perhaps greatly astonished to be assured by the general voice of the rest of the class that it looks as if it were ten or a dozen feet distant.

Evidently these variations in apparent distance are due to an unrecognised difference in the estimated distance of the celestial vault from the eye, unrecognised, probably, on account of the absence of all intervening objects serving the observer semi-unconsciously as standards of measurement. But an experience of twenty-five years with classes of youth inexperienced in such observations has led me to believe that the wide differences in these estimates can be explained by reference to a principle not unlike that underlying the errors which we are likely to make in terrestrial observations when all intervening objects are too unfamiliar to afford a satisfactory basis of comparison, and when changed atmospheric conditions invalidate our judgment resting on the clearness or dimness of vision.

I recall a visit to an isolated New Hampshire peak, where the barren rocks afforded no standards of comparison of known size, but allowed me to be deceived by the unusually clear atmosphere, so that I burdened myself with a load of wood designed for a fire upon the summit of a slightly more elevated peak apparently less than half a mile distant; but, after wearying myself with the load while travelling more than half that distance, and proceeding unburdened nearly as much farther, I secured a second supply, which in turn proved almost too much for my endurance before reaching the peak, where previous experience had warned me that fuel would be sadly needed.

So, too, having removed from the Atlantic coast, where my previous life had been spent, to a region of broader outlook and clearer atmosphere in Ohio, I found, while travelling along the unfamiliar level roads, that I was likely to consider men who were approaching me hardly larger than children of a dozen years, until, after an unexpectedly long approach, the error in judgment was revealed; and it required months of residence to enable me to acquire the ability to estimate with reasonable accuracy the distance to some place clearly in view, but as yet unvisited by me.

Possibly a fly moving across a neighbouring window gives, at first glance, a pang of righteous indignation directed towards the neighbour's hens and their proneness to cultivate our garden, a feeling quickly succeeded by the peculiar chagrin caused by the recognition of our erroneous estimate of distance.

In observations of the heavenly bodies the conditions are such as make such errors especially probable, while all basis for the correction of the first impression received is either lacking, or is of such a character as requires more or less comparison and reasoning. Hence it results, I believe, that at a very early age children form their conceptions of the distance to the overhanging vault dependent upon their knowledge of the objects associated in their vision with the more distant bodies apparently located in that arched canopy. I recollect one small lad who, like most young boys, probably saw the sun rise much less frequently than it passed from his vision behind, or nearly behind, the barn of the man who each day furnished the family supply of milk. He saw the sun disappear there at the distance of forty or fifty rods every evening,

and in the morning it was revealed working its way upward from the other side of the glen. So this boy evolved from some part of his interior consciousness the firm conviction that the milkman's son, Will, every morning bore the luminary, which had settled down to rest at his father's barn the evening before, back across the glen in the wheelbarrow which so often brought him the expected milk. I never had an opportunity, after learning this somewhat peculiar solar theory, when I might question its originator concerning the dimensions of the sun permitted by his scheme; but evidently it was only sufficiently large to make a suitable load for the familiar wheelbarrow; and, if the lad's estimate conformed to the principle which I have been led to accept by the very numerous inquiries which I have made of the members of classes coming under my instruction, the sun in that boy's thought occupied scarcely more room than the half-dozen little family milk cans which constituted the usual burden of that vehicle.

The inquiries which, as I have said, I have been making for so long a time, have been especially directed to the apparent size of the sun and moon; and, because to most eyes the moon seems to differ at different times more than the sun, of late my attention has been more particularly directed to reports about the brighter luminary. I have found that with different observers the apparent size of the sun varies from the size of a large wheel, afterward more definitely described as six feet or more in diameter, to the size of a silver dollar. This last estimate, however, has been presented only during the past year or two, and therefore I was at first naturally inclined to ascribe this new opinion to an increased estimate of the size of the silver dollar due to political considerations; but, further inquiry developing the fact that this unusually small estimate was confined to scholars coming from the same class of the same high school, that they had talked the matter over together to a considerable extent, and that sometimes it seemed to them much larger than that, the smaller appearance being only occasional, I was forced to the conclusion that there had been such unauthorised consultation as disqualified those young persons for jurors in the case.

Rejecting those connected estimates, I have found no estimate smaller than the top of a coffee-cup, or, on further questioning, between three and four inches across. From this size, or a little larger, to nearly or quite four feet in diameter, the estimates varied in nearly every class. The larger conceptions have been only rarely presented. The largest one, of six feet or more, was that of a young man whose earliest recollection of the sun was of seeing it sink behind the distant waves of the Pacific. My own early ideas of the sun I easily recall. I mentally fitted it to the top of my mother's best coffee-cups, a trifle larger than those in ordinary use. The home of my early days was amid the New England hills, where the morning sun appeared over a knoll perhaps twenty-five rods from the door, while in the evening it sank behind a hill a little more distant, but still very near.

The principle suggested by these extreme cases I have found to be sustained by a very large majority of the cases in which I have made made inquiry. Each class of students generally contains some who have formed no definite conception of the size of the sun. These students are likely to be among the number of those who have no definite recollection of the places of most frequent observation of the sun in their early years. Not infrequently their homes seem to have been often changed. Very rarely can they tell whether their first experiences were of the sun's rising and setting behind near or distant objects.

But among those who at the time of reporting have a distinct judgment of the apparent size of the sun, or, if that has been displaced by a correct angular conception, still are able to recall their previous estimate, and who also remember the conditions under which their unschooled vision was attracted by its appearance, among these, usually comprising about half of the class, the exceptions are rare to the rule that the estimate of apparent size varies as the distance of the horizon behind which the sun rose or set. It is especially marked that the average estimate of size is much smaller among New England youth reared amidst its hills than with those whose vision made first acquaintance with the broader fields or perhaps prairies of the West.

One other cause I suspect to have an influence upon this conception of size, although my investigations have been too nearly confined to the students under my instruction to furnish the careful comparison necessary to justify a decided opinion. But a limited number of examples has led me to think it not improbable that heredity has some weight here; although, of course, it is difficult to separate this effect, if it really exists, from results similar in character due to unconscious education of the child by the parent.

CHARLES H. CHANDLER.

College, Ripon, Wisconsin.

### EVOLUTION OF INVENTIONS.

THE crude devices of primitive man were improved by successive inventions, says Professor Cleveland Abbe, in an address recently delivered to the Franklin Institute. In the history of invention, properly so called, the simple collocation and juxtaposition of two ideas is often the critical matter. It is not science, or study, or art—it is simply the happy accident that brings some one's mind two thoughts that are suddenly seen by the inventor to have an important relation to each other



hitherto unsuspected. For instance, some one is anxiously looking about for a pigment that will produce a special tint of colour. He is wandering along the roadside and sees the colour he needs in a piece of stone or discolouring a ledge of rock. If his mind is ready to receive the suggestion, it becomes seed sown in good ground. The idea of grinding that stone into pigment immediately occurs to him. He proceeds to experiment, and not only grinds, but oxidises and even roasts the stone. The invention was a matter of suggestions to the inquiring seeker, but the art was an application of physical and chemical science. Man's needs have stimulated him to discover and invent. Those who enjoyed the best surrounding have generally brought forth the best results. Those nations and individuals who were unfortunate as to climate, soil, vegetation, minerals, water power, &c., those who had neither stimuli nor opportunities, did little. In proportion as we to-day associate ourselves with the highest science, we bring forth the best inventions and manufactures. Some one asks why we cannot make a steamboat that will go fifty miles an hour by the use of the screw propeller. The idea is good, but it is a mere matter of imagination, a dream, a useless suggestion until all the resources of physics and mechanics have been combined to evolve the modern high-speed vessel. Professor S. F. B. Morse was an artist, but was also seeking to make some great invention. The idea of communication by means of electricity, with the speed of thought, early took possession of his mind, and he was always on the look-out for some method of realising the indefinite hope that haunted him. Ten years were spent in making every conceivable combination of electrical devices, but nothing came of them. At length Dr. L. D. Gale suggested that Joseph Henry's recent researches on the electro-magnet be put to use. That distinguished scientist was consulted at Princeton, and immediately it was found that the laws that he had discovered in relation to electricity and magnetism, and the apparatus that he had made, were those appropriate to the Morse telegraph; that, in fact, he had one already at work. Even if you do not agree that we ought to speak of the "Henry telegraph" and the "Morse alphabet," you will at least grant that every step in telegraphy, from its beginning to the modern perfection of the art, has only become possible by means of the knowledge resulting from investigations conducted by scientists, or by inventors who had to become scientific investigators before they could complete their work.

#### THE CITY AND GUILDS INSTITUTE EXAMINATIONS IN PHOTOGRAPHY.

We have received from the publishers, Messrs. Whittaker & Co., of Paternoster-square, E.C., the programme of Technological Examinations to be held by the City and Guilds of London Institute during the Session 1899-1900. We extract the Syllabus relating to photography. The acting examiners are Mr. C. H. Bothamley and Mr. J. D. Geddes.

##### PHOTOGRAPHY.

The Examination in Photography will consist of two parts:—Section A, Pure Photography, and Section B, Photo-mechanical Processes. Candidates may be examined in either of these two sections.

##### ORDINARY GRADE.

The Examination in the Ordinary Grade of either section will consist of a *Practical* and a *Written* Examination.

No Candidate will be admitted to the Written Examination who has not previously passed the Practical Examination.

To enable Candidates to qualify for the Written Examination in the Ordinary Grade, Local Practical Examinations will be held at convenient times in the Session preceding the Written Examination. A Practical Examination may be held in any town where there is a class registered by the Institute, or in such other places, distant ten miles from the class, where at least five Candidates notify, through the Local Secretary, their wish to be examined. The Local Examinations will be held under the personal supervision of Examiners appointed by the Institute. The date at which a Local Examination is to be held may be fixed at any time between January 1 and March 3 that may be arranged between the Secretary of the Local Committee and the Local Examiner, provided that at least fourteen days' notice is given to the Institute of the day fixed for such Local Examination; and the Local Secretary will be required to forward to the Institute, within eight days after the holding of such Examination, under the signature of the Local Examiner, the names of any Candidates who may have satisfied the Examiner of their practical knowledge of photography.

The Candidate for the Practical Examination in either section may elect to make his negative in collodion or gelatine, and his print may be produced by any of the methods in ordinary use. He will also be allowed to supply, if he so desire, his own apparatus, chemicals, &c., or he may use those provided by the Local Examiner. The fee for the Practical Examination only will be 2s. 6d.

##### SECTION A.—PURE PHOTOGRAPHY.

I. *Syllabus*.—(1.) The Practical Examination will include the following tests:—To focus, expose, and develop a negative of a person or landscape; to print, tone, fix, and mount an ordinary print.

(2.) The Written Examination will include questions founded on such subjects as the following:—

1. The elements of Photographic Optics. The Photographic Camera and its adjuncts, lenses, diaphragms, shutters, shades, &c.
2. A general knowledge of the practice and theory of the wet-plate process.
3. The practice and theory of the gelatine dry-plate process; the composition of and defects in gelatine dry plates.
4. Various methods of fixing, developing, intensifying, and reducing negatives, with a general knowledge of the chemicals employed.
5. Silver printing, including vignetting and printing in clouds, toning, and fixing.
6. Retouching and spotting; mounting prints.
7. The lighting of the dark room.
8. The studio and the lighting of the sitter.

##### SECTION B.—PHOTO-MECHANICAL PROCESS.

(1.) The Practical Examination will include the following tests:—

To focus, expose, and develop a negative of a drawing in line or wash; to prepare or etch a zinc or copper plate (a) for a process block, (b) for a photogravure plate; to make a collotype plate or a photo-litho transfer.

(2.) The Written Examination will include questions founded on the following subjects:—

1. Cameras and lenses for copying and process work, ruled screens, prisms, reversing mirrors, the appliances in ordinary use for electric and artificial lighting for photographic purposes, and the apparatus employed in photo-mechanical processes.
2. A practical knowledge of collodion (wet and dry), and gelatine dry-plate photography.
3. A general knowledge of various methods of developing, fixing, intensifying, and reducing negatives.
4. A general knowledge of the properties of gelatine, albumen, fish glue, bitumen, resin, inks, etching solutions, and other chemicals and materials used in photo-mechanical work.

The principles and practice of at least two of the following processes:—

5. Photogravure.
6. Block-making—line, half-tone, and three-colour.
7. Photo-lithography.
8. Collotype.

##### HONOURS GRADE.

Candidates for Honours in either Section must have previously passed in the Ordinary Grade of that Section.

The Honours Examination is both Written and Practical.

Candidates in either Section may select the particular branch of practical work in which they desire to be examined.

In order that Candidates may know what apparatus and material they will be required to provide for the Practical part of the Examination, full information as to the practical tests may be obtained from the Examiner on Friday, May 4, for the Examination to be held on the following day.

For the year 1900, Practical Examinations will be held in London only, unless ten Candidates at least apply to be examined in the same Section (A or B) at some other centre.

The fee for the Honours Examination (Written and Practical) in either Section is 3s. 6d.

##### SECTION A.—PURE PHOTOGRAPHY.

(1.) *Written Examination*.—Candidates will be expected to answer more difficult questions in some of the subjects for the Ordinary Grade, and, in addition, a knowledge will be required of—

1. The theory of the photographic image, of development, fixing, intensification, and reduction.
2. The theory of light as applied to photography, including a general knowledge of spectrum and orthochromatic photography.
3. The principles of photographic optics.
4. The theory and practical use of sensitometers for testing the speed and gradation of plates, and their uses in printing processes.
5. The general principles of various negative processes which have been employed at different times.
6. Platinotype, carbon, and pigment printing, printing on argentic bromide papers; enamels.
7. Enlarging and making lantern slides in the camera.
8. Applications of photography to scientific purposes.

(2.) *Practical Examination*.—Candidates may be examined in—(a) Studio Work; (b) Copying or Reproduction; or (c) Landscape and Architecture. They will be required to show proficiency in conducting any of the following practical operations appertaining to the branch selected:—

1. To take in a studio quarter-plate gelatine negative of some object to be indicated.
2. To take an artistic portrait.
3. To print, tone, fix, and mount a silver, platinotype, or carbon print.
4. To test a sample of glass or fabric to be used in lighting the dark room.
5. To test the sensitiveness and gradation of a plate.



6. To find the focus of a lens either corrected or uncorrected.
  7. To copy an engraving for a lithographic transfer.
  8. To make an enlargement from quarter-plate.
  9. To make a lantern slide by contact.
  10. To make in the camera a lantern slide from a negative.
- The Practical Examination will be held on Saturday, May 5, between 1.30 and 7, and at other times, if found necessary.

#### SECTION B.—PHOTO-MECHANICAL PROCESSES.

(1.) *Written Examination.*—Candidates will be expected to answer more difficult questions in some of the subjects of the Ordinary Grade, and, in addition, to show a practical knowledge of the principles and operations in one or more of the following processes:—

1. Photogravure.
2. Line negatives and line blocks.
3. Half-tone negatives and half-tone blocks.
4. Chromo-typography (negatives and blocks for three-colour process).
5. Photo-lithography.
6. Collotype.

(2.) *Practical Examination.*—Candidates may be required to show proficiency in practical operations in one or more of the above processes, numbered 1, 2, 3, 4, 5, 6, including the preparation of negatives suitable for each class of work, from (a) pictures in colour, (b) drawings in monochrome, (c) originals in black and in tints, (d) natural objects.

The Practical Examination will be held on Saturday, May 5, between 1.30 and 7, and at other times if found necessary.

The Written Examinations in the Ordinary and Honours Grades will be held on Wednesday, May 2, from 7 to 10.

II. *Full Technological Certificate.*—Certificates are awarded on the results of each of the above examinations. For the full Technological Certificate, the candidate must qualify as stated in Rules 41, 42.

III. *Works of Reference.*—For the Ordinary Grade: *Chemistry of Photography*, Meldola (Macmillan); *Instruction in Photography*, Abney (Piper & Carter); *Manual of Photography*, Hepworth; *Practice of Photography*, Chapman Jones (Iliffe); *Art and Practice of Silver Printing*, Abney and Robinson (Piper & Carter); *Materia Photographica*, Leaper (Iliffe). For Honours, in addition to the foregoing: *Optics of Photography*, Traill Taylor; *Treatise on Photography*, Abney (Longmans); *The Chemical Effect of the Spectrum*, Eder; *Collotype and Photo-lithography*, Schnauss (Iliffe); *Photogravure*, Wilkinson (Iliffe); *La Photographie des Objets Colorés*, Vogel (Paris, Gauthier-Villars); *La Platinotypie*, Pizzighelli and Hübl (Paris, Gauthier-Villars); *La Photographie*, by A. Davanne (Paris); *Platinotypie*, by Abney and Clark (London); *Modern Heliographic Processes*, Ernst Liezke (Nostrand Co., New York); *Photo-engraving, Half-tone Enamel Process*, Whittell (Socvell Co., New York); *The Half-tone Process*, Verfaesser (Percy Lund); *Half-tone on the American Basis*, Cronenberg and Gamble (Percy Lund); *Photo-engraving*, Farquhar (Dawbarn & Ward); *Photo-lithography*, Frits and Wall (Dawbarn & Ward).

#### THE BRITISH ASSOCIATION.

THE British Association meets at Dover on September 13, under the presidency of Sir Michael Foster, Sec. R.S. The members of the French Association will visit Dover on September 16, and the members of the British Association are invited to visit Boulogne on the following Thursday. It is anticipated that the gathering will be memorable by the large attendance of the most eminent men of science in America and on the Continent. The Mayors and Corporations of Dover and Canterbury, the military authorities of the South-Eastern District, and the leading scientific and educational institutions, will take part in the entertainment of the Association. The Castle at Dover and National Harbour Works will be open for inspection during the meeting. The first general meeting will be held at the Connaught Hall on Wednesday, September 13, when Sir Michael Foster will assume the presidency in succession to Sir William Crookes, and deliver his Presidential address. On the following evening there will be a *soirée* in the School of Art, and on the Friday evening Professor Charles Ritchet will deliver an address on "La Vibration Nerveuse." The professor next evening will discourse on "The Centenary of the Electric Current." In the Mathematical and Physical Science Section Professor J. H. Poynting will preside; in the Chemistry Section the president will be Mr. Horace T. Brown; and the presidents in the other sections will be: Geology, Sir Archibald Geikie; Zoology, Mr. Adam Sedgwick; Geography, Sir John Murray; Economic Science and Statistics, Professor Henry Higgs; Mechanical Science, Sir W. H. White, Chief Constructor of her Majesty's Navy; Anthropology, Mr. C. H. Read; Physiology, Mr. J. N. Langley; Botany, Sir George King; conference of delegates and corresponding societies, Rev. T. R. R. Stebbing. A special feature of the Association will be demonstrations of Signor Marconi's wireless telegraphy, and the Rev. Mr. Bacon, it is anticipated, will give an address on his recent balloon experiments.

#### SOLILOQUY IN A DARK ROOM.

*Punch* has commenced the publication of a series of soliloquies "recorded by Mr. Punch's phonograph." The first is entitled, "In a Dark Room:—"

"There, everything's ready, I think—developer, 'hypo' water—so out goes the light. Perfectly simple to develop one's own films; far better and cheaper than sending them to Westman's. . . . Night light in my red lamp seems a bit feeble—hope to goodness it won't go out. Now I must unroll the film. . . . Hang the stuff, how beastly curly it is. . . . Wonder if I'm cutting it at the right place? Must chance it. Now then, where's that book of directions? . . . Bless me if I haven't left it downstairs, and, of course, if I open the door now, all the film will be ruined! . . . However, I dare say I can remember most of it. . . . Let's see, was it two parts of 'developer A' and two parts of 'B,' or two of 'A' and one of 'B'? . . . Something's coming already, black spots are appearing on the film. . . . I believe that's Kate, or is it a view of the church? . . . Hello, there's some one—what? eh? *What the dickens am I doing in your dressing-room?* Developing photographs, and I chose it because it has shutters. . . . No, you can't come in. *Time to dress, as you're dining out?* Well, you should have thought of that before. . . . Don't do that, you idiot, you'll burst the door open. . . . *Just what you mean to do!* Oh, nonsense, you'll spoil all my photos—ruin them! . . . Yes, I'll be as quick as possible. . . . Eh? Yes, they're coming out splendidly, *splendidly*. Do go away, please! . . . Confound that fellow Jack, probably he's made me spoil the lot. . . . Wonder how long ago I put this lot in the fixing bath before he came and made that row? . . . But surely I ought to have fixed them first thing? Wish I had that book here. Well, I'll try fixing these before I develop them. . . . Dare say either way will be equally good. . . . Hello, here's another bottle, labelled 'Bromide of Potassium.' . . . Wonder when *that* ought to be used? . . . Let's see, it's a sedative, isn't it? Doctors prescribe it for 'nerves,' so I'll put it in the fixing bath. . . . Wish this red lamp would give more light. . . . I do believe it's going out! It is!! . . . And here I am in pitch darkness, with some of the films fixing and some developing, and—There goes the developer over Jack's hair-brushes! Where are those beastly matches? . . . Thank goodness, I've got a candle lighted at last. . . . I declare, all the film is coal-black, and not a sign of a picture on any of it! And I promised Kate half-a-dozen copies of her portrait! . . . Almost makes me inclined to chuck photography altogether. Any how, if I 'press the button' in future, I'll be jolly careful that some one else 'does the rest!'"

#### THE QUEEN AND THE PHOTOGRAPHER.

A few days ago the newspapers reported the circumstance of a gentleman handing a petition to the Queen while Her Majesty was out driving. The gentleman in question was a photographer, and we are indebted to the *Daily Chronicle* for the following particulars of the incident:—

Mr. Heinrich Schmarr, who carries on business as a photographic artist and jeweller at 3, 4, and 5, Tottenham Court-road, is one of those tradesmen who will soon be dispossessed by reason of the improvements which are very shortly to be made at the western corner of that well-known thoroughfare, and for some time past he has been in litigation with the Council as to the terms upon which his premises should be taken over, the result being a decision in the Sheriff's Court to which he has taken serious objection, although he was awarded compensation to the extent of 1000*l*.

Mr. Schmarr has returned to London after his somewhat exciting experiences at Osborne, and was seen by a *Daily Chronicle* representative, to whom he explained the position of affairs, and the reasons which led him to adopt a proceeding which, however orthodox it may be in the Fatherland, is not regarded with favour in this country. It appeared from his statement that he is a native of Frankfort-on-the-Maine, twenty-six years of age, and that five years ago he took over the lease of the premises he now occupies, expending a sum of 2500*l*. on stock, and eventually working up a business which he describes as of a very satisfactory character. Then the Council came along with a notice to quit, and hence the trouble. All he wanted, said Mr. Schmarr, was to be replaced in a position suitable for his business, but in the end, at a time when he was indisposed, the matter was settled so far as the Council was concerned.

Mr. Schmarr was not, however, satisfied, and, failing any other means of redress, he conceived the idea of placing his case before the Queen herself.

"I went down to Cowes on Thursday last," said he, "and stayed at the Fountain Hotel. On Monday I went to Kingston Cottage, at Whippingham, and prepared a letter to the Princess of Battenberg, which I found I could not deliver. I then wrote one to the Queen, giving both my London and local address, and asking very respectfully that Her Majesty would order further inquiry into my case. I was just returning from a walk when I heard the Queen's carriage approaching, and saw that Her Majesty was accompanied by two ladies. As the carriage came up to me, after passing through one of the gates, I took off my hat and made an obeisance, and said, 'I beg your pardon, your Majesty.'"



At the same time I took the letter from my breast pocket, and was about to hand it to the Queen, when the coachman, being perhaps alarmed, drove on rather sharply, and I had to throw the letter into the carriage. I heard the Queen say, "What is it?" and then they drove on.

"I returned to my lodgings, and it was nearly two hours afterwards that Superintendent Fraser and Detective Force came to me and said a gentleman wanted to see me at Osborne. I asked them was I under arrest, and they said No; I could walk as I liked. At Osborne I had to answer a lot of questions, and it was even suggested, as I was a bit excited, that I should see a doctor. But in the end I was allowed to return home. I had some more interviews next day, and then Mr. Fraser kindly saw me to the pier, whence I returned home. I did not see that there was anything wrong in what I had done, and I was certainly surprised to find from some of the papers that I was supposed to be an Anarchist."

## Our Editorial Table.

### CONVENTION PHOTOGRAPHS.

WE continue to receive photographic mementoes of the Gloucester Convention. Mr. Gerald Bishop sends us a print from a negative of the picturesque old walter at the New Inn. The subject has given opportunity for the making of a capital photograph. Mr. R. W. Dugdale, the local Hon. Secretary of the Convention, favours us with a large number of architectural studies at Gloucester, Tewkesbury, Tintern, Chepstow, and elsewhere. Some of Mr. Dugdale's pictures are of the very highest order of merit, and all evince the possession of an acute perception of what is beautiful in this class of work. From Mr. Fred Marriott come two clever snap-shots taken aboard a rowing boat on the Wye between Tintern and Chepstow. Story-telling is in progress between the two carsmen, who are not unconnected with the photographic press, and the photographs are full of humour. Half a dozen snap-shots taken at Tewkesbury reach us from Mr. G. W. Webster to illustrate the good qualities of the plates he was using. A Convention without a subsequent reminder of it from Mr. T. A. Scotton of Derby would be hard to imagine. Mr. Scotton sends us some exquisite platinum prints of views taken at Berkeley Castle and elsewhere. The technique of these photographs is faultless throughout. All the gentlemen named have our best thanks.

### SAMPLES OF GLASS FOR ORTHOCHROMATIC PURPOSES.

By J. R. GOTZ, 215, Shaftesbury-avenue, W.C.

MR. GOTZ sends us a number of samples of pot-coloured plate glass suitable for orthochromatic and colour photography. Mr. Gotz remarks: "Several pots of the yellow material have been made before, but I have now added other colours, notably red, which has not, to my knowledge, been obtainable commercially up to now. The glass is sufficiently ground and polished to give undistorted images by reflection or direct vision, and, being very thin, there is no perceptible dispersion or disturbance of the image after the light has passed through a lens.

Examined in the spectroscope, one thickness of glass will, in all but the lightest tints, tone down the complementary colour to the one examined, while two thicknesses will practically eliminate it, so that corrections of colour intensities are easily obtained.

A black pot glass may be useful for making unburnishable mirrors. All colours, except the red, may be obtained in plates up to eight inches square; the red at present is four inches square."

### HOME PORTRAITURE FOR AMATEUR PHOTOGRAPHERS.

By RICHARD PENLAKE. London: L. Upcott Gill, 170 Strand, W.

137 pp. 39 illustrations. Price 2s. 6d.

MR. PENLAKE writes with considerable experience of his subject, and his book should be distinctly helpful to the amateur photographer anxious to improve the quality of his "home" portraiture. As a rule, amateur's "home" portraits are deficient in respect of proper lighting and posing. Who has not had to submit to be "taken" by some aspiring beginner, whose capacity for producing a presentable likeness has been sadly overrated by himself and his ignorant friends? We would make it a penal offence in future for the amateur to take at-home—indoor or outdoor—portraits without having studied some such book as that before us. In the course of a dozen chapters the author enters into the subjects of accessories, posing, outdoor and indoor work, artificial light, retouching, &c., and, by the aid of half-tone and diagrammatic illustrations, manages to clearly convey the meaning of his teachings in the practice of non-studio portraiture, &c. Some of the half-tone illustrations are from rather poor original photographs, but the book as a whole is a good and useful one.

### CATALOGUES RECEIVED.

The Tella Camera Company, Limited, 110, Shaftesbury-avenue, London, W.

THIS neatly printed booklet of thirty-two pages is devoted to an exhaustive description of the Tella flat-film camera, and an enumeration of its points, which are as good as they are numerous. Some satisfactory suggestions as to the selection of a hand camera are given, and there are eight phototypic illustrations from negatives taken in the camera, which amply attest its great practicability. The Tella booklet should be in the possession of all hand-camera users.

The British Finishing Company, Teakwood-buildings, Bradford, Yorks.

THE above firm send us their twenty-page list for the trade only. The Company are enlargers in bromide, carbon, platinum, &c.; artists in oils, water colour, crayons, black-and-white, &c.; printers in silver, bromide, carbon, platinum, &c.; retouchers and general photographic finishers to the trade.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, September 6, at eight o'clock. Discussion: "Is Simultaneous Development and Fixation advisable?"

MESSRS. TENNANT & WARD, publishers, of 289, Fourth-avenue, New York, inform us that the first and second numbers of the *Photo-miniature* ("Modern Lenses" and "The Pose in Portraiture") have reached a second edition.

THE Cripplegate Photographic Society opens its next session on Monday, September 4, at seven p.m., when Messrs. Griffin's representative will give a demonstration on Kachin. Applications for membership of this Society should be addressed to the Hon. Secretary, Mr. Alfred T. Ward, Cripplegate Institute, Golden-lane, E.C.

IN reference to Cosmos's Scotch tour Mr. J. B. MacLachlan, of Blairgowrie, writes: "I was greatly interested in his Scottish notes, but, just for fear he may get too conceited about his country, I write to correct a current error he has fallen into. Vardon is not an Englishman, unless you call a native of the Channel Islands an Englishman."—[We certainly do.—EDS. B. J. P.]

THE *Globe* says that some one has taken a snap-shot of Mercier and Billot entering the Court at Rennes together, and it is said that the picture reveals the interesting fact that "Billot is very decidedly looking the other way." The idea of the snap-shottist is a pretty one. Next session we shall hear of photographers catching Sir William Harcourt beaming fiercely upon Sir Henry Campbell-Bannerman, and of Mr. Labouchere looking the other way when Lord Rosebery crosses the lobby. There will be other sensitive developments.

RUSSIAN WEIGHTS AND MEASURES are the subject of a new regulation recently officially published. According to the *Times*, the Russian pound is fixed as the standard of weight and declared to be equal to 409.512 grammes, a pail or vedro is to hold thirty pounds of distilled water at 161° (Celsius), and a garnietz eight pounds of water. The unit of length is the arshin, equal to 71.12 centimetres. The metric system is to be optional, and may be used on a par with the Russian in commerce in dealing with contracts, accounts, &c., and after mutual agreement by State and municipal authorities. Private persons, however, are to be under no compulsion to use the metric system when dealing with the above-named authorities.

ACCORDING to the *Australian Photographic Review* the Photographic Society of New South Wales is to be congratulated on meeting with a ready response from His Excellency, Lord Beauchamp, to accept the position of Patron to the Society. "We have it on the best authority that Lord Beauchamp is an enthusiastic and successful hand with the camera. The fact of having so distinguished a patron, the Society will be encouraged and stimulated to attain to even greater things than they have accomplished in the past." The *Review* also states that Mr. W. Blow, of the Crown Studios, Sydney, has been successful, after a series of experiments, with both the Ives and Joly processes of colour photography, and will be giving a public demonstration shortly.

JAMES YATES is an itinerant photographer, who has been accustomed to take up his stand on Scarborough sands in the summer. Ten years ago his wife, just before she died from cancer, expressed the desire that she should be buried by the side of her mother at Cundall, Thirsk. Being unable, from financial reasons, to have the body conveyed by rail or horse, Yates quietly took it to Cundall on a hand cart, the wheels of which had been improvised from a photographic van. The distance was about fifty miles. This pathetic story of domestic devotion leaked out, and 26l. 8s. 6½d. was collected and presented to Yates. With this he purchased an improved apparatus. Being a steady man, he has since saved money, and he has just handed to the Scarborough Hospital the sum of 21l., and the balance, 5l. 8s. 6½d., to the local branch of the Salvation Army. Teddy Yates, a son, then of twelve years, who accompanied his father on the melancholy journey, is a member of the crew of H.M.S. *Barfleur*, and another son is a soldier. Yates was left with eight children.

DOUBLE SALTS OF SILVER AND COPPER.—P. Sabatier has prepared an interesting series of double salts of copper and silver, obtained for the most part by the interaction of solution of the silver salt and blue cupric hydrate. Thus, the compound  $3\text{Cu}(\text{OH})_2 \cdot 2\text{AgNO}_3$  is obtained in blue-violet crystals from normal solutions of silver nitrate; from hot concentrated solutions another dicupric salt,  $2\text{Cu}(\text{OH})_2 \cdot 2\text{AgNO}_3$ , separates in bright blue acicular needles. With solutions of silver chlorate and blue cupric hydrate a heavy blue precipitate is obtained, consisting of well-formed microscopic prismatic scales having the composition  $2\text{Cu}(\text{OH})_2 \cdot 2\text{AgClO}_3$ . A sulphate of analogous



composition  $3\text{Cu}(\text{OH})_2\text{SO}_4\text{Ag}_2$  is obtained as microcrystalline inclined prisms; another form in needles, containing three molecules of water, also exists. With silver thioisulphate blue cupric hydrate forms the salt  $2\text{Cu}(\text{OH})_2\text{Ag}_2\text{S}_2\text{O}_8$  as a violet flocculent precipitate. Most of these compounds may also be obtained by the action of silver oxide in solutions of the various cupric salts.—*Compt. Rend.*, 129, 211.

We have received from the Hon. Secretary of the Maritzburg Camera Club, Pietermaritzburg, the following syllabus for the present session: September 1, "Platinotype Printing," by Mr. S. S. Watkinson; 15, "Development Papers and Opals," (second paper), by Mr. T. C. Mitchell; 29, "Outing to Edendale," October 6, "Carbon Printing," by Mr. E. J. Kerby; 20, "Enlarging" (first paper), by Mr. F. J. Lewis. November 3, "Lantern Slides, Dry Plates," by Mr. G. Smith; 17, "Radiography," by Mr. A. Allerston. December 1, "Enlarging" (second paper), by Mr. H. N. Johnson; 15, "Lantern Slides, Wet Plates," by Mr. W. Cohen. January 5, "Flashlight Photography," by Messrs. Mitchell and Swete; 19, "Exhibition of Apparatus and Discussion thereon," by the Club. February 2, "Art Principles Applied to Photography," 16, "Indoor Photography," by Mr. S. S. Watkinson. March 2, "Copying Photographs," by Mr. H. W. Armstrong; 16, "Isochromatic Photography," by Mr. T. K. McAlister. April—, *Conversazione*; 14 to 17, "Proposed Outing to Table Mountain. We must congratulate our South African friends on an excellent bill of intellectual fare.

## Patent News.

THE following applications for Patents were made between August 14 and August 19, 1899:—

DEVELOPING APPARATUS.—No. 16,516. "Improvements in Photographic Developing Apparatus." R. HADDAN. Communicated by W. E. Oddie and W. B. Cozzens.

CINEMATOGRAPH.—No. 16,590. "Improvements in and relating to Cinematographs, Biographs, Mutoscopes, and the like." R. A. FRASER.

EXPOSING DRY PLATES.—No. 16,646. "An Improved Method of Shortening the Time of Exposure of Dry Plates Coated on one side for Röntgen Photographs." G. C. DYMOND. Communicated by Voltchm Elektrizitäts Gesellschaft A.G., Germany.

CAMERAS.—No. 16,877. "Improvements in Magazine Cameras." R. E. PHILLIPS. Communicated by H. D. Haight. Complete specification.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
4.....	Cripplegate Photo. Society .....	Demonstration: Kachin.
4.....	South London .....	{ A Flashlight Demonstration. Rinhold Thiele.
5.....	Gospel Oak .....	{ Demonstration with the Society's Enlarger.
5.....	Hackney .....	{ Microscopical Lantern Projection. Messrs. Drake and Dean.
6.....	Manchester Amateur .....	{ Excursion: Conway. Leader, H. B. Bradley.
6.....	Photographic Club .....	{ Discussion: Is Simultaneous Develop- ment and Fixation advisable?
6.....	West Surrey .....	{ Open Night.
7.....	Hackney .....	{ Excursion: Broxbourne Common. Leader, E. T. Coombes.
9.....	Kingston-on-Thames .....	{ Excursion: Wimbledon Common. Leader, T. W. Wilson.
9.....	South London .....	{ Excursion: Back Waters of the Lea. Leader, Mr. Marshall.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 24.—Mr. H. C. Rapson in the chair.

Mr. T. E. FRESHWATER asked how he could remove drying marks from some of his negatives. He explained that he had set up the negatives, after completion, to dry in an ordinary drying rack. After some hours he found the edges dry, but in the centres the moisture from one negative had condensed on the back of the next. He then removed the negatives to where there was a current of air, and, when they were perfectly dry, found markings corresponding to the different rates of drying, which in some cases were very evident on the prints. He was recommended to give the negatives a prolonged soaking in plain water and to place them to dry where the drying action would be uniform.

Mr. Freshwater said that a negative had been shown to him in which there was what appeared to be an insensitive round spot. On his suggesting that a drop of water or some solution had fallen on it or the plate at some time, the photographer remembered that, while changing plates in a strange dark room, one or two of the plates had become splashed with water from the tap. He had put aside those he had noticed were splashed, but this one must have passed unnoticed.

Mr. A. MACKIE said that with washed collodion emulsion plates, if the drying were commenced rapidly and continued slowly; for instance, if, after coating, the plates were stood on a shelf in the dark room, and, before drying was complete, were put in a rack box, a distinct mark where the drying had been checked always showed.

The CHAIRMAN said the explanation given, in his absence at the last meeting,

of the cause of the defect in the hand-camera negatives shown by him a fortnight ago was not the correct one. He used a magazine hand camera, the plates, after exposure, falling to the bottom of the camera box, which was of wood and blackened. In the centre of the bottom was a disc of brass covering the tripod-screw socket. It was only the first plate exposed which showed any defect, and this was due to the emanations from the wood or the substance used for blacking it, which had caused general fog. The circular spot, where the negative was perfect, occurred where the plate was over the brass disc.

Mr. J. W. HODGES passed round two negatives. They had been in the two sides of the same dark slide. One had, by accident, received two exposures and the other none at all. The plates had been developed, &c., as usual. The latter showed no image, of course; but it was densely fogged everywhere except where the fabric forming the hinge of the shutter covered the plate. In the former the negative seemed to have developed normally except where the hinge of the shutter occurred, and there a band of fog appeared. The action in the one case seemed just the opposite to that in the other.

No one present had any explanation to proffer.

Mr. Hodges also passed round a print on collodio-chloride paper. It had been left in the printing frame and exposed to light for about nine hours, that is to say, about eighteen times as long as was necessary to make an ordinary print. The print showed the subject as a negative. In the shadows, or more transparent parts of the negative from which the print was made, the silver of the paper, under the prolonged action of light, had been reduced in a grey form resembling the reduced silver on a wet-plate negative, and, where the lights or dense parts of the negative had to some extent protected the paper, the reduction was of the usual dark-brown tint.

### PHOTOGRAPHIC CLUB.

AUGUST 23.—Mr. J. W. Mason in the chair.

Mr. E. W. FOXLEE said he had been experimenting with gelatines, and had secured one very striking example, showing the power of a coating of gelatine on a glass plate. He had coated a glass plate with a thick layer of gelatine and allowed it to dry, and the result was that, when the dry film was sprung off, it brought with it flakes from the glass plate. With the ground-glass plates for the collotype process he had often seen very peculiar effects produced in this way, but in this case the ground surface and the substratum used tended to bind more with the gelatine than did the polished surface of the glass used for drying the gelatine upon for his experiments. Different gelatines, he found, produced different characters of splitting, a tough gelatine, for instance, having a distinctive action to that of a brittle gelatine.

The application of this property of the gelatinous bodies to commercial purposes for the production of designs upon glass articles was referred to in the comments which were made upon the specimens passed round by Mr. Foxlee.

Mr. F. Dundas Todd, now visiting London from the United States, was welcomed by the Secretary on behalf of the members, and there ensued a conversational discussion upon the general qualities of several of the newer developing agents.

North Middlesex Photographic Society.—August 21, Mr. H. W. Bennett in the chair.—Mr. F. L. PITHER gave a lecture, entitled,

WHAT TO PHOTOGRAPH, WITH HINTS ON COMPOSITION.

The lecturer said that, in painting, the individuality of the operator influenced the result. This to a great extent was impossible to photographers, but was in some measure attainable; also, painters generally had a definite idea in view. You should determine what pleases you, and aim for that result in your working. The lecturer gave a few rules as to the placing of the principal objects in the picture, and also said that very often the standard sizes of plates did not give the best shape for the picture. He suggested the size 8 to 1, instead of the usual 1 to  $\frac{1}{2}$ ; very often, he said, it would suit the subject better (the lecturer confined himself to remarks on landscape). A good definition of breadth was that it was the reverse of spottiness. The half-tones were the making of a picture, and, for this reason, do not print on absolutely white paper. To illustrate his remarks, he made rough sketches on the blackboard and also referred to a number of engravings hung on the walls. In reply to a question from Mr. MUMMERY as to the position of a principal object in one of the engravings, and as to whether in the original picture the colour had supplied the deficiency? Mr. PITHER said that in treating of colour all these rules relating to black-and-white work went for naught. A painter could balance his picture by making one part warm in tone and another cold, leaving form out of the question. Replying to a question of Mr. LIVETT as to a remark he made about "complexity of focus," the lecturer said it is having two points of light in strong competition. Mr. Pither replied to several more questions, and a very entertaining and instructive lecture was brought to a close.

### FORTHCOMING EXHIBITIONS.

- 1899.
- Sept. 22-Nov. 4 ..... Photographic Salon. Hon. Secretary, R. W. Craige, The Camera Club, Charing Cross-road, W.C.
- " 25-Nov. 11..... Royal Photographic Society. Hon. Secretary, Colonel J. Waterhouse, 12, Hanover-square, W.
- October 18-24 ..... Croydon Camera Club. Hon. Secretary, W. H. Rogers, 106, Holmesdale-road, South Norwood.
- " 22-Nov. 19... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.



Nov. 27-Dec. 18 ..... American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.

December 7-9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Correspondence.

\* \* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### COPYRIGHT.

To the EDITORS.

GENTLEMEN,—May I point out to you a glaring piece of piracy of one of my pictures, the late —, by Messrs. —, of London? Some eighteen months ago I was requested to take a group of three generations. I took this, and subsequently got orders for about thirty dozens. I also took on my own account a large head and shoulders photograph of —, and sent the family a few copies for which I did not charge. Some six months or so after, the old gentleman died, and the family ordered about two dozen *cartes-de-visite* of this photograph, and purchased an enlargement I had done on my own account. I did not copyright at the time, but subsequently registered the photograph. Some three months or so ago, was told there were some reproductions of my photograph about the town, and that they were marked proof, and were selling one guinea each. For some weeks I tried to come across one, and also name of firm reproducing same, but did not succeed; but a framer told me he had framed twenty or thirty. Three weeks ago I saw one; it just had "proof" on, no name. I asked Mr. — if he knew anything about it, he said Mr. — asked him if he might make a drawing from the photograph, and thinking there was no harm in it, and not knowing I had registered the photograph, he gave permission, and subsequently purchased some, and gave to his officials. I next wrote to Messrs. — and told them I had come across their reproduction of my picture, which was an infringement of my copyright, and stated that they might have had the courtesy to acknowledge same, and should be glad to receive reply hereon. Mr. —, in reply, stated that he had received permission from Mr. —, therefore he could not understand the meaning of my letter; he applied to me without Mr. —'s permission, he certainly would have asked whether I objected to his making use of my photograph, but, as matters stand, he declined to make himself responsible. He further stated that, owing to my photograph being in the market, he did not dispose of half a dozen copies, and, in consequence, had suffered great loss, and had destroyed plate months ago. I wrote Mr. — on the subject, and, in reply, he says: "I think you are quite right in taking up with Messrs. —, but I would not like you to take extreme measures." After this, of course, I can do nothing, as Messrs. — are very good customers of mine. Mr. — alone took twenty copies of this picture (—'s), and gave same to his clerks' foreman, &c. I wrote Messrs. — and told them they were certainly liable, and that I knew he had supplied twenty copies to Mr. —, but I presumed the five or six they mention would be in addition.

I had several inquiries about my three-guinea enlargements of my picture, and, on the strength of two promises, made two, which I still have by me; those who were going to purchase cancelled their order—they have —'s reproduction.

I suppose mine will be one of very many similar cases brought to your notice.—I am, yours, &c., J. G. G.

### THE CAMERA CLUB EXHIBITION.

To the EDITORS.

GENTLEMEN,—Mr. Maclean, in your issue of the 25th inst., desires to excuse his slovenly criticism in the *Camera Obscura* of the Camera Club Members' Exhibition.

As he commences with an imputation of motives against the Editor of the JOURNAL, it would be perfectly justifiable that his communication should be treated with contempt; however, as this is probably to be attributed to defective education, we must be a little charitable towards him.

Taking his paragraphs *seriatim*, he firstly complains of the want of a catalogue, a most unfortunate remark for him; the writer observed an evident representative of some periodical making notes on a sheet of paper, and remarked to a fellow-member that it was strange the critic should not avail himself of a catalogue of which there were several lying

at the disposal of visitors on the tables in the Club-room, he was subsequently told on inquiry that the visitor was Mr. Maclean.

No absence of catalogue nor any other reason can excuse a critic who, quoting the actual number of a frame containing a landscape picture, proceeds to criticise it adversely as a portrait by a Mr. Beard, who has no portraiture exhibited here.

Mr. Maclean is desirous of throwing his responsibility on Mr. Craigie. Certainly, when I observed Mr. Maclean in the Club-room for a considerable time, he was alone, and Mr. Craigie informs me that he cannot remember having enjoyed the pleasure of a personal introduction to Mr. Maclean, and he has no recollection of having shown any stranger round the walls of the Exhibition, and was also unaware until quite recently that Mr. Beard figured as one of the exhibitors. It therefore seems, to say the least, unlikely that he should have misled Mr. Maclean in the manner stated in his letter.—I am, yours, &c.,

THE WRITER OF THE REVIEW IN THE  
CAMERA CLUB JOURNAL.

Camera Club, Charing Cross-road, W.C., August 26, 1899.

## Answers to Correspondents.

\* \* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

G. W. French, Church-street, Wiveliscombe.—Photograph of a cat with wings.

A. Coupe, 48, Wilmslow-road, Withington, Manchester.—Photograph of three boys playing nap.

R. Spurr, South Cliff, Bridlington Quay.—Photograph of Colonel Bridgeford and officers of 2nd V.B. Manchester Regiment.

F. DOWDALL.—The temperature of the developing solution was too high. We have ourselves produced the effect seen in your negatives by such means.

MEDRINGTONS, LIMITED (Liverpool).—Thanks for the print and note, which we have returned. It is a very common case of "mystery photography," of which we possess numerous examples that defy explanation on ordinary grounds.

SENSITISING POST CARDS.—ROGO says: "Could you please say is there any method of sensitising post cards so as to print by artificial light?"—The only thing we can suggest is to coat the cards with a gelatino-bromide emulsion, and, after exposure, develop as bromide papers are developed.

WET-PLATE POSITIVES IN STUDIO.—WET PLATE asks: "Shall be glad to know if it would be possible to do wet-plate positives in studio by flashlight? Am using an old-fashioned Voigtlander lens, without stops. Particulars would much oblige."—Yes, certainly; but a larger quantity of the powder will have to be employed than is the case with gelatine plates.

LESSONS IN MINIATURE PAINTING.—N. W. D. says: "Could you kindly inform me of a reliable photographic artist where I could get lessons in miniature painting and working up black-and-whites? I should like, if possible, to get some one within easy distance of Clapham."—Better consult our advertisement columns. It is strictly against our rule to give an opinion of any particular advertiser's wares or qualifications.

TRANSPARENT LINES ON NEGATIVE.—AJAX says: "Can you tell me the probable cause of the fine transparent lines on the right-hand side of the enclosed negative. The negative is on a Hill-Norris dry-collodion plate, and has been intensified by Monckhoven's process. These lines do not appear until the negative has dried."—The lines are cracks in the collodion film, owing to its contraction while drying after intensification.

COPYRIGHT.—PROF. PHOTOGRAPHY says: "I bought a photograph in London produced by a Parisian photographer. 1. Have I the right to copy same? 2. To make enlargements? 3. Could I sell the same? The photograph is not registered copyright."—1. No, as probably the picture is copyright in France, consequently it is copyright here under the International Law. 2 and 3. Certainly not if the work is copyright.

STAINED VIGNETTES.—H. J. complains that many of his vignettes, of which he sends samples, are stained in the whites. He says that every care is taken in the fixing and washing, and that the stains do not show in prints that are printed solid. The stains proceed from the mounts. The dark surface is partially soluble in water, consequently the moisture in the mount softens it and thus stains the back of the print, and the stain shows through the paper.

PATENT QUERY.—S. P. writes: "I saw a description of an apparatus in one of the back volumes of THE BRITISH JOURNAL OF PHOTOGRAPHY. I have very much improved upon it. Can I now patent it, so that no one else can make it?"—No; but you can patent your improvements upon it, setting forth in the specification distinctly what they are and what you claim as the improvements. Of course, any one will still be at liberty to make the thing as it was described in the JOURNAL.



**FORM FOR SITTERS.**—LANCASTRIAN says: "Would you please write out a form for sitters to sign when the photographs are copyright? I have written several out myself, but they have not been satisfactory to me, and so would be glad if you would suggest one."—In reply: Send us two or three of those you have already written out to see. Probably any one of them is all that is required. If you join the Photographic Copyright Union (see p. 639 of the ALMANAC), which will cost you nothing, the Secretary will possibly supply you with printed forms.

**STUDIO BUILDING.**—CLARIONETTE says: "I am desirous of building (in portable sections) a studio about 18x9 feet in a garden 75x19 feet. I should like to know what regulations there are to be considered. Would plans have to be submitted to district surveyor, and what are the fees, if any? The district is under the Croydon Corporation."—We presume that plans would have to be submitted, but we are not conversant with the by-laws of the Croydon Corporation. Better consult the district surveyor before commencing the work. It may save you a deal of after-trouble and perhaps expense.

**PHOTOGRAPHS OF AN ESTATE FOR SALE.**—A COUNTRY PHOTOGRAPHER writes: "A solicitor here is interested in the sale of an estate, and wants me to take a number of photographs of different parts of it. He says the estate agents told him to instruct the photographer to make the grounds, &c., to look on as large a scale as possible. But how is that to be done?"—Use a lens that will embrace a tolerably wide angle, so that the perspective becomes somewhat violent. In this way, with a very wide-angle lens, a duck pond may be made to look like a small lake, and moderate-size grounds extensive ones.

**COPYRIGHT.**—MIDLANDS writes: "A photographer in this place took some photographs—views of old buildings of interest which are now pulled down, and I know that he made them copyright at the time. He has recently sold this business, and negatives, including these, to the new-comer, and I don't believe—in fact, I know—that the copyright in these has been legally transferred. Am I not at liberty to copy them for sale?"—No; certainly not. If the copyright has not been legally assigned, it is still vested in the one who took the pictures, and he would, no doubt, proceed against you for the piracy.

**OWNERSHIP OF NEGATIVES.**—J. H. V. WATTS says: "Some time ago I was instructed to photograph an old cross in this neighbourhood, for which I received the sum of 10s. 6d. I exposed two plates and delivered two prints. I also made a lantern slide from same, for which I was paid. Now the gentleman for whom I did this work claims the negatives also. Would you kindly answer me as to whether I am the owner of those negatives or not?"—In reply: Yes, the negatives are yours. You contracted to supply prints and lantern slides only, and therefore your client can have no claim upon you for the negatives.

**STAINS ON NEGATIVE.**—HAROLD says: "The enclosed negative is a specimen of a trouble the like of which (although an operator of vast experience in dry plates for over twenty years) I have never seen before. These markings have occurred during the hot weather, and make their appearance during development. I first put it down to allowing developer to remain perhaps a moment on plate while examining it, for it is at this moment these marks appear. Could you, sir, help me out of this trouble?"—The stains appear to be due to carelessness in handling the plates either before or after exposure. One of them bears unmistakable evidence of a finger or thumb mark, probably when the finger was moist with perspiration.

**COPYRIGHT.**—S. says: "To make a lantern slide for my own use, I purpose copying an etching which appeared in a French art journal in 1873. The painter of the picture died over twenty-five years ago. After this lapse of time can the copyright be vested in anybody, and, in making such slide without permission, would there be any infringement on my part?"—If the etching is still copyright in France, it is, under the International Copyright Act, copyright here, and it would be illegal to reproduce it here. The duration of copyright is different in France from what it is in this country. We, personally, are not familiar with the French copyright law. Perhaps some correspondent who is will enlighten the querist.

**STUDIO-BUILDING.**—COLOUR says: "I am erecting a photographic studio; it is well lighted from north. The sides and ceiling are lined with wood. Enclosed are twelve patterns of colours, each numbered on the back. Would you kindly say which number of colour would be most suitable to paint studio walls for purposes of photography? My preference is for colour No. 7, next No. 6; but these colours might not be suitable; if not, would you kindly say which is the right colour? And, again, as to studio curtains, which number of colour would be most suitable for them?"—No. 7 would be a very suitable colour, but we should prefer a little more blue and rather less yellow in it. As for the curtains, No. 10 will be about the most suitable of the fabrics sent.

**CURLING OF COLLODION PRINTS.**—A. C. STRUTT says: "I should be much obliged if you would answer the following question in your next issue. Do you know of any means of preventing collodio-chloride papers from curling up during the operations of washing, toning, and fixing?"—Different plans are recommended for avoiding this trouble with those brands that give it. One of the best is to fill a dish with water, to the depth of half or three-quarters, for the first washing. Place the dry prints face downward in this, one by one, and keep them flat. When all are immersed, draw the bottom one out and lay at top, and so on with the rest. After five or ten minutes of this treatment the prints will have but little tendency to curl. In obstinate cases tolerably hot water may be used in place of cold. If the prints are prevented from curling at the initial stages, they have little tendency to curl afterwards. A solution of alum has been recommended to be used before the prints are washed, but we do not advise its use.

**VALUING A BUSINESS.**—M. L. says: "I should feel obliged if you could inform me upon what basis a photographic business of considerable standing is usually valued. Is it customary to base the estimate upon so many years' purchase of the profits; and, if so, for what period? I quite understand that the stock in trade is taken on a separate valuation, but am doubtful as to the value of the goodwill. I may add that the business is under the direct personal supervision of the principal."—This is a difficult question to answer, as so much depends upon local circumstances—amount of opposition in the neighbourhood, situation, status of the business, amount of returns, prices, length of lease, &c. Perhaps some correspondents will give their ideas on the subject.

**COPYING A COLLODION POSITIVE.**—F. C. says: "I have had sent for copying an old collodion positive. This has gone yellow round edges, and by reflected light it is rather weak-looking. However, I think that everything is in it, and it could be restored; but, as I do not at all understand wet collodion, I should be pleased if you would help me. 1. How shall I proceed to restore the vigour to the positive itself? 2. How would you advise me to make my copy, by reflected or transmitted light? Of course it is a negative by transmitted light."—In reply: 1. Better not tamper with the picture, as in all probability the collodion has become somewhat rotten. 2. Whichever way will yield the best results, and that, of course, we could not give an opinion upon unless we saw the photograph.

**COLLOTYPE PRINTING.**—SABETA says: "I wish to take photographs similar to the enclosed. Could you kindly be of some assistance to me in giving me a few hints as to how to produce them? What particular make of paper to use, and how to produce the black border with name at bottom? I believe it is all done with one exposure on the negative, and that they can be turned out by the hundred very quickly. You might also say how to dry them flat with the fine surface."—The print sent is made by the collotype process, probably printed in a power machine, and glazed with an aqueous solution of lac afterwards. Any work on the collotype process will give you all the desired information. Schnauss's work is a good one. It may be had through Messrs. Dawbarn & Ward, Penrose & Co., Iliffe & Co., or any bookseller.

**GELATINO-CHLORIDE PRINTING.**—H. M. says: "I have been making some gelatino-chloride paper by the formula given by Woodbury, viz.: Water, 8 ounces; silver nitrate,  $\frac{1}{2}$  ounce; Rochelle salts, 20 grains; ammonia chloride, 10 grains; alum, 50 grains; citric acid, 1 drachm; gelatine, 1 ounce. I get good prints and nice tones, but when the prints are drying they go quite dull, although much of the brilliancy returns when quite dry. Can you tell me the reason why this is so, and how it can be avoided? I use Nelson's No. 1 gelatine mixed in equal parts with Coignet's Gold Label. I enclose samples, also a finished print on the paper."—Possibly it may be due to the surfaced paper upon which the emulsion is spread. Try another sample of the raw paper. However, the print sent is very good, and we think more gloss would be offensive to most persons. It is about the average gloss of most P.O.P.'s that are not squeezed on to glass.

**BACKGROUNDS. DEVELOPMENT WITH METOL.**—SEVERN SEA asks: "1. Can you advise me of the best way to attach a canvas background to a hollow tin roller? 2. Also, in developing bromide paper with metol, what is the plan usually adopted in the matter of fixing? If each print is washed and then put in water, the lights get degraded, while other prints are being developed, and, if they are washed in water and then put in hypo as developed, how can equal and perfect fixation be assured?"—In reply: 1. Stitch a piece of stout calico tightly round the roller, leaving an inch or so free; then give it a coat of thin glue. Sew the end of the background to the free piece. 2. Necessarily, the development goes on, to an extent, while the prints are in the water. They should be put into the hypo at once after washing, and each given the same time in the solution; then equal fixation will, of course, be secured in all the prints. Employ a good quantity of the solution.

**ADHESIVES, &c.**—H. C. says: "I should be greatly obliged if you would answer the following queries: 1. What is the best adhesive for mounting glazed prints (I have always been used to burnishing before. I use Le Page's fish glue at present, but wonder if it is injurious to them), and how is dextrine made for use? 2. What is a fifty-grain solution? I notice it in the ALMANAC and recently in the JOURNAL, but cannot understand the term. The following may be of interest to you: I was recently spotting and blocking out a machine, and picked up a penholder in mistake for the brush. I instantly saw my mistake, but the incident caused me to wonder why a pen would not do for the purpose. I put the idea in practice, using a 'J' pen nib, and putting the opaque on the pen with a brush, and found it to work excellently; in fact, I had outlined the machine almost before I knew it. I should think a quill pen would work better, but have not tried it. The pen being hard, one has complete control over it, and avoids shaky lines and straining of eyes, of course. I go round the outline with the brush after, as the pen leaves only a very thin line. Another thing I find useful when the vignetting frames have been caught in a shower is to apply a piece of blotting-paper (under the vignettted) to the glass, which will instantly absorb all spots in a quarter the time a cloth will, and without disarranging the cotton-wool, &c. I have just opened a business at above address, and built a studio as recommended by Messrs. H. P. Robinson and J. Inglis (single slant). It is 28x15 feet, and seems very handy."—In reply: 1. We should prefer either starch paste or a thin solution of gelatine, which is free from acid, such as Nelson's No. 2 soluble. Simply stir the dextrine in cold water till dissolved. We should not advise its use, as commercial dextrine is almost invariably acid. 2. A fifty-grain solution is one that contains fifty grains of the salt, whatever it may be, dissolved in an ounce of water.



# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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## THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1900.

Edited by THOMAS BEDDING, F.R.P.S.

THE thirty-ninth annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1 next. Its preparation is already receiving attention. This year's ALMANAC reached a total of 1508 pages, and the entire edition of 20,500 copies was sold out within about three months of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past ALMANACS have been received is the surest proof that the lines upon which that publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1900. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the ALMANAC in directions which may occur to our readers as susceptible of improvement.

The ALMANAC for 1900 will appeal to photographers all the world over as a daily reference guide in practical work. The formulæ will be revised where necessary, and the latest de-

partures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages of the 1900 ALMANAC. Those of our friends intending to co-operate with us in this respect will oblige us by letting us have their MS., sketches, &c., at the earliest possible date.

Secretaries of societies will also oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us as early as possible.

The publishers ask us to remind advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

## EX CATHEDRÂ.

THIS is the season of the year when learned institutions, such as the British Association, professional combinations like the Journalists' and the Naval Architects, and industrial societies such as the Trades Union, take holiday in the country and meet in congress, there to combine the pursuit of pleasure with the discussion of scientific or business affairs of common interest. The Photographic Convention, as is well known, is a law unto itself in this matter, for it prefers not to wait for the holiday months of August or September, but holds its country festival each year in the early part of July. The American Convention is in a line with its British contemporary on this point, and we observe in our Transatlantic exchanges full reports, which, in some cases, extend to thirty or forty pages, of the things that were done at the Celeron meeting, which took place two months ago.

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THOSE of our readers who have attended a British Convention will the more easily perceive the difference which exists



between the conduct of that body and the American gathering if we briefly indicate the salient features of the last meeting of the American Convention at Celeron. Only professional photographers, the manufacturers, and dealers appear to have attended the meeting; the amateur and the scientist seem to severely stay away from American Conventions. The social programme was a full and varied one. There was an excursion and "clambake" (will some American reader kindly tell us what a clambake is?) given by the dealers and manufacturers, an informal "hop," a theatre party, a grand ball, and feast of lanterns, given by the citizens of Jamestown, and other festivities. Evidently the American Conventioneers "do themselves" exceedingly well.

An exhibition of professional work, in which the leading men of the American continent competed, was held during the Convention, and something like sixty awards were made. There appears to be a keen desire to secure a recognition at the hands of the Judges at the American Convention. The business meetings were taken up largely by discussions on matters of interest affecting American professionals as a class, and there was a little art talking, which probably sounded better than it reads. In another part of this week's JOURNAL we give extracts from two discussions which took place, and which sufficiently indicate the tenour of the formal proceedings. On the whole, it appears to us that the American Conventioneers must have a profitable as well as an enjoyable time. They play hard, it is true, but they all appear to be animated by the wish to help and learn from one another, and, if we may judge by what we are told and what we read, the annual Conventions of the Photographers' Association of America, as well as similar but smaller gatherings which are held in individual States, must be productive of a large amount of good to professional photography in the United States.

THE new photographic telescope constructed for the Potsdam Observatory is now complete, and the opening ceremony took place on Saturday, August 26, under the auspices of the German Emperor. The object-glass, aperture 80 cm. (about 31½ inches), is the work of the well-known opticians, Messrs. C. A. Steinheil Söhne, of Munich. The fellow instrument for visual observation, with an aperture of 50 cm. (about 20 inches) was made by the same firm. The Emperor has bestowed the order of the Red Eagle upon Dr. Rudolph Steinheil, the present head of the firm, in recognition of the excellence of his work. We expect shortly to give our readers further particulars of these instruments.

A STRIKING tribute to the value of radiography in medicine and surgery was recently paid by Dr. C. Mansell Moullin, a former President of the Röntgen Society. He points out that the fluorescent screen has now reached such a degree of perfection, that with suitable apparatus the minutest movement of the heart and lungs, and the least change in the action of the diaphragm, can be watched and studied at leisure in the living subject. There is scarcely any change in connexion with the lungs and heart and great vessels which cannot now be seen and photographed, scarcely a disease of the chest or of the organs which it contains, concerning which the most valuable information cannot be obtained. To such an extent has the

fluorescent screen been improved, and so easy has investigation with it been made, that it is probable that some day the examination of a patient's chest with it will be considered as much a matter of routine and as little to be neglected in all doubtful cases as an examination with the stethoscope is at the present time. Valuable as are the indications given by the ophthalmoscope in obscure diseases of the brain, they are not to be compared with those which can be obtained by systematic and skilled use of the fluorescent screen in diseases of the heart and lungs.

It is furthermore stated by Dr. Moullin, whose observations are summarised by *Nature* last week, that the benefit which surgery has derived from the improvements which have been effected in the use of the Röntgen rays during the past year is no less striking than that gained by medicine. As might be expected, the largest proportion and the most striking cases have been furnished by the injuries and diseases of bones and joints. With a well-lit fluorescent screen the nature of an injury can be seen at once, and, what is even more valuable, it is no less easy to ascertain whether a fracture is properly set or a dislocation completely reduced. If the screen is of service to physicians in the diagnosis of intra-thoracic disease, the records of the past year have shown, by numberless instances, that it is no less valuable to surgeons, by enabling them to make sure at a glance that the bones are in their proper relative situation without touching the splints or giving the patient a moment's pain. It will be seen by these observations that the earliest anticipations of the probable value of radiography in surgery and medicine have been fully realised.

THE *Scientific American*, in a recent issue, contained some remarks on accuracy and style in scientific writing which may be commended to the particular attention of that very large number of photographers who record their experiences in print. In no profession, not even in *belles-lettres*, points out our contemporary, is the art of literary expression of such pre-eminent importance as in scientific writing. So much depends upon the accurate use of words, and upon the manner in which they are grouped to convey the author's ideas, that it is surprising how little attention is paid by a large proportion of the writers of scientific articles to literary technique. No doubt, much of the difficulty experienced by the average student in mastering some apparently obscure scientific exposition is due to the author's inability to express himself with that clearness which is so essential to all forms of good writing. Popular science, in the opinion of many, is often a poor kind of science, but it owes no small share of its popularity to the perspicuity and simplicity which has characterised the style of its writers.

No man has greater need of a masterly command of the technique of his language, proceeds our contemporary, than the scientist. He should devote much of his time to analysis in the verbal laboratory, as well as in the chemical and physical, in order that he may habitually select his words and frame his sentences with a careful regard for their fitness to convey exactly and lucidly the thought in his mind.

THE novelist or the essayist undoubtedly has an advantage over the scientific writer, in so far as his subject is apt to be



lighter, more easily followed, and perhaps more fascinating to the average reader. The mental effort of glancing through a novel or light magazine article is less than that of reading a treatise on stellar chemistry or biology; but it is within the power of a brilliant stylist, like Huxley, to render the effort pleasurable, even though the subject-matter be abstruse or, in a popular way, unattractive. The inaccurate use of a word in the one case has but little effect upon the context, and, indeed, may even be unperceived by the reader. In a scientific article, on the other hand, an expression carelessly used may render a whole passage obscure, or completely distort the meaning of a sentence. Hence, as some one has cleverly said, the aim of writing, and especially of scientific writing, is not that one may be understood, but that one may not be misunderstood.

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A GLANCE at our Patent intelligence this week will show that, of the applications there recorded, no less than five are connected with film photography. This may be taken as an indication that the matter of flexible films for photographic purposes is receiving considerable attention at the hands of inventors, especially when viewed in conjunction with the circumstance that two new gelatine stripping films have recently been publicly demonstrated before photographers. It is eighteen years or more since flexible gelatine films were first placed on the market, so that it argues considerable faith in their possibilities on the part of modern inventors and patentees when we find the latter still busy with the subject in the present year of grace.

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THE characteristic energy of the Leeds Camera Club, one of the most useful and hard-working photographic societies in Great Britain, has manifested itself in a new direction by the publication of a syllabus and hand-book for the session 1899-1900. Within the compass of a neatly printed and bound volume of 64 pages a list of the Club's officers, the rules, and particulars of competitions are given, and there are over twenty pages of informative articles on choice of subject, exposure, developers and development, printing processes, gelatino-chloride printing, platinotype, carbon and bromide; but it makes us rub our eyes to note the following belated commendatory reference to the extinct gum-bichromate process: "The gum-bichromate printing process is one for the few, and must not be judged by ordinary photographic standards. A successful result is most satisfying, but in any event the pleasure of trying it and even failing is not altogether disappointing. Wide as it is in its opportunities for control and modification, the working of it yields a splendid study in tone values—not the safest part of a photographer's education."

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FOURTEEN pages of the book are set aside for particulars of the syllabus, in which the names of J. Craig Annan, A. Horsley Hinton, Dr. Llewellyn Morgan, J. W. Wade, T. Morley Brook, T. Manly, J. Bushby, Harold Baker, W. E. Tindall, and others find place as lecturers on interesting subjects during the session. Thirteen portraits and biographies of these gentlemen are given, and the photographs and reading matter are interesting, and, in the latter regard, sometimes amusing. By way of frontispiece to the book there is printed a speaking likeness of the accomplished President of the L.C.C., Mr. W. J. T.

Warren, whom, with his coadjutors, we heartily congratulate on the production of a unique volume in the way of photographic society literature. And to these congratulations we add our best wishes to the Club for a successful session.

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WE understand that the arrangements for the whole of the Lantern Exhibitions for the British Association meetings at Dover next week are to be carried out by Messrs. Newton & Co., of Fleet-street.

#### PERMANENCE OF THE BROMIDE PROCESS.

At a recent meeting of the Photographic Club a very important topic was discussed—"The Permanence of the Bromide Process." This is a subject that is of paramount interest to every photographer, for without question this process is more extensively employed for enlargements at the present time than any other. In fact, it may safely be said that, although the bromide process is of comparatively recent date, there are already more bromide enlargements in existence than there are by all the other processes put together. We mention this merely to illustrate the importance of the subject, for it stands to reason that the public do not go to the expense of an enlargement, however low the price may be, and the cost of a frame for it, unless they expect to get a lasting picture. Therefore it is to the credit of photography and photographers that they get it, and are not supplied with a result, however good it may look at first, that will change in the course of a few years. There is no gainsaying the fact, however, that many bromides have done so, and in even less time than that. But is it the fault of the process, or of those who made the pictures?

The gelatino-bromide process on paper was invented and patented by Mr. J. W. Swan in 1879, consequently it is just twenty years old, and it was worked commercially shortly after its introduction. Therefore it has been sufficiently long in use to test its permanency, or, at least, to the extent of about twenty years; and, if a photograph endures unchanged for that period, it may be fairly assumed that the process by which it is made is not a fugitive one. Gelatino-bromide pictures are in existence, without change, that were made in the earliest days of the process. At the same time it must be borne in mind that there are hundreds of others that have become of a sickly yellow, though we have not yet come across any that have actually faded—the image itself disappeared. This tends to show that it is to the gelatine or the paper—or probably the two combined—that this change is to be attributed.

As some pictures have changed, while others have not in the least, it seems to indicate that it is certainly not the fault of the process, but of those who work it, and with them solely rests the reason for the deterioration. It may, therefore, be well just now to inquire as to the probable cause or causes why some pictures have undergone change. We have frequently seen the process worked on a commercial scale in different houses, where the ferrous oxalate was the only developer employed. This was always used in a more or less acid condition, and, after development, the pictures were immersed in a bath of dilute acid. Then, after a meagre washing, sometimes a mere rinse, they were put direct into the fixing solution. Now, under these conditions, the prints, of course, contain a considerable amount of free acid at the time they



are put into the fixing bath, with the result that the hyposulphite of soda is decomposed, and sulphur and sulphurous acid are set free—to say nothing of complex silver compounds—both in the gelatine film and in the paper. Under such conditions as these it is not at all surprising that some bromide pictures do, after a time, show a change; indeed, it would be more extraordinary if they did not. But this deterioration clearly must not be attributed to the process.

Here is another cause, and a fertile one too, to which a change may be attributed, namely, imperfect fixation. Many photographers, when a silver print fades, put down the cause to imperfect washing; but we unhesitatingly say that, in the majority of cases, both with developed and printed-out pictures, it is more due to faulty fixing than to faulty washing. When a photograph is placed in a solution of hyposulphite of soda, the first action of the latter is to convert the bromide or chloride of silver, whichever it may be, into hyposulphite of silver. This, with excess of hypo, forms a double salt, which is practically insoluble in water, though it is freely soluble in a large excess of hyposulphite of soda. Now, it is very obvious that, if this large excess is not present, the whole of the double salt is not brought into the soluble condition, and therefore no amount of washing will remove it. The hyposulphite of soda may be removed by washing, but not the silver compound that remains in the paper and gelatine to hereafter work mischief, particularly if the pictures are exposed to adverse conditions—moisture, prolonged exposure to light, &c., as witness many gelatino-chloride printed-out pictures. If a print is thoroughly fixed, a comparatively short washing will suffice, because the salts in the picture are in a soluble condition; but, unless they are so, it is practically impossible to eliminate them with any reasonable amount of washing.

We shall probably, at an early date, recur to this subject and give some practical hints upon it, for we say unhesitatingly that, when worked with due precautions, the gelatino-bromide process is one of the most, if not *the* most, permanent of all silver processes.

**Lightning Photographs.**—Some attention has lately been given to this subject, and, in the columns of *Nature*, have been published letters from Lord Kelvin, and Dr. W. J. L. Lockyer referring to personal experiences in connexion with a non-photographic phenomenon which apparently has its exact analogue in published lightning photographs—the appearance of “black flashes.” These observers, however, explained the cause of the presence of their flashes as being entirely subjective; fatigue images on the retina of flashes seen immediately before, and hence visible as dark objects whenever the gaze, within a second or two of time, was directed to a lightning-illuminated picture of the sky, the eye remaining stationary for a moment. The explanation is, of course, correct for the occasions referred to; but it cannot by any means be allowed to stand as a sufficient explanation for all cases, for the very simple reason that photographs have been, from time to time, taken in which dark flashes have been perfectly visible.

MUCH speculation has been caused by the phenomenon; many theories advanced in explanation. Last week in *Nature* there appeared an article illustrated by a process illustration from a photograph taken by Mr. W. Aikenhead in Tasmania, and here we have not only one but several representations of black flashes. The picture was taken about nine in the evening, just at the height of the storm, with a hand camera, and is further noticeable from the fact that the flash portrayed is seen to be a triple one, three flashes almost blended into one, forming a kind of ribbon. This forms an excellent

example of a photograph of a much-disputed type. As most of the negatives of this character have been taken with hand cameras, it has been customary to dismiss the question by the simple assertion that the camera has moved during the photographing, and, as a flash often occupies an appreciable length of time, the movement has caused the image to travel and so the streak looks broad. This, no doubt, will explain many such pictures; but there are other photographs in which such an explanation would be untenable. It frequently happens that several flashes in immediate succession, and over the same path, occur. A photograph of such a condition was published in the journal we are referring to in October 13, last year; flashes had followed indelibly the same path at the estimated rate of thirty to thirty-five per second. Several eminent men discussed this appearance with non-accordant conclusions.

It is thus evident that there is plenty of scope for further photographs of these subjects, and those of our readers who take an interest in the subject cannot do better than have hand cameras ready-charged, as recently suggested by us. In the article referred to there is, however, strangely enough, a reference to a letter sent to the Royal Society by a writer in Buluwayo, who describes a flash that remained visible for sufficient time for the observer to call his friends out of an inner room to come and look at it, for them also to see it. “There could be no mistake about it, it was as distinct as possible, and it must have lasted fifteen seconds at least.” Our readers must not from this judge that recent remarks by us on the subject need recasting, for the occurrences we describe are only occasional, and it still remains true, as we said, that the best plan is to place the camera on a stand, with the cap off the lens, during a thunderstorm, and trust to chance that a flash will be included in its field of view.

**A New Mode of Photographing Star Spectra.**—Messrs. E. G. Hall and F. Ellerman have contributed to the *Astro. Physical Journal* an article describing some recent work with the great Yerkes forty-inch telescope in this direction. The telescope was only corrected for the visual rays, and thus the region of the spectrum that could be portrayed was limited, hence it was felt desirable to introduce a correcting lens. This, when made, consisted of two lenses of positive form, which were of 3.2 centimetres in diameter, and were placed not against or forming part of the objective, but in the cone of rays proceeding from it, and at a distance of about thirty centimetres from the slit of the spectrocope. The corrector has the effect of shortening the focus of the telescope by about six centimetres, “but, at the same time, so alters the curve of the original steepness of the colour curve that it is found possible to photograph a much larger extent of spectrum at the same time.”

#### JOTTINGS.

DOCTOR BRIGHTON, as Thackeray affectionately styled the Queen of Watering-places—the sovereignty of the Sussex watering-place, by the way, is disputed by several other British coast resorts—Brighton, be she Queen or Doctor, boasts possession not only of a considerable number of photographers, but also of many who, by reason of the excellence of their work, are entitled to rank as first-rate men in their profession. In the less aristocratic quarters of the town the badly printed and crudely vignettied surface print still holds great sway; but, if the attention be directed to those brilliant thoroughfares which compare not unfavourably with the principal “shopping” streets of the West-end of London, it will be seen that a very handsome set of photographic establishments, exhibiting capital work, is a prominent feature of London's largest suburb. This, at any rate, was the impression made on my mind one afternoon last week, when the interval between a couple of business appointments gave me the opportunity of a ramble round the town, which I utilised by studying local photography. Something like the omnibus-driver who, having a day's holiday, devoted it to 'bus riding with a friend.



There have been, and are, some familiar names associated with Brighton photography. Was not Mr. J. J. E. Mayall thrice Mayor of the town? As long as I can go back in photography there has been a Fry at Brighton. At present the name survives in the person of Mr. A. H. Fry, whose studio is at East-street. Mr. Fry not only makes charming medallion and other portraits, but takes capital views. It transported me, in fancy, right away back to the early eighties to see at East-street a very fine enlarged portrait of the late Mr. Clarence Fry, whom I used to meet at the great Baker-street house, in London, and who was one of the most lovable personalities of his time in photography. Mr. A. H. Fry, as I have hinted, is *facile princeps* at both portraiture and landscape, and his elegant establishment is within a pebble's throw of the King's-road.

Yet another familiar name catches the eye—that of Lombardi, in West-street, the busy thoroughfare which the tripper traverses from the station to the sea. The present proprietor of the business caters for the popular taste by supplying bromide midget portraits at a low price. For work of this kind there is always a strong demand amongst the masses. While looking at a well-executed enlargement placed on view, the subject being a part of the beach near the Grand Hotel, I was amused at overhearing the exclamations of delighted surprise with which a group of persons recognised some figures of children paddling in the water. I know none amongst life's little pleasures which is so keen as witnessing the momentary wonder of those who suddenly recognise themselves, or somebody they know, in a photograph which they have never before seen. Other popular photographic names in Brighton are those of Mora, A. & G. Taylor, and the total number of professional establishments there is between thirty and forty.

Pictorial portraiture in its highest developments, as they are manifested at the principal exhibitions, is apparently as slow to make its appearance at Brighton as elsewhere—there are no Crookes, Barnetts, or Hollyers in the town—nevertheless, with this reservation, you see there portrait photography of exceedingly great refinement and skill of execution. At the establishment of Messrs. Mayall & Newman, who are fighting the Brighton Corporation over structural alterations which, when completed, will give them a fine frontage to the King's-road, I see, in addition to a much-admired presentment of the great tenor, Edward Lloyd, a speaking likeness of a certain eminent optician, who shall be nameless. As a cricket lover, too, I find time to scrutinise some of Messrs. Hawkins' series of famous batsmen, bowlers, and fielders. For many years past Messrs. Hawkins have laid themselves out to work with the camera in the cricket field, and innumerable photographs of the kind have come out of Brighton to enlighten adherents of the national game as to how their heroes of ball or willow comport themselves in action.

In the Western-road the name of Henry Spink (who has a tastefully decorated studio, &c.) reminds me that it has for some time been absent from the exhibitions, at which he justly gained notice for his portraits of little children. Apparently it is to this branch of photography that Mr. Spink devotes himself, for he shows a great deal of it which is full of the qualities of charm and naturalness. The same pleasant thoroughfare includes the old photographic name of Edmund Wheeler, whose portrait work, especially that of lady sitters, is most admirable. Most of the photographers I have named show their prints in sepia platinum, or carbon, which struck me as being in pronounced favour. Don't imagine that the medallion portraits, to which I have referred in a previous paragraph, are tiny little pictures. They are from two to three inches in diameter, are quite circular, and, printed to a sepia tone on square brown cards, make very effective little photographs.

It would be a curious taste on the part of the public which could not gratify its predilections in photographic portraiture at Brighton, where, as I have briefly tried to show, all grades of society, from the highest to the lowest, are catered for. Broadly speaking,

Brighton photography is quite as good as you obtain in London. The same thing can be said of Edinburgh, Glasgow, and other large towns as compared with the metropolis. Yet the public perceive, or affect to perceive, a difference unfavourable to provincial work, as it is one of the commonest things for people to decline to be photographed in a large provincial town, on the grounds that they would be done "better" in London. If they *do* submit to being provincially photographed, it is only with the idea of tentativeness—London, London must ultimately have the honour of transferring their lineaments to glass and paper. If the destruction of this delusion, so characteristic of the great and unthinking British public, took away some business from London, it would only mean a proper adjustment of the balance between town and country; for, as I have said, you get quite as good photography out of London as in it.

But, to return to Brighton: not only are those who want to be photographed well provided with suitable opportunities, but the equally large class who take photographs for amusement can easily minister to their requirements at the well-known and up-to-date photographic-dealing establishments of Messrs. Churchill, East-street, and Messrs. Hardcastle, East-street, both of whom supply the latest goods on the market. London-by-the-Sea is always animated. Fashion annexes it in the winter and spring, and leaves it to the tripper in summer, so that life of many kinds is ever to be seen there, and an invigorating air remains with it all the year round. In what happier circumstances could professional or amateur photography be practised with an hour's journey from London?

COSMOS

#### NOTE ON CLOUDS: THEIR USE AND ABUSE.

It is at present the custom with a good many workers to put clouds into all the landscape work they do. This appears to me to have its faults. For instance, one is often greatly impressed with a subject where the sky is absolutely blue, without a cloud in it; therefore it strikes me that to introduce clouds into a picture of this description is, to a great extent, interfering with nature, and with the effect that the whole character is altered, and what one desired to express in monotone is, more or less, marred in consequence. There are, of course, many instances where the introduction of clouds is a great gain, but I specially refer to nature in its peaceful form, when the very grandeur of the scene is chiefly due to nature's silence, and one can almost imagine that the world itself was indeed asleep, so still is everything around one. It is in such a case as this that the introduction of clouds is, to my mind, a marring element. Granted that one has taken a woodland scene, glade, or, indeed, almost any view under the conditions above described, then, in after-treatment, I think the judicious sunning down of the sky adds not only to the pictorial quality of the picture, but lends value, if not grandeur, to the subject.

There is, of course, the other aspect under "The Abuse of Clouds," which I will only briefly touch upon. It has struck me how often, when the insertion of clouds by double printing has been resorted to, the clouds selected were at distinct variance with the character of the subject chosen, and, instead of strengthening the picture, had directly the opposite effect, tending more to irritate than to please.

W. I. CHORALL.

FOCussING HARVEST SUBJECTS.—Having selected and arranged our subject, leaving out as many things as we find we can do without, the next question is focussing on the ground glass. Now, here comes in taste and judgment. Let us consider this question. Why do we focus a part or the whole of a picture sharply? The answer is, We want to see clearly and distinctly, and a part or the whole of the subject. Now, in the subject before us, what do we want to see? First, we want to see the men, and then we want to see their immediate surroundings; the distant fields we know are there, but they only interest us in a general way. Well, then, we shall just give attention to the figures. We also want to see a few stalks of the corn; first, those that are close to the men, but we do not want to see every single stalk or ear. If we see two or three, the others we can take for granted. Therefore, in this case, we shall give our chief attention to the men and their immediate surroundings, and then use a small enough stop just to give us the general impression rather than the microscopic detail of the rest of the picture. —*Photographic Scraps.*



## FINISHING BROMIDE PRINTS.

SINCE the advent of the air brush, most of the large photographers have used it for "working up" their bromide prints and enlargements; but the price of it is prohibitive to many who have but few prints to finish. They are either content to send them to a trade enlarger to finish, or leave them as they are. It would surprise most photographers what an improvement can be effected in the finish of a bromide by the judicious use of the most simple and inexpensive tools.

The surface of bromide prints lends itself admirably for "working up" on account of its rough surface. By "working up" is meant generally improving, removing defects, strengthening faint detail, brightening flat high lights, defining outlines, drawing in backgrounds, &c.

Contact prints require but little treatment unless they are flat, as the greater part of the detail can successfully be brought out in the development. With enlargements it is different, their outlines will not be so sharp and well defined, and they will have lost a little in brilliance, so they will require more working up to remedy these defects. The articles required are, one bottle of black stumping chalk, a tablet of Indian ink, one tube of Chinese white (moist water-colour), a bundle of paper stumps, two fine camel's-hair brushes, and one Hardtmuth's black chalk crayon, No. 5.

All the above may be bought at any artists' colourman for less than two shillings. A palette for the colours and a pad for the powder will also be required, but these need not be bought, as excellent ones can be made at home with very little trouble. Two clean waste negative glasses—one for the Indian ink and the other for the Chinese white—will do for palettes. To make the pad, obtain an empty tobacco tin (or other tin about the same size) and a pyro bottle cork; cover the latter over with cotton-wool to make a nice smooth pad, and over it stretch a piece of clean chamois leather, and stitch tightly together at the bottom, so as to leave no creases on the top part. Place in the tin, smooth side up, and fill in the sides with paper.

To prepare the pad for use empty a little of the black chalk (very little) on to it, and evenly rub all over with another piece of chamois leather. The chalk should be just sufficient to black the pad all over without leaving any loose on the surface. Too little chalk can easily be remedied, but not so too much. An easel will be of great assistance, but is not absolutely necessary. An excellent substitute can be made by placing a box on the table in such a position that the photograph is tilted at an angle of about forty-five degrees. The print must first of all be mounted, as any attempt to mount it after the "working up" would only spoil it. It will be advisable to practise on spoilt bromides at first, they make excellent trainers on account of their defects. A mask large enough to cover the whole of the mount, back and front, only leaving the print showing, must be cut out of paper. This will prevent the mount becoming soiled by any loose particles of chalk. The high lights are the first parts to touch up, which are done by means of the Chinese white, a little of which should be squeezed out on to one of the glasses, and some water added and well mixed. The finest brush may then be taken, and lightly dipped in the fluid, taking care not to have it too full or too dry. It should be applied to strengthen the brightest high lights of the photograph, such as that on drapery, the glitter on water, the whites and shine of the eyes. Care must be taken not to make them too white or to destroy any half-tones. If the picture is rather flat, it will not stand the high lights being made white, so a little of the Indian ink (very little) may be added to make it to a slight greyish-white. It is well to test the colours and chalk before using on a piece of waste bromide paper of the same surface as that used.

The backgrounds of vignettéd portraits may often be improved by painting on a wavy wash of white and grey, taking care not to have it too uniform. Clouds may be painted in on a landscape sky by means of washes of white for the bright portions and graduated greys for the shadows. For the first attempt it will be best to copy some clouds from a photograph or engraving. It must be remembered that the clouds must be lighted from the same side as the view, or the result will be unnatural. For instance, if the light comes from the left, the clouds must have their brightest part that side, and the shadows the other. Before attempting to use any of the chalks, the print must be allowed to thoroughly dry, or it will smudge. Sharpen the black crayon up to a fine point by rubbing on sand paper, and finish off on emery cloth. Then wipe on a piece of linen to remove all superfluous chalk, and it will be ready for use. When in use, it must be held between the thumb and first two fingers, about two inches from the point.

It must be held very lightly, so much so, that it practically rests on the hand. Although held lightly, it must be capable of making a firm, fine line, without any shakiness. It should be held almost upright in making a fine line, but, where a thicker one is required, it may be obtained by lowering the angle so that it is made by the side of the point. For a faint line the crayon is held lightly, and, for a deeper, firmer. The use of this crayon is to gently draw round the outlines of the different objects and make them more definite. Faint detail may also be made clearer by its judicious use.

It can be used to work up the shadows of the hair and eyebrows and the pupils of the eyes.

Now for the use of the chalk and stumps, which is the most important part. They are used for deepening the shadows, working on the half-

tones, and toning down too pasty high lights. The method of using is to hold the paper stumps about half an inch from the end by the thumb and first finger, using the second finger underneath as a rest. Draw the point part over the pad, so that about half an inch of it is covered, and then test it on a piece of waste bromide paper, to see that it is not loaded with too much chalk. A beginner usually makes the mistake of using the chalk too thickly. The shadows must first be worked over, taking care not to destroy any half-tones which connect them with the high lights. The stump ought to be held in such a position that the point is not used, but the side of the point. If the stump is about three inches long, this will mean that the end will be about one inch above the picture. It must be held lightly and worked from left to right with a gentle rubbing motion. It should on no account be scraped along. If the shadows are not deep enough, the stump can be recharged with chalk; and, if the shadows have been made too deep, the only plan is to remove some of it by gently rubbing with clean cotton-wool. Do not sponge or use water, or the result will be failure. The half-tones may then be improved. For these the stump will require but little chalk, and it must be so worked that they graduate into the shadows and high lights. Numerous other improvements can be effected in bromides by the judicious use of the above simple implements, and will require but little practice to become proficient in their use.

OSBORN THORNBERRY.

## THE SOUTH LONDON SOCIETY'S THIRD CONTINENTAL EXCURSION.

## A WELCOME FROM THE BELGIAN ASSOCIATION OF PHOTOGRAPHY.

UNDER the combined leadership of Messrs. William F. Slater and Walter D. Welford a party of thirty-eight members and friends (four ladies) have just spent a very enjoyable week in Belgium. Leaving Liverpool-street on Saturday night, August 19, *via* Harwich, it was found, as soon as the members were safely housed in the reserved berths, that only Mr. Welch, of Portsmouth was missing. Although the boat was very crowded, the arrangements made beforehand ensured comfortable accommodation for each member of the party. As soon as the boat was well out to sea, the evening being pleasantly cool and the sea calm, an endeavour was made in the smoke-room to introduce the visitors and members to each other. One or two gentlemen make a good start by walking the deck all night, but the majority sooner or later found their way downstairs for sleep.

Sunday morning proved fine, and, as it was known that the journey up the Scheldt afforded good opportunities for the hand camera, most of the members were on deck pretty early, and thus early in the trip plates were exposed, some fine cloud studies and passing vessels, and one or two villages on the banks, being secured in passing. Antwerp was reached about ten, and a start was made for the East Station to deposit the luggage. Owing, however, to the enormous crowds pouring in from the country to see the great religious procession, and the later one in honour of Van Dyck, it took some time getting to the station. After a slight lunch every one proceeded to view the Van Dyck procession, and naturally got very much separated. Some excellent shots were obtained, the wide boulevards and orderly people affording much assistance; indeed, one energetic lady member induced some of the huge figures, camels, &c., to stop and pose for her. Leaving Antwerp at 2.50, the Hôtel du Rhin, the headquarters at Brussels, was reached about four p.m. This hotel was chosen on account of its proximity to the Gare du Nord, the station from which all the excursions started save one. It took the leaders some time to allot the bedrooms to suit the married couples and friends who wanted to be together, and at six o'clock everybody was ready for dinner. Later on, small parties visited the Fair, the Palais d'Été, a variety entertainment, and had a good general look round the main boulevards and streets, which, being Sunday night, were well thronged with gaily dressed people.

*Monday.*—The leaders had to leave breakfast early, in order to interview the station-master about the arrangements for the various excursions. Single fares for the double journey were granted, the party to be at the station fifteen minutes before the departure time of the train. Two corridor carriages were reserved on the 9.15 a.m. train to Ghent, which, with only one stoppage at Alost, was reached 10.34. The members set to work in earnest immediately, many patronising the Cathedral of St. Bavon, permission for a limited time being readily obtained. It has an unpromising exterior, but inside it is one of the most richly decorated churches in Belgium. The rest of the members went on further and gradually divided into twos and threes. The canals, the old castle of the Counts of Flanders, the Palais de Justice, some quaint courts on one side of a canal, the Hôtel-de-Ville, the Church of St. Jacques, and many other subjects kept every one busy. Upon arrival at the station, considerable excitement, huge wreaths, bands and banners told of something special. It appeared that on the previous day, at Antwerp, a Ghent musical society had gained an important prize, and this was a huge reception awaiting their return. Leaving Ghent at a few minutes before seven, headquarters were reached in good time for dinner, 8.30 p.m.

*Tuesday* was an early rising morning, breakfast being at 7.30 a.m. The train journey to Namur, in reserved corridor carriages, was enjoy-



able, and the party arrived just before eleven o'clock. It had been intended to take the boat down the Meuse to Dinant, but, as it leaves Namur at 8.45 a.m., necessitating a train at 6.48 a.m. from Brussels, the idea had to be given up, especially as it would be after midnight when headquarters were reached. A walk along the river, where Mr. Welford took his first biokam film of the party walking in procession, was followed by lunch, and the intermediate time before the train started was utilised in visiting the Citadel, &c. A short train journey brought the party to the picturesque town of Dinant. Here the members had hardly got out of the station before commencing work. Dinant is attractively situated at the base of high limestone cliffs, and even general views of the town are worth photographing. At the highest point of the cliffs is situated a fortress, a conspicuous addition to the landscape. Many members negotiated the 400 odd stone steps to the summit, from which excellent views of the valley were secured; but most of them had a rest at a little café upon their return. Dinant is a charming place for photographer and tourist alike. The train was again taken at 6.40 p.m. to Namur, where dinner had been arranged for, and eventually the party reached Brussels some little time after midnight, all pretty tired, but satisfied with the enjoyable outing.

*Wednesday.*—A short excursion was taken, owing to the long day before, and Waterloo was visited. Taking the train at 9.45 a.m., Braine l'Alleud was reached at 10.40. The Lion Mound, Hougomont, the various monuments, &c., were all visited. On the way to the Mound another animated photograph was taken in the biokam. The members arrived home at varying times in small parties. After dinner, a start was made for the Waux Hall musical gardens, for which the Association Belge de Photographie had sent the tickets. The gardens were filled with a select audience of some hundreds, and the orchestra was a magnificent one. The party was welcomed by MM. Rutot (President) and E. Stadeler (Secretary of the Brussels section), M. Vanderkindere (General Secretary of the Association), and other members, Madame Rutot entertaining the lady members. Soon after arrival, the orchestra played "God Save the Queen," to which Mr. Welford initiated in reply to the honour three good British South London cheers. It being a public-garden entertainment, the meeting was quite informal, but the party fully appreciated the honour and endeavoured to be paid them. The friendly feeling shown by this gathering of Belgian and English photographers made Wednesday a red-letter day in the annals of the excursion, and the wish was freely expressed that the South London Society might have the opportunity of reciprocating the attention paid them in Brussels.

*Thursday.*—Leaving Brussels at 9.30, and arriving at Antwerp at 10.44 a.m., the day was devoted to that paradise for photographers, whether hand or stand workers. Mr. Slater was most assiduous on behalf of those desirous of photographing inside the Cathedral, a franc each admitting any member whilst the building was closed to the general public. Others went to the quay, and roamed about the old streets, the docks, and various quaint courts they discovered. In the afternoon several patronised the Zoo, where no restrictions as to the use of cameras exist. In fact, every one had been somewhere and found "a real gem," and the train journey home was a friendly bragging match as to the respective picturesque finds. Dinner at eight o'clock, with a stroll afterwards, concluded a most enjoyable day.

*Friday.*—According to arrangements made on Wednesday night with the Belgian Association, MM. Rutot, Stadeler, Delevoy, Vanderkindere, and Nonpere called at the hotel at ten o'clock to take the party round about Brussels. Mr. Slater, however, was anxious to secure a group of the whole party and their Belgian friends. This was accomplished in the Botanical Gardens, and then followed a delightful and varied trip, commencing with the canal, fish market, flower market, then up to the Bourse, the Maniken, a short rest was taken in the Petit Sablon Gardens. Then the tram was taken past the Palace de Justice to the Bois de la Cambre, the great park of Brussels, where lunch was partaken of, and a rustic bridge much photographed. Another tram was then taken to the Parc du Cinquantenaire, in which remain several buildings of the great 1897 Brussels Exhibition. Here the Panorama of Cairo was visited, and a few shots were made at it. The electric tram was then taken to Tervueren, and a really pretty journey through part of the Forêt de Soignes brought the party to a very large and beautiful park, containing a fine château and lake. It is a Royal park, but the château is now used as a museum. Amongst the trees some of the stand-camera men were very busy, and as a good deal of ground had been covered during the day, rendering it difficult to find time to erect the tripod, they made up for lost time. The return journey by tram was just as pleasant, and the party reached the hotel at seven p.m., well satisfied with the efforts of the Belgian friends to provide an interesting day.

After dinner a little surprise, planned by Mr. Mason, of Fakenham, Mr. Rogers, of Croydon, and others, took the form of a presentation to Mr. Slater. Mr. Newson, in a neat little speech, referred to the untiring efforts of that gentleman for the comfort and enjoyment of the party, and that it was a unanimous wish that they should recognise his labours on their behalf. He accordingly had the pleasure of handing to Mr. Slater, on behalf of the ladies and gentlemen of the party, a slight token of their esteem. This took the shape of a handsome card basket

in oxidised silver. Mr. Newson continued that they wished also to recognise the services of their other leader, Mr. Welford, but, fortunately for him, he had brought Mrs. Welford with him, and following the precedent of last year, when Mrs. Slater was similarly honoured, he had the pleasure to hand her also a token of their appreciation. A very pretty silver sugar basin was then presented to her. Mr. Slater and Mr. Welford (the latter evidently much taken by surprise), having replied, Mrs. Welford was induced to say a few words, and a pleasant little function brought the dinner to a close.

Saturday was devoted to shopping, buying presents for wives and relations, and in cigar and tobacco purchases. Several members took out their cameras for subjects left over to the last, and with lunch at one o'clock there was not much done but packing. Leaving at six o'clock, the boat was reached in good time, and the party settled down for the last bit of the excursion, the voyage to Harwich. In the smoke-room Mr. Slater got all the accounts in order, and, to every one's satisfaction, it was found that the total cost was about 5s. per person less than the advertised estimated total. More speeches followed, three visitors gave in their names for membership of the Society, several medals were offered for competitions in connexion with the trip, and things were kept going until a late hour. Even after this a little excitement was caused by the temporary grounding of the boat upon a sand bank, and a very narrow subsequent escape from a collision. But the South London are a hard lot to kill, and so Harwich was reached in good time, the Customs passed, and the train steamed into Liverpool-street punctually on schedule time.

The whole trip was a great success; not a drop of rain fell, the leaders worked well for the party, there were ample subjects for the innumerable plates taken (over 2500 exposures, an average of about seventy to eighty each photographer), the kindness of the Belgian Association and the general amiability and sociability of the members and friends all worked to make the third Continental excursion of the South London Society a record in pleasure as it was in number.

#### THE REPEATED USE OF DEVELOPING SOLUTION.

At the London and Provincial Photographic Association, on August 31, a long discussion took place upon a point introduced by Mr. R. P. Drage regarding the repeated use of a developing solution. Many there are who claim that they can use their solutions time after time without appreciable difference in the result, whilst others maintain that the results are not the same with a developer used more than once. One man who was asked what reason he had for preferring to use a developer a second time answered that he could use the water he washed with more than once, but still he did not, and it had been said that it was really false economy to use a solution for more than one plate. Mr. Drage thought, however, that photographers often used their developers repeatedly up to three or four times, eikonogen, hydroquinone, amidol, and some of the other developers allowing of this without producing marked difference in the results.

Mr. J. S. Teape said he was in the habit of keeping his old developing solutions, which, in the case of a little over-exposure, he found it well to employ in preference to the freshly made solution. He had only availed himself of this fact during the past few weeks, hydroquinone, rodinal, and amidol alike answering the purpose. The activity of the solution was a trifle slowed down, possibly due to the presence of a small quantity of bromine liberated from the plates before developed, which retards the action to some extent.

Mr. E. J. Wall said that the only difference between the fresh and the old solution was that the latter was slower. The resulting negative, he considered, would be the same in any case, except that it would require longer to come to the state desired with the used solution. He expected that a fresh developer, with the bromide increased to correspond with the old developer, would act identically with this latter solution.

Mr. Teape said that, if one slowed the developer to a small extent, one increased the contrast proportionately in the result, and this held, he thought, with any developer to be named. A developer which had been allowed to stand and absorb oxygen, or one in which the bromide had been increased, certainly gave greater contrast.

Mr. H. C. Rapson thought it was a fact that more detail was obtained in the shadows of a negative by diluting the solution.

Mr. Teape pointed out that he did not include the means of slowing development by dilution, but where the reducing agent was kept at normal strength and the slowing effected by other means. Then the contrast would be increased, but dilution would give the detail. He also pointed out that under-exposures which, with twenty minutes' development, would result in a black-and-white negative, might, by modifying the solution so as to extend the time for completion to three hours, be made to yield a negative with good detail in the shadows, and be quite printable. But many people thought twenty minutes a very long time, and three hours out of the question.

Mr. W. D. Welford asserted that a developing solution could be used again and again with good results. Two ounces of developer, developing two plates at a time, might be made to last out for twelve plates, show-



ing that it could be used six times at least. The effect was to slow the development, but the result was much the same. He had been using ortol, which showed a continuing power much more marked than anything he had seen. If, for instance, one wished to get a little extra density upon a plate with this developer, it might be taken out and washed under the tap. He had even gone as far as to put a plate, as soon as the image showed, into a vessel of plain water, or under the tap, and by this means completed the development. Thus it was not wise to trust to water to arrest development. The fixing solution alone would suffice. He was now working first with an old solution of ortol and as fresh developer, plain water restrained and plain water. With these one could negotiate any kind of exposure.

Mr. Wall said there was admittedly an enormous excess of reducing agent in every formula, most of which was wasted, and it was certainly possible to use repeatedly the same solutions without risking a weakening of its action, but simply slowing it. The result was the same practically, if sufficient time were allowed.

Mr. Teape could not agree that the result was actually the same. In a batch of ten plates, one he found it impossible to develop, even after forty-five minutes' treatment; but, transferred to a fresh developer of the actual constitution of the used developer, the image came up wonderfully.

Mr. Rapson said he had used a plate with which no bromide was allowed in the formula, and its action was to slow the action at least four times. He noticed that with the developer advised a plate would be completed in from four to eight minutes in the fresh solution; but, if a second plate were put in, five minutes showed no action.

Mr. Welford undertook that a bottle of old ortol developer, bottled for three months, would develop a correctly exposed plate quite satisfactorily.

Mr. Wall stated, finally, that it was true that, for five or six times, any normal developer would work well under repeated use. It was then not false economy at all. He would exclude pyro formulae, perhaps, because of its strong staining properties, which would in themselves preclude its use.

### THE ILLEGITIMATE IN PHOTOGRAPHY.

[Abstract of paper read at the American Convention.]

We meet for improvement, and to improve we must observe the work of others, as the work displayed is, or should be, their best effort; and when we have the best efforts to study there is always something to learn. In speaking of best efforts I come to one class of the illegitimate, and that is the so-called freak or accident. If we are gathered here to reward careful, painstaking, conscientious work, how can we consistently reward the result of an accident or failure? And that is just what has been done on some occasions. In one instance the party receiving a reward or prize said he had thrown the negative away, being so much under-timed as to render it utterly worthless. Seeing certain effects in a painting, he had one day brought it from the waste box, and, making a print, which, of course, was flat, weak, and grey, called it *Winter Twilight*, or some such name, although the exposure was made in mid-day. Now, was it improper to award a prize to that picture? Some might say the man deserved it for taking advantage of the effect to produce his picture. Others would say, "What is the use of our trying to improve in our work by careful study when a failure gets the prize over our honest efforts?" We surely cannot improve by having a failure held up to us as the standard of excellence. Under this condition the work was not legitimate.

Now, in another connexion, I might mention the etching or other work done on negatives, by which effects are sought after that cannot be produced by pure photography, such as the introducing afterward of water, rocks, trees, and various other effects. In most instances it would have been better left undone. Whether done well or not, it has no place in photographic competition, as a draughtsman or an artist is one thing, and a photographer another. Such work might be entered in a class of its own, but should not be placed in competition with pure photography. As a man may be thoroughly artistic in photography, and, unless it is a special gift, may not be able to draw an object, no matter how many pictures of this kind he studies, therefore, at a convention of photographers, pictures containing other than that which can be produced by photography pure and simple should be considered illegitimate. Our intention should be, after seeing the best that can be produced with camera and plate, to try and equal it. The camera and plate are to be had. All they need are brains and study at the back of them. It is the study of a lifetime to pose easily, light properly, and get on your plate what you are after, without taking the time to look around for accidents or learning to draw.

Sometimes I have heard the word "illegitimate" applied to certain odd effects in lighting and printing; but, if they are the results aimed at and produced by means within photography, I should not consider them illegitimate, though often not in good taste.

Photography is no longer in a primitive state. The time when chemical results alone were the greatest virtues to be sought for is past. We now have our plates given to us in uniform quality, with the necessary formulae to obtain the best results. Then, why consider

chemical results as the greatest point in awarding prizes? There has been such great progress made in a true art way that we should now look to the art quality as the greatest factor of merit in modern picture-making. It will be safe to say that a man acquainted with the necessary art principles, and starting out to make his picture based on this knowledge, will not stop at having his composition and lighting correct, but will look to his chemical work to properly render the effect he wished to produce. Therefore, recognising one, we may recognise the other.

Another point that should be considered in this advanced period is originality or individuality. To destroy this would be the greatest wrong. We should also always put as much of ourselves in our pictures as is possible, adhering still to the art principles involved. And I will repeat that any effect, no matter how odd, if it was one sought for knowingly, and was obtained by a purely photographic method, will have to be classed as legitimate.

However, I do not believe in encouraging absurdities under the guise of art. I sometimes feel that a good many of us trust, in a blind way, to the word "art" to excuse us in making any kind of freak. By the word "freak" in this instance I mean any effect produced outside of the limits of good sense and good taste.

J. S. SCHNEIDER.

### PRICES AND HOW TO GET THEM.

[Abstract of paper read at the American Convention.]

Price depends entirely on place, circumstances, experience, and merit, as in all other occupations or professions. Surely the newly graduated practitioner of law or medicine would not expect the same fee as the experienced expert of a quarter of a century. In a manufacturing town, in which the inhabitants or a large majority were in receipt of a bare living income, they would not pay the same prices for photographs of even the first quality as in cities where there might be many wealthy people. Here, certainly, the principle of the nimble sixpence must prevail, and larger sales with small profits be the rule. Then, again, comes the question of expenses. I find many photographers in the smaller towns much more prosperous in proportion to the amount of business done than those in large cities. In the latter the expenses often are prohibitory to the attainment of a profitable result. If I make my lowest-priced photographs at \$6 per dozen, and some of my friends from the smaller towns get only \$3 for the same quality and quantity, they should be consoled with the thought of difference in expenses. Many of this audience do not pay as many hundreds of dollars for rent as we pay thousands. How would you like to meet a disbursement of \$4000 a year for rental only? Then we have six months of paying business, while most of you have but a slight falling off in the summer and mid-winter months. Then, again, as I have intimated, is the matter of skill and experience. Possibly my forty years under a skylight, with repeated visits to Europe, studying in the great foreign schools of art, entitle me to a larger compensation than the tyro in the art.

These suggestions are all general, and are apart from special circumstance, such as the competition of the peripatetic or wandering photographer, who attempts to "skin a town," as the saying is, by moving in, reducing prices, and, when the sensation of his coming has subsided, moving out. Such occurrences can only be met by keeping up with the art, making such excellent work that our patrons will not be tempted to leave us. The public is not such a fool as we are apt to consider it, and there is in almost every town a spirit of loyalty towards the deserving in all kinds of business.

The roving photographer doesn't come to conventions. You have the advantages that this Association extends to its members by seeing the best work done on earth, receiving instruction in the practical or mechanical processes, and being educated on the art side by the distinguished men who have addressed you in the various schools and lectures. The man equipped as he will be here is in no danger from unprincipled competition. Strong men don't resort to it, and strong men are always in demand in all kinds of business.

I started, as a basis, with the lowest-priced picture, at \$6 a dozen for albumen prints. I discovered, after a while, that I was making a very few, and I supposed that the average price of pictures was more than the price announced. Of course, this was the result I intended to accomplish. I did it in this way: When a patron inquired the price of pictures, I, or my clerk, always answered the patron promptly, when asked "How much are your pictures?" by responding, "\$6 for this style, which is the general style in use." We never attempted at the start to get them away from that, nor did we endeavour, by showing them a round-cornered card, and pretending or claiming that upon such a card a more expensive result was produced, and upon that claim charging them 50 cents or \$1 more. If desired, we showed them a better style, such as platinum and matt picture, the price being \$6 for albumen pictures, \$8 for matt pictures, \$12 for platinum, and \$15 to \$18 for carbons.

Last winter I was curious to find out what the average price was which we secured from every man who came into my front door with the intention of purchasing or ordering a dozen cabinet pictures ostensibly at \$6 a dozen. I took the average for twenty-four working days. At the end of that time I found that the average price for my pictures had been



\$11.34 a dozen. I mention this to encourage you in showing to the public a very high standard of work.

The public is most sensitive upon their personal appearance, more sensitive upon that point than any other that rules human nature. You may find an old man or an old lady coming in who has not looked into a looking-glass in ten years, any more than just to give a little touch to the hair; but that man or woman, when approached upon the side of their personality, or their personal appearance, when you get them under the skylight—I am sure we have all had the experience—that man or woman will fix and prink a great deal more than young people. I mention that to illustrate the fact of this peculiar sensitiveness of human nature with which we deal, this vanity of personal appearance. So that, if you present to them a high grade of artistic excellence in your work, they will make sacrifices to possess such a picture as a personal gratification; not only a gratification to themselves, but a matter of pride in behalf of their family. An incident comes to my mind at this moment: A lady came in with her child and said, "Mr. Rockwood, I can hardly pay you \$6 for my little girl's picture, but" (looking at the platinum pictures), she added, "I must have one of these pictures if I have to cut off some of my household expenses." I was rather sorry to have her make such a sacrifice, and, being a personal acquaintance, I made a concession in price for her. But that illustrates the fact that they do want the very best.

And now, if I could run up to \$11.34 on an average on pictures, you see what is possible in the way of tempting the public. There was no mistake about these figures; that average did not include a single copy, it did not include a single enlargement, or the increase of an order outside of cabinet-size pictures. While there were a great many that were tempted into life sizes, enlargements, &c., not one single case was there where such were counted in. In addition to that, there was a large number of Salvation Army people, during that month, whose pictures I made for \$3 per dozen. I am a great admirer of that grand woman, Mrs. Ballington Booth. She is a very dear and close friend of mine, and for her sake, and those people who are with her, I made this concession in price at that time, which was a good while ago. During that month there seemed to be more of these Salvation Army people come into our gallery than we had had in a great while; but notwithstanding that fact, the increase was just what I have stated to you.

So, in the art, we cannot as a body fix upon a single, specific agreed rate by which all shall be guided in their prices. It is a question of location, a question of the character of your *clientèle*, and a question of artistic excellence.

There are not too many photographers. If I had a dozen sons to-day, and I found that they possessed at all the artistic element, I would do all I could to bring them into this wonderful art of ours, that is, if they had the enthusiastic temperament required for it.

G. G. ROCKWOOD.

#### SOLUTION FOR MOUNTING PRINTS, &c., WITHOUT COCKLING.

There is a formula in the ALMANAC under the above heading, which several of my friends have tried and failed to get to work, and from the Correspondence column the Editor seems to have had other evidence of failure.

With the use of gelatine for the purpose I have had much experience, and on looking up the formula can at once see where the failure comes in, in fact this is one of many cases where formula—*qua formula*—is of little use unless accompanied with further particulars.

The formula gives Nelson's No. 1 Photo-gelatine. This should not be used, but the cheaper sort, viz., No. 1 sheet, or, in fact, any of the cheaper white sheet gelatines about 1s. 6d. a pound. To make the solution the gelatine should be soaked in the water until it is quite soft, then melted by the aid of heat in a water bath (like glue is always melted); when the gelatine is all dissolved, the spirit must be added in a gentle stream, the gelatine being violently stirred during the addition of the spirit, and care being taken not to add more spirit than the gelatine will take; some samples of gelatine will take more than others, and, if too much be added, the whole will be coagulated and spoilt. When the spirit is all in, add the glycerine and stir them well in.

Thus far the formula, but now for using it. It cannot be used by smearing over the back of the print in the same way as a starch paste, but must be used as follows: Provide two or three sheets of ground glass a little larger than the prints to be mounted, also as many pieces of clean newspaper as prints, the piece of newspaper being also larger than the prints; now with a stiff hog's-hair brush smear over the ground side of one of the pieces of glass, previously dipped in hot water and drained, with the warm mounting solution; do this quickly and evenly, then lay upon it one of the prints face up, take a piece of the newspaper, lay it over the print, and proceed to rub the print down just as if it was being mounted upon the glass, paying particular attention to rub the edges and corners of print; this being done, lift off the newspaper and throw it away, then lift off the print, place it on the mount, and rub it down carefully, especially at edges and corners; for the next print again smear the glass plate and proceed as above. After a few prints have been mounted it is sometimes difficult to get an even coating of gelatine; in this case put that piece of glass on one side, take another,

dip it in hot water, drain it, and start afresh. The gelatine that adheres to the used glass plates can be scraped off and remelted for use again. The jar containing the gelatine should always stand in another jar containing hot water, and, if a large batch has to be mounted, this water should be renewed directly it falls below 100° F., then the mountant will be kept in a workable condition.

This method is an extremely good one for mounting prints upon any kind of mount, and especially thin ones, as it does not cause cockling.

W. T. WILKINSON.

#### THE WORKING HOURS OF ASSISTANTS.

BEFORE dealing with the hours of photographic *employés*, it will be well for me to mark down a few obvious, yet too often forgotten, economic truths. The number of hours an assistant works can be regulated along strictly economic lines, being so adjusted that there shall be no waste of his labour power. Taking the twenty-four hours of a day, we have to deduct a certain number of hours which a worker requires for sleep, rest, meals, &c., the remainder being devoted to his occupation; unlike a machine, a man cannot be kept working continuously, for he becomes tired and exhausted as his exertions are prolonged. There is thus a period when human labour is at its best and most effective, and therefore these hours are the most valuable to an employer, every hour worked beyond this time becoming less productive and, consequently, more expensive. In practice it is found that this loss through exhaustion does not occur during the final hours, but is distributed over the working time of a day of ten, twelve, or fourteen hours; it follows from this that a ten or fourteen-hour day may be of no more value to an employer than one of eight or nine, and that this is actually the case has been proved by showing that a reduction of hours does not mean a corresponding reduction of output. We may say, therefore, that the average wage-earner is capable of only a limited amount of work, which is fully brought out in about eight hours, but may be distributed over ten, twelve, fourteen, or sixteen hours. The general opinion of competent authorities from Alfred the Great downwards has been that eight hours per day is the period during which work is really effective and profitable; the employer who pays for a day of ten, twelve, or sixteen hours is thus buying his labour at the highest, and not the lowest, rate. That this is a fact has been admitted by many large employers of labour, since a reduction of working hours has given them an increased output on working expenses. From the economic standpoint, a reduction of hours may mean a gain to employers when the value of the work done increases; the number of hours worked is no test of the worth of labour, the only measure is the amount of wages into the value of the product, i.e., wages into output, not wages into hours.

Considering the working hours of photographic assistants in relation to the foregoing, we at once observe that they are arranged on the wages into hours idea, and not on the sound principle of wages into output, the whole system being briefly described as "give and take."

The first point to be examined is whether it is better for all concerned to work on the give-and-take plan, namely, the assistant must work late for no extra pay when business is brisk, and may leave early without any reduction in wages when business is slack, or to have a fixed working day throughout the year, with a stated rate of pay per hour, intervals for meals, and all extra time to be counted and paid for as overtime.

The "give-and-take" system is, we know, the general rule in the profession, and, in my experience, has proved a crude, unsatisfactory arrangement for settling a delicate question, being a constant source of irritation between employers and employed, for the reason that it consists of nothing definite and is open to any interpretation. The amount to be given and taken, by whom to be given and taken, and how, when, and where, it is to be given and taken can never be agreed upon, and neither party rests satisfied. An example will show the unbusinesslike character of this agreement; nearly all assistants work extra time during a year at Christmas, or at other busy seasons, and in compensation they receive a Christmas box, a gratuity, payment for a holiday, or some similar recognition of the service. Let us look closer into this custom. In the majority of houses the busy time extends for two, three, or four months at some one period, according to the season, and assistants work several hours daily beyond the recognised time of closing. Putting this at a medium estimate, including earlier starting, shorter meal-time, and overtime, as three per day, or eighteen hours weekly, reckoning the average payment of assistants at 6d. per hour, we have for the week 9s., and for the month 1l. 16s.; or, if we add overtime as time and a half at 9d. an hour, 18s. 6d. per week, 2l. 14s. monthly. For his extra work the assistant may possibly receive 1l. at most in odd half-crowns; the employer is thus a gainer by 1l. 14s. on wages alone, apart from the profit he will receive on the work finished. Multiply the one month's loss by 2, 3, 5, and even 9 and 10, and the assistant's overtime may be valued at any sum from 5l. to 20l. per annum; as a set-off he has the wages paid for dull days and time off, which rarely balances the account. The assistant may not express himself so plainly as I have done, but it is the recognition of the fact which explains his strong objection to unpaid overtime.



It may be urged that fixed hours, a standard rate of wages, and payment for overtime as time and a half could not be applied to photography because of its great dependence on atmospheric conditions and a good supply of strong daylight. This contention had some weight in the days of collodion, but with the advent of gelatine plates of extreme rapidity it may be safely said that, taking the country throughout, there are not more than three days in the year when exposures cannot be made in the studio. Retouchers also are competent to work by artificial light. In regard to printing also, it is becoming more regular with the increasing use of the rapid printing papers, and in a well-arranged printing-room very few days in the year will pass when prints are not obtainable. Altogether the amount of time lost through bad weather is comparatively small in any business having appliances for use on dull days; the centres of our cities are, of course, exceptions, but the larger part of photographic work is not done in such localities.

We are also told that business comes in rushes, and at times it is necessary to work at a pressure, whilst at other times there is not enough to keep the staff fully employed; hence the assistant should give time when busy to compensate for time lost when slack. This, again, is a weak argument, for common sense tells us that an employer does not engage an assistant unless he has sufficient orders to keep him engaged at a profit. I take it, then, that any business employing assistants will not be troubled with the difficulty of finding them profitable occupation. A rush of business simply means that the firm is under-staffed, and the only remedy is to engage temporary assistance, since, as a rule, a workman cannot suddenly double, or even slightly increase, the amount of work he has been accustomed to produce.

There is another objection, that a photographic assistant cannot be tied to stated hours, nor throw down his tools on the stroke of the clock, leaving negatives and prints, &c., unfinished. This contains very little of practical moment, for any skilled worker can arrange what he has to do to correspond with the time at which his task is to end.

These and other difficulties are scarcely worth consideration, since the payment for overtime and the fixing of an hour rate would entirely remove them.

The first step towards such a reform is for assistants to recognise that the old relation of "give and take" is not what it was when the assistant had personal relations with his employer. The employer is rarely seen in modern workshops, the assistant dealing solely with a manager or clerk; this fact alone takes from the "give-and-take" notion all the meaning it at one time had, the outcome being that all considerations of equity are destroyed, because the manager or clerk, whilst exacting his employer's bond, cannot grant any privilege to the assistant. Under present conditions the contract is very unequal and unjust against the assistant, for, whilst it professes equity, it leaves the decision entirely in the hands of employers. The agreement runs that the *employees* shall leave when their work is done, the employer deciding when work is done and when not done, a position which results in some strange judgments.

To remove these abuses, the relation between employer and employed must be founded on a basis of strict equity. This at a stroke destroys all gratuities, *i.e.*, Christmas boxes, payment for holidays, time off, slack time, dull days, &c., on the part of employers; and from assistants unpaid overtime and other unpaid services, the assistant being paid only for the time he is actually at work.

To state the agreement more particularly, I propose, in short, a fifty-hour week at 9d. the hour, the hours to be from eight a.m. to six p.m. on five days of the week, with one hour for dinner, and from eight to one on a Saturday. The full week would thus mean 37s. 6d. in wages. All overtime, that is, all time beyond the hours specified, to be counted as overtime, and to be paid as time and a half, or 1s. 1½d. per hour, these hours and rate of pay to apply alike to operator, retoucher, printer, as the minimum for a competent hand. Payment being by the hour, an hour's notice to terminate the engagement on either side.

JOHN A. RANDALL.

### SENSITISING CARBON TISSUE.

ONE of the reasons why carbon printing is not so much practised as it ought to be lies in the fact that prints made upon home-sensitised tissue are always so much flatter and inferior to those made upon tissue bought ready-sensitised, and, as it is not always convenient to have to send to the makers for a fresh supply, many people leave the process severely alone, and use some other that gives them good results without any trouble. The true reason of this is that all the published formulae for sensitising carbon tissue give far too strong a solution of the bichromate of potash, *viz.*, three per cent. in summer, five per cent. in winter. These are both far too strong, and with any tissue will give flat results. The best strength for the purpose will be found to be one and a half per cent. in summer, two in winter.

There is, however, another factor in the process to be considered, *viz.*, the operation of drying the tissue. The slower it is dried, the flatter will be the prints, and *vice versa*; and, when once dried, it should be kept under pressure or in an air-tight box, as the action of air upon bichro-

mated gelatine (especially if moisture be present) is the same as that of light.

If attention be paid to above facts, good carbon prints can be obtained from any kind of negative, which is more than can be said of any other printing process. A very instructive lesson can be got out of the following experiment: Sensitise two pieces of tissue, one in one and a half per cent., the other in two per cent.; dry both as quickly as expedient. Take prints with both as soon as tissue is dry. Keep some for two, three, and four days, and compare the results. The first ones will be much too hard, the last ones will be either flat or getting that way.

W. T. WILKINSON.

### FABRICS FOR PHOTOGRAPHS.

MR. J. A. HARVEY has patented an improved fabric material, having a coating or surfacing of rubber on its back, and being on its face side sensitised with a photographic solution of the ferro-prussiate or other suitable kind or kinds.

The objects of the invention are:—

First.—To produce a photographic-print fabric possessing greater strength and durability than paper or other materials generally heretofore employed or in use.

Second.—A material that will not stretch or alter its proportions during the development process.

Third.—A material that will not partake of permanent fold or a tendency to roll up again when opened after having been kept rolled some time, and

Fourth.—A material that is unaffected, or does not become damaged by wet or moisture.

The portion of the figure referenced or indicated A is intended to represent the face or sensitised surface, usually more or less coloured,



the middle portion, indicated B, the face of the fabric material before being sensitised, and the portion indicated C is intended to represent the backing of rubber, the fabric material being removed to expose the same to view.

The backing of rubber is applied to the fabric, which must be of fine and uniform mesh or texture so as to not permeate the same fully or prevent the sensitising liquid or solution from being freely absorbed in the front surface. The fabric may be linen, cotton, silk, or very fine woollen or other material or textile. The backing must be pliable and waterproof and is preferably rubber, but a composition of non-drying oil, white lead, and other substances also fulfils this condition fairly well.

### LIQUID PRISMS IN CINEMATOGRAPHY.

THE use of liquid prisms in cinematographic projection has been patented by Messrs. Lumière. The following is an extract from the specification:—

The film, A, which carries the successive images, moves vertically from top to bottom, impelled by the roller, B, provided with points, which enter the regularly spaced perforations of the film. It is guided by known arrangements, and passes behind an opening, C, the height of which is equal to that of two consecutive images or pictures.

In front of this opening is arranged the object-glass, O, and, at the back, an ordinary lighting apparatus not shown in the drawing.

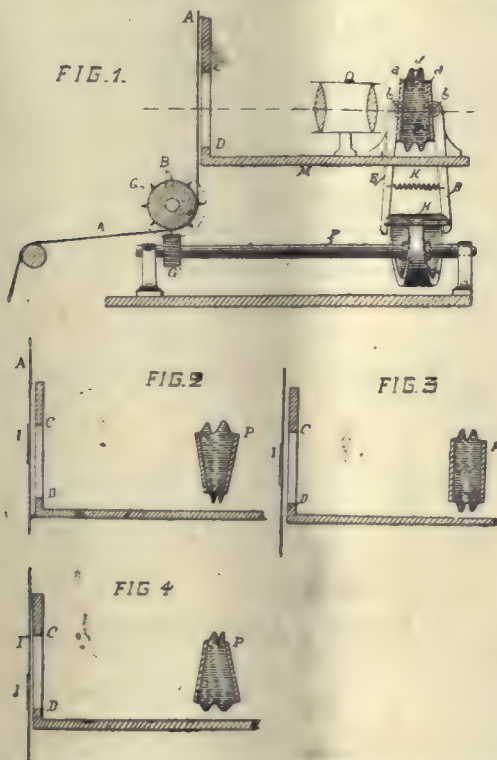
In front of the object-glass is arranged the prism, P, of variable angle, formed of two sheets of glass, A, A, with parallel faces, capable of oscillating separately on two horizontal axes, B, B. The sheets, A, are united at their edges by a rubber membrane, D, bellows wise, so as to constitute a liquid-tight box, at the same time leaving liberty of oscillation to the sheets. This box, filled with water, or other non-coloured liquid, the index of refraction of which is conveniently chosen, forms a prism, the faces of which can receive various inclinations, by means of levers, E, E, keyed on each of the oscillation axes, B.



The levers, *x*, are operated by a double cam, *n*, mounted on a horizontal shaft, *r*, receiving its movement from the drum, *b*, by means of helical gearing, *g* & *h*.

The cam, *n*, has the form of a drum, the two edges of which are symmetrically cut in helical form. The levers, *x*, bear on these edges by their interior face, the direction of which is parallel to the faces of the prism, and passes through the centre of oscillation, *b*. The levers are kept in contact with the cam by a spring, *k*.

The cam, *n*, makes one revolution during the passage of an image; its size and the speed of the helices are such that, in the middle of its



motion, the faces, *a*, *a*, of the prism are parallel (see fig. 3), and that at the extreme points of the motion (see figs. 2 and 4) they form in one direction or the other the maximum angle of deviation.

When the image, *i* (see fig. 2), occupies the upper part of the opening, *c* *d*, the angle of the prism, *p*, is greatest, and has its opening turned upwards. When the image has arrived at the centre of the opening (see fig. 3), the prism has its faces parallel, and the deviation is nil.

When at last the image has arrived at the lower part of the opening, the angle of the prism is greatest, and it has its opening turned downwards (see fig. 4).

It is therefore possible, by a convenient choice of the maximum angle of the prism, to cause to coincide on the screen the projections of the images in these extreme positions (see figs. 2 and 4, with its medium projection, fig. 3). In the intermediary positions the coincidence will necessarily take place, because by construction the linear motion of the image is proportionate to the angular tangent of the prism, and that the motion of the projection on the screen is proportionate to the angle of deviation of the rays. Now, these two angles, at least within the useful limits of size of the apparatus, obviously vary in the same proportion.

At the end of each turn the prism returns briskly from the position shown at fig. 4 to that shown at fig. 2, so that the new image, *i*<sup>1</sup> (fig. 4), may be projected in its turn.

The size of the extreme angles of the prism is fixed by construction according to the focal distance of the object-glass, but it may be made to vary within certain limits by lengthening or shortening the arms of the levers, *x*, so as to permit the regulation of the apparatus. This result is obtained by raising or lowering all the upper part of the apparatus comprising the opening, the object-glass, and prism, mounted for this purpose on a movable support, *m*. This regulation may take place during the working of the apparatus by observing the projections on the screen. The apparatus thus arranged can naturally serve for obtaining negatives of animated scenes.

The error committed in admitting that the deviation is proportionate to the angle of the prism is of less importance in proportion as the variations of this latter angle are smaller, hence a means of reducing this error by replacing the single prism by two or a larger number of similar prisms, the deviations of which unite together to obtain the total deviation.

The maximum angle of each of these prisms is thus diminished, as well as the error which results therefrom.

Each prism will in this case be actuated by a helicoidal cam, similar to the cam, *n*, but of a much smaller motion, which lessens the briskness of fall of the levers, *x*, at the end of each rotation.

## THE COLOUR OF BLINDS.

THE remarkable and widely varying properties of the elementary colours which compose white light suggest, says the *Lancet*, that the employment of screens as in the blinds placed over our windows should be founded on a scientific basis. Our knowledge of the properties of each individual section of the spectrum is not exact; but this much we do know, that the rays of least refrangibility, the red rays, are without direct chemical effects, they occur at the heat end of the spectrum. On the other hand, the rays of the highest refrangibility contain the violet rays, which chemically are exceedingly active. It is these rays which are concerned in photography, and, doubtless, also in the great processes of vegetable nutrition and growth. The object of blinds is, of course, twofold—to keep a room cool and to screen out some of the light, so as to avoid the bleaching of colouring materials of the carpets and furniture. At the same time sufficient light must be admitted, so that the occupant may see without difficulty. What, then, is the best colour for the purpose? Since light exerts the peculiar action due to the actinic rays, which materially and wholesomely affects the air of a dwelling-room, care should obviously be taken not to exclude all the rays that are so concerned. Thus ruby or orange-red material would be contra-indicated. Abundance of light is inimical to the life of micro-organisms, so that a material in some shape of a compromise should be selected. The best for this purpose is probably a delicately ochre-coloured fabric. This would screen part of the active light rays, and, if of a fair thickness, the greater part of the heat rays, while admitting sufficient active rays to allow of a wholesome effect upon the room and its surroundings. Venetian blinds do not allow of the graduation, which is desirable, of the tone of light that may be adjusted with cloth fabric. As is well known, exclusively red light has been used as a therapeutic agent, and apparently with encouraging results, in measles.

## AN IMITATION PLATINUM PROCESS.

Mrs. R. B. WEST, of Newhaven, Connecticut, has patented the following method of photographic printing:—

The paper employed may be of the usual character, and the sensitising compound consist of ammonium nitro-prusside, 25 parts; ammonio-citrate of iron, or, as it is sometimes called, a double citrate of iron and ammonia, 30 parts; and water, 100 parts. To this may be added small quantities of other citrates for the purpose of modifying the colour of the prints; for example, the citrate of magnesium to produce an engraving black, or the citrate of zinc for a brown. These, while not absolutely necessary for the success of the sensitising paper, are of use for producing certain tints. Other soluble nitro-prussides, such as sodium nitro-prusside or potassium nitro-prusside, can be substituted for the ammonium nitro-prusside, but they are not as sensitive to light as is the ammonium nitro-prusside, which is therefore to be preferred. Paper coated with this sensitising compound is sensitive to light, by exposure to which it becomes brown or black, so that, when exposed to light under a negative in the usual manner for printing photographs, a picture in light and shadow is produced on the paper. This print is then washed in water for two or three minutes to remove superfluous chemicals, and then subjected for five minutes to a bath containing a mordant like acetate of lead in a two per cent. aqueous solution, for the purpose of rendering the print permanent. For this bath any other well-known bath for fixing the print may be employed. No further manipulation is necessary except a slight washing of the print in water.

## STEREOSCOPY.

MR. L. PAXTON sends the following interesting letter to the *English Mechanic*:—

"The original stereoscope was invented by Professor Wheatstone about 1840. At that time photography was in its infancy, and the first stereos were such objects as cubes, cones, prisms, &c., drawn as they would be seen with either eye. The spectroscope was a reflecting one, consisting of two mirrors set about at right angles to each other, so that the images of the pictures placed at some distance on each side appeared to unite behind the mirrors. The angle at which the mirrors were placed could be adjusted for pictures of various sizes.

"About 1855 or 1856 I made some stereoscopic pictures of Indian



temples with an ordinary camera, taking pairs of pictures, shifting the camera about a foot between the pair. Some of the prints were sent to Negretti & Zambra to mount, and they requested me to do them a set, sending me a very perfect stereoscopic camera for the purpose. It had twin lenses like an ordinary binocular camera, the dark slides being square, so that two sets of pictures were made on one plate. The camera could also be set upright, fitting on to a system of parallel bars, an arrangement devised by Mr. Latimer Clark. The photographs were taken so that the right-hand picture was taken on the left-hand side of the plate, and so did not require to be shifted after printing; the camera, with slides, fitted into a box, on the top of which the shifting bars were fixed, the bottom of the box screwing on to the tripod stand. I have lately done some very satisfactory stereoscopies with a hand camera, making the exposures first from my right hip, and then from the left.

"I do not think that it is very generally known that stereoscopic pictures can, with a very little practice, be seen without a stereoscope. Perhaps the simplest plan of educating the eye is to place two coloured wafers on a sheet of white paper about two inches or rather less apart. On looking towards them the eyes will tend to converge and form one image. The distance between the wafers can be gradually increased till the eyes can unite them at two and a half to three inches apart.

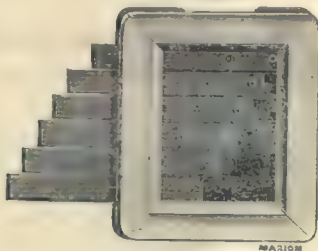
"On first trying to unite stereoscopic slides, it is as well to select some with a marked feature, which facilitates the uniting the picture. After a short time, however, there is no difficulty, even if the slides are less marked. The magnifying power of the lenses of the stereoscope is a great advantage if the prints have much delicate detail."

## Our Editorial Table.

### A SPEED-TESTING FRAME.

Marion & Co., Soho-square, W.

MESSRS. MARION send us a neatly made speed-testing frame for use as a guide in the printing of quick and slow bromide papers, lantern slides, &c., the construction of which is made clear by the annexed illustration. It is also recommended for plates and papers. The frame has six sliding strips by which the sensitive surface may be uncovered and ex-



posed for the whole or part of the width of the frame. By using an artificial light and making a series of exposures at a stated distance in the following manner a good guide to the necessary exposure can be satisfactorily obtained. The instructions are as follows: Place a piece of paper or a plate in the printing frame, with its sensitive side towards the sliding strips, and facing the film side of a negative if one is to be used in the test. Now at, say, one foot from the light, withdraw the strips in consecutive order, leaving them withdrawn and timing the exposures respectively as follows:—

Nos.	1	2	3	4	5	6
Seconds	16	8	4	2	1	1

The total exposure given to each strip will be as follows:—

Nos.	1	2	3	4	5	6
Seconds	32	16	8	4	2	1

The sliding pieces may be withdrawn half way, and two exposures made on each, with exposures of such length and in such progression as the judgment of the user may dictate. A comparison of two plates or papers may be made so as to give a fair idea of their relative speeds. Assuming, for instance, that the plate or paper to be tested is supposed to be considerably more sensitive than the one tested in the foregoing example, make the exposures in exactly the same manner, but at two feet from the light. The exposures in this case will be equivalent to the following times:—

Nos.	1	2	3	4	5	6
Seconds	8	4	2	1	$\frac{1}{2}$	$\frac{1}{2}$

Supposing the density of strip No. 4 in test B is equal to that of No. 3 in test A, it will show that B is practically eight times as sensitive as A,

and under similar conditions will only require one-eighth the exposure. This speed-testing frame, it will be observed, is a simple piece of apparatus, based on plain and easily grasped principles, and its uses in arriving at correctness of exposure in several branches of photographic printing are so obvious that it should find a place in the equipment of every photographer.

### PHOTOGRAPHY ANNUAL FOR 1899.

Edited by R. CHILD BAYLEY, F.R.P.S. 314 pp. Price 2s. 6d.; cloth, 3s. 6d.

London: Iliffe, Sons, & Sturmer, 3, St. Bride-street.

THIS issue of *Photography Annual* is compressed into space which is considerably smaller than that of previous volumes, all matter of the nature of reprint from former *Annals* having been omitted; nevertheless, the characteristic features of the publication have been retained. Mr. C. H. Bothamley, as usual, summarises advances in photographic chemistry and processes during the past year, Mr. Chapman Jones deals similarly with photographic optics, and Mr. Bolas with photo-mechanical printing. Another familiar name is that of Mr. Albert Taylor, who writes of astronomical photography, while Mr. P. E. B. Jourdain is responsible for the sections on photo-micrography and radiography. There are a number of capital photo-mechanical illustrations, reviews of apparatus, a list of societies, a trade directory, and other information, thus making *Photography Annual* a very useful book of reference.

FROM Mr. Wilfred Emery, of 8, Dyne-road, Brondesbury, N.W., we have received a set of Convention photographs taken by means of the folding Ape—an excellent camera.

MR. EDMOND WALLIS, of Orpington, Kent, sends us a selection of photographs of backgrounds suitable for employment in taking pictures of little children. The designs are varied and fanciful, and for juvenile portraiture the backgrounds should be in considerable request.

## News and Notes.

PHOTOGRAPHIC CLUB.—September 13, at eight o'clock. Members' Open Night.

ACCIDENT TO A PHOTOGRAPHER.—A man named Elson formed one of a picnic party from the printing establishment of Messrs. F. R. Sparks & Sons, Leeds, to Boston Spa on Monday. The party ascended the hill known as Jackdaw Crag, and on the top Elson, whilst placing his camera, fell over the crag into the river, a distance of about 100 feet. He luckily fell into a deep pool and swam ashore. He was afterwards removed to the Leeds Infirmary, when he was found to be suffering from a fractured jaw and concussion of the brain. Elson is reported to be going on well.

BOROUGH POLYTECHNIC PHOTOGRAPHIC SOCIETY.—The annual Exhibition of this Society will be held at the Institute, 103, Borough-road, S.E., on Wednesday, Thursday, Friday, and Saturday, December 27, 28, 29, and 30. Entries close December 9. The open classes are: H, Prints previously medalled, 1 gold, 1 silver medal; I, Prints not previously medalled to December 9, 1899, 1 silver, 2 bronze medals; K, Lantern slides previously medalled, 1 gold medallion, 1 silver medal; L, Lantern slides not previously medalled to December 9, 1899, 1 silver, 1 bronze medal. Further information to be obtained of the Hon. Exhibition Secretary, Mr. E. J. Hoar, 59, Hillingdon-street, S.E.

AMERICAN GLASS.—A Transatlantic contemporary, remarking that the American glass industry is only forty years old, adds that some glass was manufactured in America prior to that, but most of it came from the old countries. It has only been within the last twenty years that the nation has really met her own demands, and it is but within the last five or six years that practically all foreign glass has been shut out. It is true that the old countries still excel in general lines of fine manufacture, but this is getting to be less and less the case every year. The great trouble of the American industry now is that it has gone to seed. Over-production marks every line, and it is an absolute necessity that manufacturers' combinations or trusts control the production to keep the markets from going to the dogs.

CHLORIDES IN SEA AIR.—M. Armand Gautier recently published in the *Bull. Soc. Chim.* some investigations which he carried on regarding the maximum quantities of chlorides contained in sea air. The experiments were made at the light-house of Rochecroix, in October 1898. The air was passed slowly by aspiration through a long tube containing glass wool previously washed and dried, so that any mass held in suspension was deposited; 341 litres of air, under a pressure of 760 to 767 millimetres, at a temperature of 16° C., were passed through this mass of glass wool, which was then taken to the laboratory and washed in a little warm water. The chlorides contained in the filter were estimated by a silver solution. A total quantity of 0.00462 gramme of chloride was found, corresponding to 0.0076 of salt, which, by calculation, corresponds to 0.022 gramme of sodium chloride per cubic metre of air. It is believed that this quantity, together with the traces of iodine which accompany it, give sea air the tonic quantities which characterise it.



**A PHOTOGRAPHER COMMITS SUICIDE.**—On Friday last the Coroner for West Kent investigated a case of drowning of a Manchester man named Alfred John Elliott, aged forty-seven, a photographer, of 85, Stamford-street, Old Trafford, Manchester. It appeared that deceased was formerly in an asylum. On the previous Monday he went to London by the Great Central Railway for the purpose of spending a few days with some of his friends. He arrived at his friends' in a very excited state without his luggage. From his conversation they discovered that he was suffering from the delusion that he was Sandow, the strong man, and it is supposed that this delusion cost him his life. He subsequently disappeared, and the next his relatives heard of him was that his dead body had been found in Crayford Creek. He is supposed to have walked all the way from North London to Crayford, and he was last seen swimming about the Creek half dressed. The widow of deceased stated that he had never shown any suicidal tendencies, and eventually the jury returned a verdict of "accidental death."

AMONGST the visitors to Christchurch recently was a gentleman whose name is of world-wide fame amongst photographers and others, Mr. Willis, the inventor and patentee of the platinotype process, who, in company with Mr. Humphrey (the manager of the Platinotype Company), was cruising round the south coast in his steam launch, the *Yuen-yuen*, of the Royal London Yacht Club. Mr. Willis and his companion, who appear to be friends of Mr. Mallett, were met in the harbour by him and piloted up to the Quay. We believe that this is the first time that a vessel of this kind and size has ever visited the Quay. The *Yuen-yuen* is sixty-five feet long, with a draught of four feet, and is beautifully fitted up with a forty-horse-power petroleum engine, which seems a marvel of mechanics, when it is considered that this amount of power is contained in a room about seven feet and five feet. There is very little vibration, smell of the oil, smoke, or steam to annoy the passengers, and, what is equally important, no fear of an explosion. The engine and boiler are unique of their kind, and are the invention of the engineer of the Platinotype Company.—*Christchurch Times*.

**LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION AND CONVENTION SLIDES.**—During the past two months the meetings of the London and Provincial Photographic Association have been of an informal nature, but now a full programme has been issued for September, October, November, and December, which should prove of considerable interest to members. Commencing on September 7 with a demonstration of "Kachin;" other matters to be dealt with are: The Kromaz Colour Photography, the Tella Camera, Vicol, Wellington Film, and the Biokam. On September 14, the first Lantern Night, there is to be a display of Convention slides, and the Hon. Secretary, Mr. Walter D. Welford, will be greatly obliged if some of his Convention friends will assist him by sending him a few slides from negatives taken during the enjoyable week at Gloucester. He will take every care of them, and, if titles and producers' names are written on the slides, these details shall be given in full. Possibly some other London Society would like to devote an evening to them, and Mr. Welford will be pleased to give any assistance in this direction, and is willing to reciprocate by lending his own slides to any Convention for a similar purpose. His address is 19, Southampton-buildings, Chancery-lane, W.C.

THE Leeds Photographic Society have just issued the syllabus of meetings in session 1899-1900, which are to be held in the Philosophical Hall, Park-ro v, as far as practicable, on the second and fourth Tuesdays in each month, and the session gives promise of being in every respect an important one, and quite in keeping with previous programmes. A novel feature is the insertion of an extra leaf as follows: "Yorkshire Photographic Union.—Mr. —, being a member of the Leeds Photographic Society, is entitled to the privileges of an Associate of the above Union, and may attend any lecture given under the auspices of the Union, wherever it may be held.—J. Crossdale Comitas, Hon. Secretary." The session opens on September 26 next with "The Camera and the Wheel," by Mr. F. O. Byrnes (R. & J. Beck, Limited). On October 10 Mr. W. Thomas, F.R.P.S., will discourse on "Technical Control for Pictorial Purposes;" and on October 27 the President of the Batley Photographic Society (Mr. Percy Sheard) will treat of "Enlarged Negatives" (Yorkshire Photographic Union lecture). November 14, on "Lantern-slide Making" is the subject down for Mr. Godfrey Bingley (the President) (another Yorkshire Photographic Union lecture). Mr. J. W. Wade, of the Manchester Photographic Society, lectures on November 28 as follows: "In Search of the Picturesque." A tour in the English Lake district, Isle of Man, and North Wales, one other lecture, viz., on December 12, a demonstration by Mr. J. T. Sandell on "Theory, Practice, and Results with the Sandell Perfect Films and Plates (Multiple)," to be followed by the Annual Dinner, and on December 22 the Annual Meeting for the election of officers brings the first half of the session to a close with the end of the year. It is hardly necessary to say that the lectures are being looked forward to by the members with much interest.

**FORM AND HEIGHT OF CLOUDS.**—M. Antoniadi, F.R.A.S., and M. Mathieu, of the National Agronomical Institute, Paris, contribute to the September issue of *Knowledge* a profusely illustrated article on "Clouds." "The application of photography to the study of meteorological phenomena enables us to investigate with great advantage the form and height of the various clouds, the appearance of waterspouts, rainbows, halos, coronas, &c., as well as to record the fugitive sinuosities of the lightning flash. Nor does this mode of inquiry require any modification of the camera. A good large-angle object-glass, with an ordinary shutter, is all that is needed. For clouds, however, floating about the zenith, a movable-headed foot will be found of use. The simultaneous photography of the same cloud from two different stations will give its height above the earth's surface." A very instructive feature of the article consists in the reproduction and description of a photograph of a rainbow taken on June 2, 1898. "The photograph is interesting as showing the inner space of the bow to be much brighter than the outer, an appearance which is not always noticeable to the eye. This is due to the fact that, whereas no light is sent to the observer from the back of the drops situated outside the first and as far as the secondary bow, the drops inside the

primary do reflect light from their back, which, in spite of its enfeeblement through divergence, suffices to vaguely illumine the inner segment. This is the region of the 'supernumerary bows' unexplained by Descartes and Newton, but to which the illustrious Thomas Young, with the intuition of genius, applied his discovery of the law of interference of light. The condition necessary for the appearance of the supernumeraries is that the drops shall all be of nearly equal sizes. Otherwise, as in the case of the photograph, we have a confused superposition of the various colours, which are thus blended into white light."

## Patent News.

THE following applications for Patents were made between August 21 and August 26, 1899:—

FILM-HOLDER.—No. 17,028. "Improved Frame for Holding Photographic Films." C. BOUSSEAU.

FILMS.—No. 17,098. "A New or Improved Process of Producing Photographic Films." Complete specification. J. MEYER.

FILMS.—17,164. "Improvements in Photographic Films and in the Manufacture thereof." J. E. THORNTON and C. F. S. ROTHWELL.

FILMS.—No. 17,165. "Improvements in Transparent Photographic Films and in the Manufacture thereof." J. E. THORNTON and C. F. S. ROTHWELL.

FILM-COATING MACHINERY.—No. 17,215. "Improvements in the Method, Means, and Apparatus for Coating Photographic Paper Films and the like, and in the Manufacture of Photographic Materials." J. E. THORNTON and C. F. S. ROTHWELL.

EMBOSSING PHOTOGRAPHS.—No. 17,280. "An Improved Method of Preparing Embossed Photographs, Artists' Post Cards, and the like." Communicated by F. von Manger. E. EDWARDS.

DEVELOPING AND FIXING.—No. 17,292. "Improvements in Photography and connected with the operations of Developing and Fixing." J. E. THORNTON and C. F. S. ROTHWELL.

STEREOSCOPIC PHOTOGRAPHY.—No. 17,223. "Improvements in relation to Stereoscopic Photography." J. E. THORNTON.

ROLLING PRESS.—No. 17,307. "Cylinder or Roll-press for the simultaneous Staining and Mating, without heat, of Photos and similar articles of Graphic Art." A. H. ANDERS.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

Sep-ember.	Name of Society.	Subject.
12.....	Hackney.....	Platinotype Demonstration. Platinotype Company.
13.....	Photographic Club.....	Members' Open Night.
13.....	West Surrey.....	Affiliation Lecture: Bromide Enlarging. J. H. Gear, F.R.P.S.
14.....	London and Provincial.....	Lantern Night: Gloucester Convention Slides.
16.....	Borough Polytechnic.....	Excursion: Orshott and Esher. Leader E. J. Hoar.
16.....	Hackney.....	Excursion: Ponders End. Leader, S. Stean.
16.....	West London.....	Excursion: Westminster to Chelsea.
17.....	South London.....	Sunday Excursion.

### PHOTOGRAPHIC CLUB.

AUGUST 30.—Mr. Charles Wallis in the chair.

MR. W. D. WELFORD showed some film negatives of Egyptian scenes taken with the Tella hand camera, jocularly asking for an explanation of certain marks thereon, to disguise the real fact that the negatives were taken at a panorama in Belgium, representing Cairo, which, however, was not suggested by the negatives themselves, except on very close inspection. He spoke appreciatively of the Tella camera. He also showed a number of films which he had taken in Belgium with the biokam, a small cinematograph apparatus. Some time ago he had shown this apparatus in action. The film was twenty-five feet long, but the pictures were only half the linear dimensions of the ordinary or standard film; thus the user was able to get an effect equal to that given by the larger apparatus. Each film bore about 700 separate exposures. To develop these films, of course, a large quantity of solution was required, and, for reasons dictated by a desire to economise, he used the accumulated used solutions of ortol, which he required for ordinary work, and added water up to forty ounces. It was slower than when normally compounded, but served the purpose admirably. Mr. Welford likewise passed round a collection of photographs of the Van Dyck procession at Antwerp this autumn, and a group of those taking part in the late excursion of the South London Society to Belgium, with the five Belgian gentlemen who acted as guides at the Botanical Gardens in Brussels.

MR. WELFORD, in the course of some remarks about the ortol developer, said that it exercised a very strong continuing action, one that he had utilised in several ways. It was very difficult to arrest the action of this developer in the



film, and, if one wished to stop density instantly, the plate had to be plunged into the fixing bath. It was a very simple matter to get extra density by holding the plate under the water tap for a while. As soon as the image showed in a plate he had also finished development by transferring the plate to a dish of plain water or holding under the tap. Other developers he knew had a continuing action, but to nothing like the extent of *ortol*.

**Cripplegate Photographic Society.**—September 4.—Mr. Donald A. Nightingale, representing Messrs. John J. Griffin & Sons, Limited, gave a demonstration of

#### KACHIN AS A DEVELOPER.

The lecturer described Kachin as a benzine derivative, bearing in its action on a photographic plate a close resemblance to pyrogallol, but differing markedly in its stability towards light, its resourceful powers as a developing agent, and good keeping qualities. Plates were developed, having been exposed four times the correct time, which, by the addition of bromide, appeared with clear shadows and full density. The combined kachin-hypo development was then demonstrated with great success, this method producing the over-exposed negative with even greater clearness and vigour than the correctly exposed plate possessed. This effect was considered to be due to physical development, which continued after the plate had become apparently fixed. In reply to a question it was stated that with kachin the image appeared rapidly, bringing out nearly all detail at once, and then gathered density more leisurely. This enabled the worker to remove the plate at any time, and so obtain the precise density he required at will.

#### FORTHCOMING EXHIBITIONS.

1899.

- Sept. 22–Nov. 4 ..... Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.
- „ 25–Nov. 11..... Royal Photographic Society. Hon. Secretary, Major-General Waterhouse, 66, Russell-square, W.C.
- October 18–24 ..... Croydon Camera Club. Hon. Secretary, W. H. Rogers, 106, Holmesdale-road, South Norwood.
- „ 22–Nov. 19... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.
- Nov. 27–Dec. 18 ..... American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.
- December 7–9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.
- „ 27–30 ..... Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Correspondence.

\*.\* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\*.\* We do not undertake responsibility for the opinions expressed by our correspondents.

#### MARKINGS IN NEGATIVES.

To the Editors.

GENTLEMEN,—I wish to draw the attention of photographers to an unsuspected cause of finger markings on negatives. These marks caused me a good deal of annoyance in the recent hot weather, so much so that I complained to the plate-makers (one of our leading firms). They disclaimed responsibility for the markings and suggested that some method of working on my part was the cause.

I pointed out to them that we never in our practice touched the surface of the film with our fingers, and yet the strange marks appeared. I opened box after box of plates, took out one from each box, and exposed,

and no sign of marks; yet, immediately we had a large batch to develop, up they came smiling. I resolved to send back the remainder of the batch of plates, and the plate-makers kindly agreed to send me others for them. They appeared in force in the new batch, and I was forced to believe that, somehow or other, the fault was on our side. As they appeared at intervals only, I watched carefully under what conditions, and I found that it was only in hot weather, and only when we had been very busy and had a lot of sitters, also that if development was postponed till the evening or the morning of next day. Suddenly I bethought me of our method of packing the plates, and herein found a complete solution of the mystery. Our practice was to fill the slide, expose, change, putting the plate film down on the glass side of the plate below until the box was full. In hot weather, on a busy day, this was done so rapidly that the perspiration on the back of the plate from the fingers in adjusting the plate into the slide had not time to dry off before another plate was placed on the top of it, thus sealing the wet perspiration between the plate and film; this, with the pressure of the plates on each other, caused the drops of moisture to be squeezed out a little, producing the peculiar want of sharpness in the finger marks, and, as it were, pressing them into the film. Then, again, the action of the moisture only appeared to be detrimental if it got any length of time to act, hence their appearance when the plates lay all day before being developed. By packing the plates film to film all signs of the marks disappeared. The plates were all alike perfectly clean. As I know several photographers who have been troubled with these marks, I thought it right to enter at length into the matter, through your courtesy.

I should also like to hear if any others have been troubled the same way. The plate-makers seem to consider the matter of some importance, as it, no doubt, in some cases has caused them to be blamed innocently. I send you a negative showing the marks. Perhaps you have seen some like them.

Thanking you in anticipation,—I am, yours, &c.,

JAMES NORVAL.

123, New-row, Dunfermline, August 31, 1899.

#### THE CAMERA CLUB JOURNAL AND THE PHOTO-MINIATURE.

To the Editors.

GENTLEMEN,—Re closing sentence of last *Ex Cathedra*, THE BRITISH JOURNAL OF PHOTOGRAPHY, August 11: "The editor of the Camera Club Journal sharply criticises an American publication for treating somewhat perfunctorily of hand-camera work." Ward and I are putting considerable hard work into the *Photo-Miniature*, and hence "felt" the hasty critique in Camera Club Journal of which you speak. Kindly glance over enclosed copy of letter sent to editor of Camera Club Journal, and judge of the reasonableness of his critique.—I am, yours, &c.,

JOHN A. TENNANT.

Tennant & Ward, Publishers.

289, Fourth-avenue, New York, August 19, 1899.

"August 15, 1899.

"To the Editor of the Journal of the Camera Club, London, England.

"DEAR SIR,—Permit a few words of explanation ament your criticism of 'Hand-camera Work' (No. 3, the *Photo-Miniature*) on pp. 119 and 120 of your August issue. You say therein: 'It is good as far as it goes, but it does not go far enough. It treats almost exclusively of the film hand cameras that one identifies with America. It describes the working and construction of these instruments with considerable detail, but says little or nothing of the plate hand cameras of European make, with which really good work can be done.'

"The facts are as follows: In the monograph of forty-one pages less than three and a half pages are devoted to film cameras and the manipulation of films. This proportion cannot be said to be excessive when the popularity and undoubted convenience of film photography are considered. It should also be remembered that hand cameras using roller or cut films are quite as generally employed in England as in America. In fact, the little book was written for the plate hand-camera worker, and film photography was given as small a portion of the space as was consistent with its present and probable future popularity.

"Further, in describing the various sorts of hand cameras, the information given was written to be equally applicable to European and American instruments. With one exception (a plate camera), all the instruments mentioned in the work are obtainable in the English market. The fact that England hand cameras of special manufacture were not specially mentioned arose from the complete failure of English manufacturers to respond to our request for information concerning their manufacture.

"A glance over the few pages of the book will show that its contents concern the plate hand camera fully as much or more than the film instrument. Thus pages 1 and 2 are given up to a general introduction to the subject, pages 3 and 4 to the Choice of a Camera and Essential Features. In these the film camera is not mentioned, except as follows: 'Others, taking up photography in a more serious way, or perhaps, with some little knowledge of its methods, seek a camera in the use of which they may combine pleasure and usefulness for a definite purpose. In such cases expense should be subordinated to the fitness of the instrument for the purpose in mind, and a "folding" or "film" camera, with suitable movements or "attachments" is indicated.' Surely



this mention of the film instrument was reasonable and just. Pages 5, 6, 7, and 8 are devoted to Fixed-focus Cameras, The Meaning of Fixed Focus, and Varieties of Fixed-focus Cameras. No mention of films is here made, except the assertion that many cameras of this type may now be had in which roller or cut films may be used as well as plates. This assertion is amply supported by facts. Pages 9 and 10 are given up to film photography almost entirely, under the captions Cartridge Films, Cut Films, and the Keeping Quality of Films. Of the reasonableness of this I have already spoken. The pages following this treat of the subjoined divisions: Adjustable Focus and Folding Cameras, Portability, Focussing Screen and Swing Back, Folding Front and Focussing Scale, Estimating Distances, View-finders, Reflecting and Twin-lens Cameras, Testing the Finder, Angle of View, Rising and Falling Front, Lenses, Anastigmats, Experiments, Exposure Shutters, Tripods. Knowing your Camera, Blue Spectacles, How to Hold the Camera, Exposure, A Common Fault, Exposure Factors, Plates, Comparative Light Values, Exposure Guides, Eder's Exposure Table, Stops and Exposure, Development, In the Dark Room, Over and Under-exposure, Formulae, Tank Development. In all these twenty-six pages there is no mention of films. The thirty-seventh page is wholly devoted to the development of roller films—a difficult matter, well worthy of the space given up to it, as all users of film cameras will agree.

"The thirty-eighth, thirty-ninth, fortieth, and forty-first pages (and) are occupied with When to Stop Developing, Cooling the Developer, Fixing, Intensification and Reduction of Negatives, and a list of books useful to the hand camerist.

"The essential preliminaries of hand-camera work being thus fairly and fully explained, the writer of the monograph informed his readers that the choice and treatment of various subjects would be dealt with in a future number (No. IV.: 'Photography Outdoors') of the *Photo-Miniature*.

"Again you say: 'The pamphlet reads more like an advertisement for a particular make of camera than a guide to hand-camera work generally.'

"I am peculiarly sensitive to this critique, which I consider manifestly unfair, and damaging (even in its untruth) to the *Photo-Miniature*. Perhaps it is difficult to avoid such a criticism in publishing a work wherein commercial articles in common use are described by name. Nevertheless, this description was deliberate, and honestly presented for the information of the reader, prefaced by the following explanation on the second page of the monograph.

"And, since hand-camera work to-day is inseparably connected with apparatus and conveniences which are articles of commerce, I will freely mention such instruments and helps as are pertinent to the matter in hand, without fear of being accused of indulging in advertisement, which, as a matter of course, I desire to avoid in these pages.

"Surely this explanation, and the reasonableness of its argument, should be sufficient to prevent such an unjust criticism as the one quoted—whether from a reader of the work or a reviewer.

"Finally, you say: 'We notice one serious mistake among the essential parts to a hand camera, which should be insisted upon, is mentioned a swing back. Every experienced worker knows that a swing back is not only unnecessary, but it is an absolute drawback in hand-camera work.'

"Against this I quote from the work itself: 'Among other essentials I may mention . . . double swing back for all cameras for plates larger than 4x5 inches' (page 4).

"And again, in the paragraph devoted to 'Focussing Screen and Swing Back,' the writer says:—

"A 'swing' is rarely needed in cameras for plates less than 5x7 inches. The swing movement is not by any means an essential feature for strictly hand-camera work, and, personally, I have found it more bother than it is worth, save in exceptional cases, and then it is very useful—as in architectural work.

"This, I believe, fully acquits the writer of 'Hand-camera Work' of the 'serious mistake' imputed to him by your reviewer. As every 'experienced worker' knows, the man who finds himself obliged to photograph a building in a narrow street, and cannot get further back than the entrance-step to the house across the way, will need a swing back, even on a 4x5 hand camera, to get the lines of his building true in the photograph. The occasional usefulness of the swing back in instruments for plates 5x7 inches or larger is a plain fact which no 'experienced worker' would care to deny, if he valued his reputation. Of the disadvantages of the swing back in strictly hand-camera work, the *Photo-Miniature* is explicit.

"Trusting that you will, as a matter of justice, find space wherein to put this explanation before the readers of your valued *Journal*,—I am, yours, &c.,

JOHN A. TENNANT.

## THE VALUE OF LENSES.

To the Editors.

GENTLEMEN,—Ament the remarks of "Free Lance" on the "small margin of loss" re lenses with an unknown name v. Ross or Dallmeyer, and selling the same second hand, let me tell him, I have had a little experience in these matters, and can assure him he is "out of it entirely." The "margin of loss" is, as a rule, considerably more than the first cost of the "unknown." Take, for instance, a best quality French make half-plate R.R. lens, and pit it against an English ditto. I have tried both, and found very little difference in the quality of the negative. Now, let "Free Lance" sell the two second hand, both in similar condition, he will soon find where the small (?) margin of loss is. The loss on the former at the outside would not be more than 17s. 6d., whereas he would do exceedingly well if he lost no less than 2l. on the latter.—I am, yours, &c.,

LENS.

## HOT-WEATHER PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—In your number of July 28 I see that "Cosmos" apparently approves the giving up of practical photography in England when the temperature rises to 80° or 90° in the dark room, and it makes me wonder what he would say to "practical photography" in India (southern) where one's dark room practically never gets down to the above temperature!

Just to encourage the dilettante amateur, who feels it "too hot even to talk" at 80°, I should like to give a *résumé* of an Indian amateur's work during the month of June last: Firstly, he travelled 2000 and odd miles by rail with the thermometer in the carriage showing daily temperatures up to 108.5 for many hours in the day, cooling down to 99° by ten p.m., when it was time to turn in for the night. The journey took five days, and, on arriving at his destination (where he stayed three weeks), he found that the first ten days presented nothing but dust, heat, and haze, while the remainder, for a variety, exhibited nothing but mist and rain.

During the three weeks he went out some ten times with his camera, and on three occasions his attempts were carried on under an umbrella with a maoinioah over himself and camera, while the rain simply came down in sheets, at about the rate of five inches an hour.

He exposed altogether four dozen plates and then packed up, returned the 2000 miles, and within three days had developed the lot; the ordinary shade temperature was a good bit over 100° every day during development, but what it was in the dark room could only be guessed by the state of moisture (inside and out) in which this amateur passed the hours of toil.

Within ten days he had printed some twelve dozen silver prints from these negatives, and, in addition, a complete set in platinum for himself—the others were to give away.

Out of four dozen exposures forty-four negatives are good enough to print from, and I send you a few of the good and indifferent to look at.

To finish my tale, this unfortunate (so "Cosmos" would apparently call him) amateur didn't think he had done anything out of the way.—I am, yours, &c.,

August 16, 1899.

PHOTOGRAPHY OVER 100°.

## PHOTOGRAPHY IN THE BRITISH MUSEUM.

To the Editors.

GENTLEMEN,—For some time past you have been agitating for increased facilities for photographing at the British Museum, and during the past week or so I notice the *Times* has also taken the matter up, and considerable discussion has been going on in their correspondence columns. One of the letters is contributed by Mr. Horace Hart, of the Oxford University Printing Press, who claims that the University authorities have solved the difficulty at the Bodleian Library here. Now, I don't suppose for a minute that the writer wishes to mislead any portion of the public in this matter, and yet his letter is decidedly misleading, for, instead of providing "increased facilities" for photographing in the Bodleian Library, the Curators have practically given a trade monopoly to the photographic department of the O. U. Clarendon Press, and closed its doors to local professionals. I sincerely hope that this lead will not be followed by the British Museum authorities, and trust that the Royal Photographic Society will give the matter their close attention, and see that photographers, both amateur and professional, will not be deprived of the advantage of being able to take their own negatives when they choose to do so.—I am, yours, &c.,

HENRY T. LEACH.

8, Turl-street, Oxford, September 1, 1899.

## THE HUDDERSFIELD EXHIBITION.

To the Editors.

GENTLEMEN,—The Committee of the Huddersfield Municipal Art Gallery have approached our Society with a view of holding an Exhibition of pictorial photographs to consist of a loan collection and an open class (no awards will be given) on similar lines to those adopted at Bradford last year.

Our Society has decided to accept their invitation, and, with a view to assisting them, has appointed a committee to work in conjunction with that of the Art Gallery.

It is proposed to open the Exhibition on December 11, for a period of six or eight weeks.

We are about to communicate with all the best-known workers, and shall be glad to be favoured with your assistance both personally and through the columns of your paper. All communications may be addressed to

W. A. BEVERES (President).

Cloth Hall-street, Huddersfield, September 4, 1899.



## Answers to Correspondents.

\* \* *All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.*

\* \* *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

\* \* *Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.*

### PHOTOGRAPH REGISTERED:—

W. J. Gray, 171, Cromwell-road, Peterborough.—*Photograph of threshing operations.*

VIEWED; D. E., and others.—In our next.

BAZAAR.—The only thing we can suggest is a summons for illegal detention of the photographs. Matters such as this are best dealt with through a solicitor.

ADDRESS WANTED.—STEREO asks, "Will you please let me know the address of Underwood & Underwood, stereoscopic-view publishers (the London address)?"—In reply: 26, Red Lion-square, W.C.

R. M.—1. You are not liable in the circumstances, but you run some risk, as the photograph may be registered at any time and then an action might lie. 2. Yes; but at some risk, as above indicated.

D. G.—In a case such as that described legal action is the only thing we can suggest. Write the man with a threat to sue him for the detention of the negative, and we have no doubt it will be forthcoming.

DISPUTED AGREEMENT.—AZO. Better consult a solicitor. From what we can gather from your letter, the law is in favour of the operator, and against you, and we may say, if we can say it without giving offence, we hope it is.

COPYRIGHT.—DOUBTFUL. Under the circumstances it would not be the slightest use to register the copyright with the view to legal proceedings. As the author of the work (your father) has been dead over seven years, the copyright has expired.

D.—1. You would find the adaptation of incandescent gaslight for portraiture both safe and easy. 2. Messrs. Thorn & Huddle, of Tothill-street, Westminster, make a speciality of the acetylene light for photographic purposes. Better write them for particulars.

BOOKS WANTED.—PRO says: "Would you be so kind as to inform me of (1) a good book on posing and lighting in studio, and also (2) a book on retouching?"—In reply: 1. Messrs. Dawbarn & Ward publish such a book by Inglia. 2. To be obtained of Messrs. Marion & Co., Soho-square, W.

DISCOLOURED PLATINOTYPE.—S. R. J. sends us a vignettéd platinotype print in which the lights have become discoloured, and asks the reason, or whether it is not a "bromide." The print is a platinotype, and the cause of the discolouration is that it was imperfectly fixed—i.e., the iron salts not thoroughly removed by the acid baths.

RED TONES ON BROMIDE PRINTS.—DOWNTONIAN writes: "I wish to produce some bromide prints in Bortolozzi tint (red). Will you give me a hint how to do this?"—In our issue for March 24 is an article by Mr. E. W. Foxlee on the production of colours on Velox. Probably the formulae there given will answer with the paper you are using.

STEREOSCOPIC PHOTOGRAPHY.—W. BRAL asks: "If I copy a half-plate landscape or portrait with a binocular camera, ought I not to get a picture that would show the usual stereoscopic relief when viewed in the stereoscope? I have tried it, but find such is not the case."—That is only what was to be expected. Two dissimilar pictures from a flat surface cannot be expected to show stereoscopic relief.

CRAZY COLLODION.—G. BOOKER sends us a glass plate, coated with enamel collodion, which he made himself, and asks the cause of the crazy-like surface. The cause is that the collodion was made with solvents that were not strong enough, i.e., contained too much water. If ether, with a specific gravity of .730, and spirit of .829 be used, there will be no crappiness in the film, supposing, of course, that a good sample of pyroxyline is used.

ENAMELLING.—G. FULLER says: "Would you kindly inform me the proper proportion of ether, collodion, and alcohol for making the mixture used in the enamelling process?"—Equal parts of ether and alcohol. The specific gravity of the former should not be more than about .730, and the latter .820. By collodion we presume pyroxyline is meant. The proportion of that depends upon its character, but about six grains to the ounce of solvent will be about right.

COMMENCING BUSINESS.—E. HOLBECK writes: "Will you kindly tell me whether you would advise me to begin a photographic business in October with the dull winter in prospect, or would it be better to wait until the spring, when brighter days might bring more sitters?"—Something must depend upon the neighbourhood. If you commence now, you will have the opportunity of making the quality of your work known before the bright weather sets in and more sitters are to be had. You will then have saved time in establishing yourself before the busy season commences.

STUDIO BUILDING.—W. H. R. says, "I am going to put a glass roof into a top room, there is already a good side light, so the walls would be left undisturbed. Should I have to give any notice to the town surveyor, as if not it would save the fee?"—We should think not under the circumstances, as there would be no structural alterations. Something may, however, depend upon the by-laws of the town council, and whether the alterations can be seen from the street.

REMOVING VARNISH FROM NEGATIVE.—T. COPPING. Yes, the varnish can be removed. Supposing it be the ordinary negative varnish, the solvent of which is alcohol, proceed as follows: Place the negative in a dish of methylated spirit, and let it soak for an hour or so, then rub the surface with a tuft of cotton-wool. If this does not get the varnish off, repeat the soaking in fresh spirit, and, if it is still refractory, add a small quantity of caustic potash to the spirit and repeat the treatment.

ARTIFICIAL LIGHT FOR STUDIO.—S. J. says: "I want to take portraits at night in my studio, but I want a cheap, yet good, light for the purpose and free from danger. The electric light is, no doubt, the best; but that is quite out of the question with me, on account of the cost."—In reply: We should, in this case, recommend the flashlight—magnesium powder, used in one or other of the lamps advertised for the purpose. That is free from danger and yields a good light.

IMPERFECT FIXATION.—R. & G. say: "Herewith we send you a couple of views that have been in our show-case all the summer. You will see that the skies have turned to a faint purple brown. The prints were made on —'s P.O.P. Is it usual for this paper to go in that way when exposed for a few months to a strong light?"—No, unless, as in this case, the prints are not properly fixed. With any paper, if the prints are not properly fixed, they will discolour with a prolonged exposure to light.

REMOVING LEAVES FROM A TREE.—SHADOW says: "Can you tell me of a chemical that would, when dissolved in water and squirted over the leaves of a tree from a syringe, kill those leaves? If this is not a photographic question, it is a photographer's question, and is mixed up very much with the result of his work. I shall therefore feel obliged if you can help me."—We have had little experience in this direction, but we imagine that diluted sulphuric or hydrochloric acid would kill the leaves; so, we expect, would a solution of a caustic alkali, such as caustic soda or caustic potash.

DISCOLOURED METOL.—S. A. says: "I have been recently making up formulae for bromide work, but, on dissolving the metol, the solution turned brown, attaining in a few hours the colour of port wine; I have tried twice, but with same results, and even some developer the local chemist made for me went the same. I have thoroughly washed the bottles and measures, and cannot account for it. Can you suggest the cause?"—If the solution was made according to the recognised formulae, we cannot account for the trouble, unless the solution was made in dirty vessels or the sulphite of soda was at fault.

WARPED DARK SLIDE.—C. C. C. writes: "The other day one of my dark slides accidentally fell into the washing tank and was not discovered till some hours afterwards. It was then wiped and stood open in the sun to dry. Now, one of the shutters is so warped that it will not close with any amount of persuasion. Can you tell me what to do with it?"—The simplest thing will be to send the slide to the maker to have a new shutter. You might, however, try this: remove the shutter from the slide and soak it in water for an hour or so, wipe it, and then let it dry slowly under pressure, so as to keep it flat the while.

COUNTY COURT PROCEDURE.—E. L. says: "I have several customers in many parts of the country who are in my debt for large and small accounts, and should be obliged if, through your Correspondence columns, you would inform me whether I can send summons through the post, or whether it is imperative that I should take summons out in debtor's district, say Leicester."—In reply: We have not much experience of county-court business, but we believe you take out the summonses in your own district and have them locally served on the debtor, wherever he may reside. However, ask the registrar or some other official of the county court nearest to you, and he will put you in the way of the correct procedure.

CHLORIDE OF GOLD.—STEVEN says: "1. I have been making gold chloride with powdered gold—hydrochloric, 4; nitric, 1. How many grains of this gold should I use to be equivalent to the commercial chloride of Johnson's? Also best way to neutralise the solution? 2. Some years ago I made the neutral oxalate of potassium by mixing two chemicals. Can you give me formula? 3. I have a solution of metallic gold they contain. Presuming the gold you use is pure, the calculation is easy for the quantity you dissolve at a time. Neutralise with a little pure carbonate of lime. 2. Mix together a solution of oxalic acid and one of carbonate of potash, until the solution is neutral, then crystallise."

VARIOUS QUERIES.—CONDENSER says: "1. Will plain zinc dishes stain bromide enlargements (I mean for developing, fixing, and washing)? 2. Would you kindly give me a pyro-soda formula for stand development of instantaneous exposures? 3. I have an enlarging lantern, in which I burn acetylene gas. The condenser is only a four-and-a-half inch. Could I enlarge without a condenser by diffusing the light with ground glass or other means, as this condenser is not, of course, large enough for a 5 x 4 or half-plate?"—1. Zinc dishes are not suitable for hypo solutions, as the metal decomposes the hypo. Neither are they for photographic purposes generally, unless the metal is protected with an inert varnish. 2. See pages 284, 285 of the ALMANAC. 3. Yes, but the exposure will be very prolonged, as several thicknesses of the ground glass would be necessary to equally diffuse the small strong light of the acetylene. We should advise you to get a larger condenser.



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## THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1900.

Edited by THOMAS BEDDING, F.R.P.S.

THE thirty-ninth annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1 next. Its preparation is already receiving attention. This year's ALMANAC reached a total of 1508 pages, and the entire edition of 20,500 copies was sold out within about three months of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past ALMANACS have been received is the surest proof that the lines upon which that publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1900. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the ALMANAC in directions which may occur to our readers as susceptible of improvement.

The ALMANAC for 1900 will appeal to photographers all the world over as a daily reference guide in practical work. The formulæ will be revised where necessary, and the latest de-

partures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages of the 1900 ALMANAC. Those of our friends intending to co-operate with us in this respect will oblige us by letting us have their MS., sketches, &c., at the earliest possible date.

Secretaries of societies will also oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us as early as possible.

The publishers ask us to remind advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

## EX CATHEDRÂ.

THE private view of the Royal Photographic Society's Exhibition takes place on Saturday September 23. The usual *Conversazione* will be held on the evening of the same day, and the Exhibition opens to the public on Monday week, September 25.

\* \* \*

WE understand that over eleven hundred photographs, &c., were last week sent in for the Exhibition. Upon being passed before the Selecting Committee we are informed that about two-thirds of the number were rejected. The fact that such a large collection of work was submitted for exhibition—and we are under the impression that it is the largest offered to the Society for several years past—clearly shows that there is no diminution of the general desire on the part of photographers to have their work hung at the most important and representative Exhibition of the year.



COLOUR PHOTOGRAPHY will probably figure rather more prominently than usual at the Exhibition, Messrs. Sanger Shepherd and E. Senior having sent in examples by the superposed film and Lippmann processes respectively. The Apparatus Section is likely to be larger than hitherto. With regard to the pictorial exhibits, if we may come to a general conclusion as a result of an inspection of a considerable number of photographs submitted to the Selecting Committee, we should say that the Exhibition will be good and level in quality, and free from the sombre eccentricities and monstrosities of portraiture which disfigured last year's display. The time has gone by when we looked for something startling or sensational at Pall Mall, and we can scarcely anticipate anything of the sort this year. Nevertheless, we have no doubt that the Exhibition will not fail to keep up its reputation for giving photographers material for much discussion and disagreement during the coming months.

AND, indeed, quite a promising start has been made in the printed war of words which annually acts as a kind of accompaniment to the progress of the Exhibition. We believe that our own contributions to these discussions never lack candour and frankness. The plainness and impartiality of criticism with which we are enabled to invest our references to the Exhibition and its system of management could only proceed from that complete disinterestedness of position which we alone of the weekly photographic press consistently occupy towards the Exhibition. In this matter we have always sought to keep a free hand. We have year after year refused nomination for the office of Judge, and we have declined to co-operate in the hanging or selection of the pictures. We have been guided in this policy by a desire to be absolutely unfettered in our critical treatment of the photographs hung on the walls; and, moreover, while we have prized the opportunity of taking this unbiassed and independent view of matters, we have also been animated by a keen anxiety not to place before the readers of this JOURNAL any criticism or opinion which was not the deliverance of an impartial mind, entirely uninfluenced by views formed in the exercise of the office of judge, selector, or hanger. In fine, we regard the annual Exhibition of the Royal Photographic Society as of such prime importance to the photographic world that we consider participation in its management as incompatible with that perfect freedom of critical comment which the readers of a photographic journal naturally look for.

THIS attitude of absolute independence towards the Exhibition is, we believe, greatly appreciated by our readers, who annually make us the recipients of many kindly recognitions of our outspokenness. It was from this point of view that a fortnight ago we considered it our duty to commend the action of the Society in denying to the Judges of its Exhibition the right, hitherto perfunctorily exercised, of revising the work of the Selecting Committee and going over those photographs which the latter body had considered ineligible for exhibition. In recent years it has been hard to discover what benefit accrued to the Exhibition by the inclusion of the Judges among the Selecting Committee, unless it be that it gave opportunity to one, or at most two, of those gentlemen to place among the exhibits a few of the hundreds of rejected photographs which accorded with their own personal predilections as to what

constituted presentable work in pictorial photography, and of rejecting those which did not—not an unmixed benefit. In this respect, if we are credibly informed, the Judges were of little or no practical assistance in the real work of selection beyond the extent indicated.

BUT, on the other hand, the Society's Exhibition suffered positive harm and indignity by conceding to some of the Judges this privilege of selection. Two or three gentlemen elected to serve on the Royal Photographic Society's Jury have also officiated as members of the Selecting Committee of another and contemporaneous Exhibition, and it is an open secret that the knowledge of what was sent into Pall Mall was utilised in a variety of ways scarcely to the advantage of the older Exhibition. In other words, there was the humiliating spectacle of the organizers of a rival and unfriendly Exhibition, conducted on entirely irresponsible lines, having a "finger in the pie" of the one great representative photographic Exhibition of the year held under the auspices of the principal photographic society of the world. We have a mass of evidence to prove the great dissatisfaction which existed amongst contributors to the Royal Photographic Society's Exhibition—and especially amongst members of the Society—at the co-operation of those self-constituted leaders of "pictorial" photography, whom the complaisance of a trustful electorate has permitted to have a hand in the affairs of a Society with which they are entirely out of sympathy. It is no secret that last year at least two of the awards gave the very greatest dissatisfaction indeed, and a repetition of a similar course of action this year will surely provoke a protest.

THIS year it was decided that the Selecting Committee should do the entire work of selection. As we have hinted, there were good grounds for this decision. It appears to be overlooked by some persons that the Royal Photographic Society is entitled to manage its Exhibition in the way it thinks best calculated to promote the objects of the Society and the interests of its exhibitors. The idea that it is likely to amend its regulations at the hysterical admonition of total outsiders, chagrined to find that they are not to be permitted to do as they like with the work of photographers not oversollicitous for their intervention, is too absurd for a moment's consideration. If any of the Judges were (or are) dissatisfied with the conditions under which they are asked to judge the Exhibition, there is no law which compels them to officiate. They can decline to act. So far as we know, they are not bound to serve against their will. The prospectus has been before them for some months. It clearly and concisely indicates their functions in the first line of the fourth paragraph, "Medals will be placed at the disposal of the Judges." The duty of these gentlemen is obviously to award or withhold those medals at their discretion. We take it that, if any one of them, even at the eleventh hour, should find himself unable to perform that duty, his colleagues will cheerfully release him from his obligation.

OUR readers may take it from us that a recent scream that the contributors to the R.P.S. Exhibition have been "hood-winked," because some of the Judges have been rigidly confined to the duties they were chosen to perform and not allowed



to participate in the selection, is only symptomatic of that kind of hysterics which an angry lady sometimes indulges in when she cannot have her own way. The best cure for that sort of thing is the good old plan of taking no notice. We have every confidence that the Selecting Committee will not pass over any work which has a reasonable claim to acceptance. At one time or another we have engaged in exhibition work of various kinds with all the members of the Committee who collectively may be relied upon to bring to their task an amount of acumen, clear common sense, and non-partisanship which is the best equipment for their functions. It may not be an ideal Committee. Combinations of the kind are not easily to be had, and, if they are scarce at Pall Mall, we must be allowed to say, deliberately, that they are no more plentiful in Piccadilly. We assure our readers near and far that this year's Selecting Committee of the R.P.S. Exhibition is, on the whole, well qualified for its work. Exception may be taken to individual members of it, but collectively they are tolerably certain to exercise their function of selection with an intelligence and catholicity of judgment which are not always discernible in persons with higher pretensions to rank as judges of pictorial photography.

\* \* \*

We have received the prospectus and time-table of the Bolt Court Technical School, 6, Bolt-court, Fleet-street, E.C. The first term of the fifth session commences on Monday, October 2 next. The Director of the school is Mr. Charles W. Gamble, and in the prospectus before us full information is given as to fees, hours, and days of classes, and in other respects all other necessary details are specified for the guidance of those desirous of taking advantage of the London County Council's effort to provide the fullest facilities for a practical study of photo-mechanical work. The "process" portion of the syllabus deals exhaustively with the various branches of tone and line work, collotype, and colour (photogravure excepted). We recommend those interested to apply at the address of the school, given above, for a copy of the prospectus.

\* \* \*

FROM General Lloyd, an ardent stereoscopic worker, we have received a print from a decidedly curious and uncommon binocular negative. It is a stereoscopic print of lightning, taken during an electrical storm at Tunbridge Wells in August last. Viewed in the stereoscope, the ribbon-like flash stands out in perfect, if slight, relief, thus showing that the discharge could not have been at a very great distance from the camera, which was fitted with a pair of lenses separated at the usual distance of about three inches. It is the first binocular photograph of such a subject that has come into our possession, and is obviously a most interesting specimen.

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His many friends in all parts of the world will be sorry to learn that Mr. A. L. Henderson has been somewhat seriously ill with a prostrate trouble. For more than two months past he has been unable to follow up his photographic work. At the present moment he is an inmate of a nursing home at the West-end of London, and it is hoped that the best of attention and the highest surgical skill will shortly restore him to per-

fect health. In the mean time Mr. Henderson is assured of widespread sympathy at being placed temporarily *hors de combat*, and the knowledge that everybody will rejoice to see him about again, well and strong and full of his usual energy and enthusiasm.

\* \* \*

In the days that are gone Miall's gelatine dry plates deservedly held a high place in the estimation of the photographic public. They occupied the market from about 1878 till 1886, and we hear them well spoken of by good judges even to this day. Since the year last named Mr. Frank Miall has devoted himself to photographic cabinet work, but he has now decided to return to the manufacture of gelatine dry plates. Mr. Miall, whose address is 13, Shelgate-road, Clapham Junction, S.W., has only to turn out plates as good as those to which he accustomed the public fourteen or fifteen years ago to reap success at the hands of a new generation of photographers.

#### CURIOSITIES OF LIGHT AND SIGHT.

In the phenomena of light and vision no class of persons can have a deeper interest than photographers. The whole superstructure of photography is built upon the properties of light in affecting sensitive compounds of silver, but the manner in which light acts in the formation of the photographic image, as well as the exact way in which the haloid salts are affected by the impact of the spectrum rays, are still so far from being thoroughly understood, that the entire subject is surrounded by an amount of mystery which in its fascination appeals alike to the imagination and the speculatively experimental researches of the inquiring student. Light, moreover, has to be considered not merely as a form of energy which is probably electrical in its origin, if not in its nature, but as the prime source of all the engaging marvels of the subjective phenomena of colour, and thus a further interest attaches to its study. In other words, light and colour, physically considered, are one and the same thing, and a close examination of one or the other can scarcely be carried out on independent lines. There is no light without colour, or colour without light—an elementary fact which, we fear, is not grasped by any but a small proportion of modern photographers.

To the scarce literature of this interesting subject, a useful addition has recently been made by Mr. Shelford Bidwell, M.A., F.R.S.,\* and we have no hesitation in recommending the book as an extremely valuable one for the library of the photographer who makes a study of the physics of his subject a matter of paramount concern. Mr. Bidwell is to lecture at the Camera Club on the 26th, on a portion of the subject with which the book under notice proceeds to deal, viz., "Illusions and Anomalies of Vision," and we have no doubt at all that he will rivet the attention of his hearers as firmly as he has done that of the larger public, to which our contemporary, *Nature*, appeals, and in the columns of which classic publication Mr. Bidwell has for years past discoursed with a lucidity not too common amongst scientific writers upon his favourite themes.

Meanwhile, let us lay bare the salient points of a book into

\* *Curiosities of Light and Sight*, by Shelford Bidwell, M.A., LL.B., F.R.S., with 50 illustrations. 226 pp. London: Swan Sonnenschein & Co., Ltd., Paternoster-square.



which we have dipped with rare pleasure. Founded upon lectures which the author has delivered before various societies, the book has an easy conversational charm of style which, though constituting it extremely simple and pleasant reading, nevertheless, leaves you at the end of its perusal satisfied at having had several valuable lessons in physics presented to you in a readily comprehensible form. The opening chapter outlines the undulatory theory of light by the aid of many homely similes, and what is meant by wave-lengths could not be expounded in a clearer fashion. Wave-lengths "differ from one another only as the billows of the Atlantic differ from the ripples on the surface of a pond." Here we have the long and the short of the matter put with inimitable conciseness. In the same chapter the optics of that imperfect optical instrument, the eye, are dealt with in a similarly lucid way, although the author falls into a common mistake of saying that the eye bears a close resemblance to a photographic camera (? and lens) in the formation of an image. Both systems, of course, form images of objects situated axially to them; but the photographic lens lacks the cardinal function of "accommodation," and in other respects, as we have elsewhere pointed out, the resemblance between the eye and the photographic lens is not so close as it is popularly supposed to be.

Colour and its perception, which forms the theme of the second chapter, gives the reader a very clear exposition of the Young-Helmholtz theory of colour vision, and, though Mr. Bidwell concludes that "the true fundamental colour sensations, if such really exist at all, cannot yet be regarded as finally settled," we recommend the chapter to the student of three-colour photography as a simple exposition of the principles upon which trichromatic processes are necessarily based. Many curious phenomena are dealt with in succeeding chapters on optical defects of the human eye; optical illusions and curiosities of vision. They all tend to emphasise the fact that the eye is not to be depended upon when it comes to estimate size, shape, distance, or form; its powers of accurate perception are very limited, and are influenced, if not governed, by the imaginativeness of the individual. In other words, what we see and what we think we see are two different things. As to Mr. Bidwell's speculation, that "possibly the human eye is at present in process of transformation from an inferior type to a different and more perfect one," we must point out that the education of the eye forms no part of the modern scholastic curriculum, and that defective vision appears to be on the increase with all classes of the community. We can, nevertheless, heartily recommend Mr. Bidwell's book as full of interesting and suggestive matter on the subjects of light and vision.

It is interesting to speculate as to how human vision would be exercised were the eye, instead of being an admittedly imperfect optical system with the aberrations that commonly characterise it—astigmatism, curvature of field, and spherical aberration, to name the three universal defects, adding thereto colour blindness to a greater or less extent—were the eye comparable to a well-corrected modern anastigmatic lens. In such case should we be conscious of seeing better than we do at present? We may assume that in its corrected form the crystalline lens would transmit sharper images of external objects to the brain, and that the mental impression of the colour and definition of what we look at would be acuter than it is at present.

But is an optically perfected eye a necessity? "With all

its anomalies the eye fulfils its proper functions very perfectly," says Mr. Shelford Bidwell; "the more so, perhaps, because it is under the influence and control of the mind. If anything is more remarkable," adds Mr. Bidwell, "then the ease and certainty with which we have learnt to interpret ocular indications when they are in some sort of conformity with external objects, it is the pertinacity with which we refuse to be misled when our eyes are doing their best to deceive us. In our earliest years we began to find out that we must not believe all we saw. Experience gradually taught us that on certain points, and under certain circumstances, the indications of our organs of vision were uniformly meaningless or fallacious, and we soon discovered that it would save us trouble, and add to the comfort of life, if we cultivated a habit of completely ignoring all such visual sensations as were of no practical value. In this most of us have been remarkably successful; so much so, that if from motives of curiosity, or for the sake of scientific experiment, we wish to direct our attention to the sensations in question, and to see things as they actually appear, we can only do so with the greatest difficulty; sometimes, indeed, not at all, unless with the assistance of some specially contrived artifice."

The little book is full of equally suggestive points on the phenomena of light and vision, and we can cordially recommend it to our readers. We have not space to give more than a few indications of the nature of its fascinating contents.

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**Cathode Rays.**—In a paper in *Wiedemann's Annalen*, Herr A. Wehnelt, the inventor of the electrolytic break, which promises almost to revolutionise the practice of Röntgen-ray work, gives the result of his recent experiment with cathode rays. There is always a certain amount of lack of sharpness in these skiographs; but, seeing that they are virtually simply the result of shadows of opaque objects, this is necessarily inseparable from linear radiations whose focus is not a point. However, Herr Wehnelt's results may help in this direction. He differentiates the rays into two classes: "one produced by rays emerging from the cathode normal to its surface, and crossing each other at a focus in the case of a curved cathode; the other consisting always of upright shadows thrown by rays travelling in a direction parallel to the axis of the tube." Our extract is from the columns of *Nature*, and tends to a little confusion of idea, possibly through the medium of translation.

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**Improved Optical Conditions in Photo-micrography.**—At a recent meeting of the Royal Society of Edinburgh Mr. W. Forgan exhibited his practical method of enlarging and deepening the field of a compound microscope. We have no practical acquaintance with his method; but, if actual practice should bear out the claims advanced, it would amount almost to a revolution in optical conditions. The essence of the new plan consists in shortening the distance between the object-glass and the eye-piece, and thus enlarging the field, though reducing the amount of enlargement, the optical arrangement, to a certain extent, resembling that of a telescope. It was stated that the depth of focus obtained was remarkable. The main question to be answered is, Is the depth of focus greater than would be obtained with the use of an objective of longer focus and the normal length of tube, for it is evident that, *ceteris paribus*, the longer the equivalent focus of an objective the greater the distance between the planes between which objects are virtually in focus?

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**Ammoniacal Nitrate of Silver.**—The use of this salt dates back to some of the earliest days of photographic practice.



though one hears little of it nowadays, the usual conditions in printing processes, for example, being just the opposite to those obtained with the use of such a bath in sensitising albumenised paper. Yet we have obtained results with albumenised paper surpassing what we could obtain by any other method. The great drawback to the plan is the liability of the paper to yellow in so much shorter a space of time than when the paper is sensitised on a neutral bath, not to speak of the after-use of citric acid. Our plan was to divide the solution of silver into two parts, add ammonia to one until the precipitate was just redissolved, and then to add the second moiety of silver solution and redissolve the new precipitate by the cautious addition of nitric acid. MM. Berthelot and Delépine lately presented to the Paris Academy of Sciences an account of their investigation upon ammoniacal nitrate of silver, and they find it to consist in reality of the nitrate of a complex stable ammoniated base forming two stable salts in solution. This base is as powerful as the mineral alkalies.

**A Bull Fight in a Church.**—We have often referred to the use that the Rev. W. Carlile, of St. Mary-at-Hill Church, Monument, makes of the lantern at his Sunday-evening services, and how it is appreciated by those who attend; but the subjects dealt with have been of a rather different character from that announced for Sunday last, which was, "Boulogne Bull Fights," with limelight illustrations, and probably it attracted a good attendance. No doubt, this subject, with the pictures, was chosen as an object-lesson to teach a moral and to attract a congregation, but, to say the least of it, was a little sensational. If illustrations of a bull fight, with all its revolting details, why not those of a prize fight? It would be sure to attract, and many who attended might, doubtless, heed the moral. Some, however, will probably consider that lantern illustrations of bull fights are better suited for music halls than for a church, notwithstanding the moral to be taught.

**Dangerous Photography.**—Photographers frequently run dangerous risks in the pursuit of their art. It comes to us that an amateur, forming one of a picnic party, who was arranging his camera at Jackdaw Crag, Boston Spa, slipped and fell a distance of 100 feet, with the result that he is now lying in the infirmary suffering from concussion of the brain. We have often seen photographers, engrossed in their work, running very great risks, shifting the camera from place to place in order to get the best view, heedless for the time of what may be behind them. We even confess to having done the same thing ourselves and narrowly escaped an accident. Photographers should be very cautious, when working in precipitous places, not to forget, while they are absorbed in their work, that they are on dangerous ground while moving the camera from place to place. We call special attention to this matter, as many are now taking their holidays on photography bent.

**Confiscated Cinematograph Films.**—According to a weekly lay contemporary, the films for a series of "living pictures" of the Dreyfus court martial, which were intended for the Empire Theatre, South Shields, have been confiscated by the French Government. If this be true, it is difficult to conceive for what reason. Photography by means of "living pictures" could show nothing that the French Government need be ashamed of, one would think. The case might possibly be different if the living pictures could depict what was said, and the way it was said, by some of the Army witnesses in the case—some of the generals, for example. Perhaps, however, it is as well that the films were confiscated, judging from what took place at some of the music halls on Saturday night when the verdict was known, and reference made to it during the performances. It is not well that photography should be made the means of holding up our neighbours' internal affairs to ridicule.

#### KEW OBSERVATORY AND THE NATIONAL PHYSICAL LABORATORY.

TWELVE thousand pounds to cover initial expenditure in buildings, and a further annual subvention of 4000*l.* a year, has been voted for the establishment of the new Physical Laboratory, and, as the governing body of Kew Observatory are willing to become merged in it, and will thus bring into the funds 458*l.* per annum from the Gassiot Trust, with a certainty of at least 2700*l.* per annum from standardising fees, the institution will start with every prospect of success. It may be remembered that the purposes of the new body are stated in the accepted recommendation of the Committee appointed by the Treasury, Lord Rayleigh being Chairman; they are, "the establishment of a public institution for standardising and verifying instruments, for testing materials, and for the determination of constants. The work of the Kew Observatory in this direction is perhaps best known by its verifications of thermometers, though one might expect that, among photographers at least, its testing of lenses might be most familiar; but, as a matter of fact, the number of photographic lenses sent to Kew is decidedly disappointing. It is true that the modern anastigmatic type of lens, being at present in the hands of a few makers only, and they of the very first rank, renders a Kew certificate almost useless; but there are still an immense number of single lenses, and lenses of the rectilinear or "symmetrical" type, and those only who have had such pass through their hands know the vast difference that exists between the instruments of various makers. As a sign of the time, we notice one maker to the trade publishes a separate list of rectilinear lenses which he guarantees to pass the Kew examination, which, indeed, he offers to have carried out on any lens purchased under this list.

#### PHOTOGRAPHY IN LEGAL CASES.

MORE than once we have alluded to the use to which photography has been put in the celebrated Dreyfus case, and, we are sorry to say, according to the newspaper reports, not in the interests of truth and justice. We have, most of us, read of the evidence given by Bertillon, an official photographer and pseudo expert in handwriting, and his absurd theories. But in this case it seems that our art was only invoked to prove, or, in the opinion of most people in this country, to endeavour to prove the guilt of the unfortunate man Dreyfus, and not to promote justice. Such uses are more or less a libel on photography. In cases where disputed handwriting or signatures are in question, it would be best to show photographic enlargements, on a large scale, of the documents supposed fictitious and genuine.

The lantern has been suggested for the purpose, but in law courts a darkened room is not available, and, even if it were, it would not be so good as enlarged facsimiles on paper, inasmuch as with the lantern only one reproduction could be seen at a time, whereas with enlargements several could be placed before the Court, the judge, and the jury, while the experts in handwriting, *pro* and *con*, could explain the similarity or dissimilarity of the writing in the disputed documents, while the Court had the comparative reproductions before them. Some short time back we had the opportunity of seeing, *sub rosa*, some enlargements of documents—admittedly genuine and one alleged fraudulent. The originals were about six inches long, and they were enlarged to something like five feet, and separate enlargements were made of the signatures themselves to much larger dimensions. The result was that the case never came into Court at all, the enlarged photographs settled the case. Handwriting experts' evidence is generally discounted in law cases, but when enlargements of signatures, say, from two inches to thirty or forty inches, are before it, the Court can then generally form its own opinion, particularly when assisted by the experts engaged by the different disputants. Bromide enlargements are quickly and comparatively cheaply made, and are well suited for the purpose.

#### THE METRIC SYSTEM AGAIN.

THERE is no question that, sooner or later, the metric system of weights and measures must be adopted in this country. At the Conference of the Associated Chambers of Commerce at Belfast last week, under the presidency of Sir Stafford Northcote, M.P., no less than five resolutions relating to the metric system appeared on the agenda. These were from Birmingham, London, Bristol, and Leicester Chambers; but, with the acquiescence of the delegates, only one motion, covering the whole ques-



tion, was proposed. It was to this effect, that the Association again affirms that the metric system of weights and measures should be made compulsory in the United Kingdom, and strongly advises Her Majesty's Government to use it in all Government departments. The resolution was adopted, with an addition to the effect that each trade organization should be asked to use its influence with the School Boards within its district to have the system properly taught, as now authorised in the Code.

The present system, as used in this country and in America, is open to many objections, and the metric is not free from some; but it would be a great advantage to trading interests if there were uniformity throughout the world. As the metric system is more largely used all through the world, it is not likely that that will be changed, and as it is only in Britain and America that our system is in vogue, it would seem that it is we who should make the alteration for the sake of uniformity. We are glad to see that many photographic manufacturers—plate-makers, for example—are now issuing their formulae under both systems. Universal uniformity alike, both in weights, measures, and scales, is most desirable. Take, for example, thermometer scales; three are in use on some parts of the Continent. In France, for example, the Centigrade, with  $100^\circ$  between the freezing and boiling points of water; in Germany the Réaumur, with  $80^\circ$  between the freezing and boiling points; here and in America the Fahrenheit, in which the difference between these points is  $180^\circ$ . In the two former the zero is the freezing point of water; in the last-named it is  $32^\circ$  below that. This shows the confusion that exists in the different thermometer scales. Wherever the metric system is in vogue the barometer scale is quoted in millimetres; here it is in inches. This would, of course, be remedied if the metric system were adopted here.

#### THE ORIGIN AND HISTORY OF CERTAIN TRIPLE ANASTIGMATS.\*

EMIL VON HOËGH attributed the fact that double objectives, composed of two systems of triple lenses, each being separately corrected, both spherically and astigmatically, have received so much attention during the last few years, to the doubts as to their practicability, which had existed up to that time. The first form† the so-called "double anastigmat" of Goerz, contains two typically different forms of construction. One (fig. 15) consists of a biconcave lens of flint glass of medium refraction (1.57) enclosed between two other lenses, one of lower refraction (1.51) and one of higher refraction (1.61), both positive. In consequence of this peculiarity of construction, two forms are conceivable; in one case the first lens may be the one of lower refraction (fig. 15A), in the other one of higher refraction (fig. 15B). The first form produces a lens spherically and astigmatically corrected, of positive focal length; the second form can only be spherically and astigmatically corrected for a negative focal length. In both cases the spherical error is removed by the first cemented surface (Z—S), and anastigmatic flatness of image is produced by the second (S—Z).

The second form of construction (fig. 16) consists of a positive lens of medium refraction (1.57) enclosed between two negative lenses, one of which is of lower refraction (1.51) and the other of higher refraction (1.61). Here, again, two forms are conceivable, *a* and *b*, of which one (*a*) produces an anastigmat of positive focal length, and the other (*b*) a similar one of negative focal length. Here, in both cases, the first cemented surface (S—Z) corrects the astigmatic error, and the second surface (Z—S) the spherical error.

Soon after the publication of Goerz's patent, Von Hoëgh set himself the problem of discovering whether, among the many conceivable combinations of the triple lens, which include the action of opposite surfaces there were any (besides those already attempted and proved practicable, which could render possible the simultaneous correction of the two errors here illustrated. He came to the conclusion, after a whole course of calculations, that all the combinations which he had tried, with the exception of two, which stood in close relation to those already known, excluded the possibility of eliminating both errors. These two types of objective, regarded purely from the exterior, result directly from those of the double anastigmat if the two lenses, connected by the spherically corrective cemented surface, are subjoined in the inverted order of the third lens. Figs. 17 and 18 show these two forms. In this combination

figs. *a* produce an anastigmat of positive focal length; figs. *b* of negative focal length. The reason of the above-stated fact (viz., that in all other types of the triple lens, especially also in the triple meniscus systems, the obtaining of the correction of the image is impossible) is that the existence of a cemented surface of a positive type, acting simultaneously with a surface of a negative type does not suffice for the correction of this error. These surfaces only produce extension of the image without increasing the astigmatism when they maintain in their system a curve in opposition to the incident light, so that the principal ray strikes the surface at a comparatively large angle, while it is indifferent to the correction of the spherical error at the axis (but at the axis only), which direction the required surface maintains. With respect to these circumstances, the conditions for the simultaneous correction of spherical and astigmatic errors in a triple lens are as follows:—

The presence of a cemented surface acting collectively, and of reacting descriptively, further (*a*) in lenses of positive focal length a biconvex lens of higher refraction, or a biconcave lens of lower refraction; (*b*) in lenses of negative focal length, a biconvex lens of lower refraction, or a biconcave lens of higher refraction. With this, the list of those forms of construction of the triple-lens system, which render possible the elimination of both errors, is exhausted. This is also true of systems formed of four or more lenses, as there is then a corresponding number of cemented surfaces acting in the same way. If we leave out the combinations of negative focal length which have not any great practical value, there remain four constructive forms of the anastigmatic principle among the triple lens combinations. We have not yet treated of the chromatic error. In consequence of the abundance of glass material produced by the Jena Glass Works, this error may be eliminated in all four combinations, as that glass may be selected for one zone at least of the objective aperture. The above-named conditions do not by any means ensure a good photographic objective.

There are always errors in every system in a greater or less degree, which disappear in the double objective, but have great effect on the action of a single objective. The most important errors of this kind are as follows:—

1. The error in the rays of the middle zone, which remains after the elimination of the spherical error of the ray of highest incidence.
2. The chromatic difference of the spherical aberration, i.e., the spherical aberration remaining in the light when it has been removed for the chemical rays, and conversely.
3. The degree of aberration from apochromatism, i.e., the correction of the error of colours for as many colours as possible, an error the correction of which is closely connected with that of two others and depends on the use of flint glass and crown glass, the spectra of which advance in the different regions as nearly proportionately as possible.
4. The deviation from flatness of field in the directions of rays other from those in which, in the ideal field, the two astigmatic points are brought to a junction.
5. The difference, arising in the directions of rays between the centre and edge of the image.

The above-named errors appear in the double objective as well as in the single objective, while the following errors are not perceptible in the double objective on account of the symmetrical adjustment.

6. The amount of deviation from the fulfilment of the one sine condition, i.e., the requirement that, if possible, the cones of all the rays, of whatever height of incidence, shall produce images of equal size from one element of plane in the image field.
7. The chromatic difference of the sine condition.
8. The chromatic difference of the deviation (*Ablenkung*) of the principal ray falling obliquely, or the different size of the image of objects lying side by side in the case of the smallest aperture regarded as a point.
9. The distortion (i.e., the aberration from the point of contact with the plane of the image) of the rays falling parallel to the principal ray in the greatest contrast to the same.

The above-named numerous errors have not been yet considered after the fulfilment of the chief conditions, and it would be an impossible, or, at least, an unlikely, coincidence to find them all corrected simultaneously in any one form of construction. The preference must therefore be given to that form of construction in which the most important errors occur in a small degree only, or are occasionally entirely removed even.

The simultaneous correction of errors Nos. 2 to 5 in the above list, in the form of construction presented in fig. 15, decides the question as to which form is the best to choose, since it was found to be most important to produce a double objective of large aperture answering as many requirements as possible.

\* Continued from p. 551, September 1. Communicated by Philip E. B. Jourdain. The references to figures here (*x*) correspond to figures *x*+3 in Eder's *Jahrbuch*, 1897, pp. 76 and 77.

† D. R.-P., 74,437.



Unlike this, the form in fig. 16 acts unfavourably as a double objective on account of its insufficient powers of correction of errors Nos. 2 and 3, although in the single system it has the advantage that errors Nos. 6 and 9 occur in a substantially slight degree. Nevertheless, this advantage, occurring only in the single lens, by no means equals those just mentioned as belonging to form No. 1. And this same form of the double anastigmat has essential advantages also over the other form in fig. 17. Both forms are pretty much alike in respect to errors Nos. 1 to 3. In the form in fig. 17, on account of the unfavourable position of the dispersive cemented surface (it is placed opposite to the incident light), all the other errors, and especially those in connexion with the single lens, have an essentially disturbing effect. The last form (fig. 18) has not yet been treated of. This would be more impracticable than the third form (fig. 17), and would stand in the same relation to it that the two constructive forms of the double anastigmat do to each other.

In conclusion, Von Höegh "ventured to express his opinion" that, in the forms of double anastigmat, not all indeed, but by far the most favourable, forms of the triple-lens anastigmat have been discovered.

DOROTHEA FEVERIL TURNBULL.

### THE PHOTOGRAPHY OF COLOUR.

[Paper read before the Royal Photographic Society, and published in its Journal.]

THE Photography of Colour, the title of the subject I have the honour of bringing before you this evening, is a wide one, but I propose to speak of only two of its many branches: (1) the representation of a coloured object in a monochrome print and (2) the representation of a coloured object in its natural colours by what is generally known as the three-colour process.

In June last I read a paper here on the translation of colour into monochrome, and in the previous November I reviewed the various then known methods of triple printing. I have no startling new principle to bring before you, but wish rather to describe to you what has been done since then in the matter of improvements and simplification of detail, the adaptations of these methods to commercial ends.

Forty years have passed since colour photography had its birth, and for the last twenty-three years we have had, hidden away in our plates, the power of securing photographic action by all the colours of the visible spectrum, although we did not understand how such action could be controlled so as to ensure a correct result, and the time has now arrived when scientific and commercial enterprise should be ready with the materials for the general practice of photography as a means of correct representation of colour, whether as colour or in a monochrome print.

#### WHAT IS A CORRECT REPRESENTATION IN MONOCHROME?

To deal with the first head of my subject it is necessary to clear the way by defining what I mean by a correct representation of a coloured object in a monochrome print. Think for one moment what we are trying to do. Our coloured object really has two scales of contrasts—contrasts of colour and contrasts of light and shade—but obviously we cannot represent contrasts of colour in black and white, so our work is narrowed down to correctly representing light and shade.

I now have on the screen the spectrum of white light, and also a slide in which I have represented the apparent brightness or luminosity of the various parts of the spectrum to the human eye by varying depths of the light and shade. A perfect photograph of the spectrum should give us, then, a result something like this, but the top transparency in the next slide, which is from a photograph of the spectrum taken on a Cadett ordinary plate, shows us how far away from truth the ordinary photograph really is, as you see nearly all the action has taken place in the blue and invisible violet, the highest luminosity of the spectrum, i.e., in the yellow being represented as black. The photograph below it is of the same spectrum, taken at the same time on the Cadett rapid spectrum plate. Here the result is a little better, but still far away from our copy.

It is clear from these facts that what we have to do is to secure such photographic action upon our plates as will give us densities in our negatives directly proportional to the visual intensities of the light reflected from the object, ignoring altogether the colours of the object, no matter what they may be.

We have seen what the perfect result should be like and the result of the best plate we have without a filter, and our inquiry is now narrowed down to finding out how to cut out the action of the invisible violet, and subdue the action of the blue and green, so as to bring the visual and photographic impressions into harmony.

#### ABNEY'S COLOUR SENSITOMETER.

The correct representation of colour, according to luminosity, has been the dream of all lovers of photography for very many years, but the practical difficulties in the commercial production of plates and correct light filters were so great that it is only during the last two months that the photographic public have been enabled to obtain, in a commercial

sense, the necessary materials for this purpose, that is to say, a plate and screen correctly adjusted to each other.

This result has been brought about by Captain Abney's invention of the colour sensitometer. Before this invention the few of us who made approximately perfect colour filters had to photograph the spectrum through various media, and then measure the light transmitted through the various parts of the spectrum negative. For each trial negative we had to go through the measurements again, and the method was very tedious and required far too much time to be practical from a commercial point of view.

Captain Abney's invention has altered the case, and by its means quite as accurate, if not more accurate, results can be obtained, and yet the light can be sold at a reasonable price commercially.

The principle of the sensitometer is this: we take, say, four coloured glasses, which cut the spectrum into fairly definite portions—a red, a yellow, a green, and a blue—and also a white glass, and accurately measure the luminosity of the light coming through those glasses in relation to white light, then reduce the light coming through the glasses to a common luminosity, i.e., that of the darkest of the series, by means of a sector with varying apertures arranged to rotate between the glasses and the source of light; then, provided the glasses are illuminated by exactly the same quality of light as that in which their luminosities were measured, a negative taken through a perfect light filter should represent all five patches by deposits of equal density.

Obviously by this method we can test a number of filters in a very short time when once we have the apparatus correctly set up, and, by means of a repeating back, a dozen exposures can be made on one plate and developed together, a glance at the negative showing us the amount of success obtained.

The very greatest care must necessarily be taken in the construction of the apparatus and in the measurements of the luminosities of the glasses in the first instance, as upon these measurements the accuracy of every filter depends.

#### MEASUREMENT OF LUMINOSITIES.

We had to devise the most perfect apparatus we could for measuring the luminosities, and this apparatus was shown and fully described at the Camera Club lately by Mr. James Cadett. The actual test glasses were selected with every care from fired glasses, so as to ensure the greatest purity consistent with high luminosity and permanency, and the measurements used as a basis for computing the relative apertures of the sector were the means of a large number of separate estimations. I should observe that the measurements are made by varying the aperture of a pair of sectors whilst rotating at 4000 revolutions a minute, and, as the apertures of the sectors cannot be read until the motor has been stopped, it is impossible for the observer to be prejudiced in his estimates by previous readings.

To show how consistent these repeated measurements were, I append a table of some of the measurements of three of the glasses used:—

Red.	Green.	Blue.
$9\frac{8}{10}$ .....	20 .....	$2\frac{1}{2}$
$9\frac{9}{10}$ .....	20 .....	$2\frac{1}{2}$
$9\frac{10}{10}$ .....	20 .....	$2\frac{1}{2}$
10 .....	20 .....	$2\frac{1}{2}$
$9\frac{11}{10}$ .....	20 .....	$2\frac{1}{2}$
$9\frac{12}{10}$ .....	20 $\frac{1}{2}$ .....	$2\frac{1}{2}$
$9\frac{13}{10}$ .....	20 .....	$2\frac{1}{2}$
	20 .....	
	21 .....	
	20 .....	

White being 100.

I should say that all the measurements were by the crater of direct current electric arc light, and the same lamp and current were used in the final test of every filter.

#### FILTERS.

Having the apparatus in perfect order, we set to work on the filters, and, after a considerable amount of experimental work, succeeded in getting all the patches of equal density.

Then, and not till then, we tried the filter and plate on an object in the camera; our first attempt was on this colour chart which, with prints from the resulting negative, I will pass round. I will also pass round the result from the same copy on the Cadett ordinary plate, without the screen.

I should like to make a remark or two about some curiosities of the actual manufacture. The screen consists of four components, two films of coloured gelatine coated on worked glass, and two collodion films, the whole being cemented together in optical contact with Canada balsam. Naturally every care is taken to get each film as nearly the correct tint of colour as possible, but, with every care, the visual test is of very little value. The film is cutting out what the eye does not see, and many of the most perfect filters vary considerably to the eye, whilst of a batch of ten filters which, to the eye, appear all exactly alike, perhaps four or five will be too far out to pass.

Some critics have remarked that, even if we did succeed in getting the correct translation of colour directly proportional to luminosity, we should



not be able to satisfy the artist in the matter of copying paintings, because where, say, a red and a green of the same luminosity came together, the photograph would represent them by equal depth of grey. This is true, but it is also a fact that, granted an artist place two colours of exactly the same luminosity side by side—a thing I have never seen in a painting yet—if we purposely alter our filter so as to differentiate between them, we also alter the relations of every other tone in the picture, and probably destroy all its harmony of light and shade.

I should say that the filter increases exposure about twenty times in good studio light and about forty times on open landscape. Some objection has been taken to such an increase in exposure over what we have been used to in what was called orthochromatic photography, but this filter only just does its work for the most rapid plate we have. Of course, if you are satisfied with representing red as black, you may use a very much lighter filter. One I have here only increases exposure about four times with the Cadett plate, and yet has a wonderful effect in improving blue sky in a landscape, but I do not myself approve of such compromise, and, if a perfect result is possible, I want that or nothing.

#### TRIPLE PRINTING.

I now come to the second branch of my subject, that of triple printing; and, as there are, perhaps, some persons present who are not acquainted with the general principles which underlie this process, you will pardon me if I briefly recapitulate them.

The triple printing process is based upon the fact that all the colours of the spectrum, and therefore all the colours of nature, may be counterfeited sufficiently nearly to deceive the human eye by mixtures of three colours of the spectrum itself, a particular red, green, and blue.

By mixing lights of these three colours we get a close approximation to white light. Taking one of these colours, say red, and placing it before the source of light, you see that a piece of bright blue paper, illuminated by light coming through it, looks black, bright green paper looks almost black, and red paper looks nearly the same as white. Therefore, if we photograph a picture or any object through a red-colour filter, any red object would be represented by full density in the resulting negative, and, of course, every white object would be represented the same. Then, if we take another photograph through a green glass, the green objects will be represented nearly the same as white, and similarly with the blue filter. Therefore, by photographing through filters of these three colours we get the separate colour components of the picture represented by varying densities, white objects being the same in all three.

Three transparencies made from such negatives, and projected in superposition upon a white screen by red, green, and blue-violet coloured lights, will give a representation of the object photographed in its natural colours, as Mr. Ives has shown us in this room several times by means of his kromskop lantern.

#### MEASUREMENT OF COLOUR FILTERS.

Up to this point I have been speaking in a very loose way of taking photographs through red, green, and blue glasses.

Obviously, from what we saw just now with regard to the sensitiveness of the photographic plate with reference to the human eye, some modification of the taking colour filters must be necessary to adapt them to the relative colour sensitiveness of the plate used. Hitherto this alteration has been a matter of trial and error, and, although in skilful hands very good results may be obtained, as the photochromoscope has proved, it is obviously very much more satisfying to work from actual measurements.

It would be commercially impossible to take a number of spectrum photographs with each set of colour filters and measure them, and, from what I have told you with reference to the orthochromatic filters, you will appreciate the total incompetency of the human eye as a test.

Captain Abney has suggested how this actual measurement might be accomplished by a modification of his colour sensitometer, and I want to describe to you how the colour filters which I now hand round have been worked out in accordance with his method, and adjusted for use with the Cadett rapid spectrum plate.

As all the measurements must be made with reference to the reproduction colours, we first of all settle on what these shall be. The first thing to do is to make three standard colour filters, cutting the spectrum into as sharp narrow bands as possible, one in the red, about the line C, another near the line E, and another near the line G, every care being taken to get these as perfect as possible. If the three glasses are cut into the form of sectors of equal dimensions, mounted in a frame, and rapidly rotated in front of a beam of white light, we shall be able to form a very good idea of their suitability for our purpose by comparing the emergent beam with another beam of light from the same source lowered to equal luminosity by a rotating sector.

In my own practice I use a piece of apparatus which divides a beam of light coming from the crater of a direct current electric arc light into four parts. Three of the resulting beams are arranged to overlap on a small square of white plaster, and the fourth beam falls on a similar square close to the first. Each of the three overlapping beams is fitted with one of the standard coloured glasses, and the beams are then adjusted so as to give a white patch. The fourth beam is then reduced

to equal luminosity, so that we have two patches side by side of equal luminosity, one illuminated by the crater of the arc white light, and the other by white light reconstituted from our three reproduction colours.

#### TEST GLASSES.

As we did for the orthochromatic filter, we have now to do with this. Select a set of test glasses to form our sensitometer, say, a good red, an orange, a yellow, chrome green, signal green, a good blue and white glass. We then place one of these glasses in the fourth or normal white light beam, and, by means of a rotating sector in the beams of our reconstituted white light, make a match. All the glasses are measured in this way, and the apertures of the sectors carefully recorded.

Having got these measurements, all that we have to do is to mount the glasses in a row, and then work out three sectors, one for the red, one for the green, and one for the blue filter, in such a manner that each sector shall reduce the luminosity of the particular colour—red, green, or blue—to the luminosity of the lowest luminosity of that colour in the series of glasses.

The test glasses are mounted in a box containing the shaft for the rotating sectors, and the sector for all three colours filter red, green and blue are interchangeable on the shaft, so as to ensure the condition of illumination being the same for all.

Having such an apparatus set up and illuminated by the crater of the electric arc light similar to that used for making the measurements, all that remains to be done is to make each colour filter of such coloured media that, when used with its proper sector, all the test glasses shall be represented in a negative by deposits of equal density.

One precaution must, however, be observed, the exposure given must be short, well within what Messrs. Hurter & Driffield call the straight-line period of exposure for the particular batch of emulsion used, as, with the least over-exposure, all the images of the colour patches even up in a very surprising manner, and a very bad filter might, on such a test, be considered good enough to pass.

Our next slide illustrates the selective action of the three-colour filters. The first vertical row shows actual colour patches of red, green, greenish-blue, and yellow glasses, and side by side I have mounted actual negatives of this row of glasses taken through red, green, and blue colour filters upon the Cadett rapid spectrum plate.

#### PRINTING IN INKS.

Now, if we print from these three negatives in superposition in pure red, green, and blue, such as used by Mr. Ives in his projection experiments, we should not get a facsimile of our copy, for, instead of adding coloured light to coloured light, our second and third impressions laid over the first would cut out what the first passed, and the result would be not white, but black. Therefore, in order to print either as superimposed film lantern slides in colliotype or from type printing blocks, it is necessary to print in inks not of the pure spectrum colours, but in their complementaries, that is to say, in pigments passing two of the three colours we used to form our reconstituted white light, and absorbing the third. The primary colours for pigment printing, therefore, are not red, green, and blue, but greenish-blue, pink, or bluish-red, and yellow, or, as Captain Abney describes them, red, green, blue.

I have here three long slides, graded from one end, which is white, to the other in full strength of these three colours, and I will show you in the lantern how, by various combinations, we can reproduce every tint and shade of colour.

If we take these three negatives through our red, green, and blue filters respectively, and print from them in these three colours, we shall get a facsimile of the object photographed. I will now show you upon the screen three prints of a Japanese fan separately. They look very harsh and crude, but, as we superpose them, you see we get a representation of the object in its natural colours, with all its semi tints and light and shade correctly rendered.

I next show you a three-colour print, which I value very highly, as it was made by Mr. F. E. Ives nearly five years ago; then follow some slides by Mr. Saville Kent, who is well known for the excellent work he has done in many branches of photography, and more especially for the work he did on the Great Barrier Reef in Australia in connexion with corals and biological subjects. He has lately been experimenting with this three-colour transparent pigment process for lantern-slide work, and I am very pleased to be able to show you a few of his beautiful results.

We not only want to print in colours, but in these days we want to print rapidly and in enormous numbers; to this end we must print on the typographic press, and it is the application of the three-colour printing process to type printing that we want to see more successfully worked.

The practical difficulties of obtaining correct colour filters and inks, and the further difficulty of obtaining anything like a faithful copy of the transparencies by the present half-tone block-making process, have kept back development very much; but, now that we have filters, plates, and inks which will produce good results, I think it is probable that within a very short time we shall see a great increase in the use of the process.



## REGISTRATION OF PRINTS.

It would take too long for me to pass through the lantern a set of slides tracing the production of a triple print, but I have had such a set mounted in a frame, and I will hand it round. It comprises the negatives taken through the colour filters, the transparencies printed in the manner of ordinary lantern slides, the three half-tone negatives made from the transparencies with the line screen crossed at particular angles in order to avoid offensive geometric patterns, the prints from the etched plates in yellow, pink, and greenish-blue ink, and the final result of similar impressions in superposition. The transparent triple-film print from the same negative is considerably more perfect than the paper print, for in the latter we have the ill effects and loss of detail caused by the cross-line screen, and it is, further, unfortunately impossible with the crossed-line screen process to represent a scale of tints accurately; that is to say, there are always two places in the scale of the half-tone where the scale of gradation "jumps," and these two "jumps" will always mar the result. Having got the screens and printing inks to come fairly close together, we must set to work and see if we cannot find some means of overcoming these two "jumps" in the block-making process; once we have succeeded in doing that, I think there will be very little difficulty in producing accurate reproductions by means of this type-printing process, with very little work in the way of fine etching.

It is, of course, absolutely necessary that the three prints should be printed in register, and that is one difficulty which we have to overcome. Quite recently a press has been brought to this country which will print all three impressions at one printing. The principle is this: the three blocks are mounted on a cylinder, and as the cylinder revolves the separate half-tone blocks are inked with their respective inks; the rollers are kept just a trifle away from the cylinder, and as each block comes under its correct roller there is a depression in the edge of the cylinder which allows the printing roller to get on to the block and ink it. As the cylinder travels round, the three blocks are inked with their respective inks, but, instead of their being printed directly on to the paper, the colour from the block is transferred to elastic rollers, which deposit their respective impressions one over another upon a metal plate, and, as the blocks can be adjusted by micrometer screws, absolute register can be ensured. When each roller has deposited its respective coloured image on to the metal plate, the paper comes into contact with the plate and picks up all three inks at once, so that the paper only comes in contact with the printing surface once instead of three times. The whole of the three inks are thus transferred at the same moment, and there is therefore no trouble with the expansion and contraction of the paper, buckling at the edges, or the other difficulties that we have to contend with in printing the separate impressions at different times; indeed, if necessary, the impression might be taken on tissue paper, and still be in perfect register.

## LINE SCREENS.

Another difficulty which we have in printing in a type press arises in connexion with the line screens. A half-tone screen consists of crossed lines, and, if we place another screen on top of it at a small angle, we get a watermark pattern, such as I now show you on the screen, and it is only when the screens are at particular angles that we get a pattern which is not offensive. It is therefore necessary that the three blocks should have the screens crossed at particular angles. If we arranged the screens at such an angle as would give the effect we want, a screen which should be large enough for a  $15 \times 12$  picture could only be used for a  $9 \times 7$ , and, in order to print a  $15 \times 12$  picture, we should require a cross-line screen 19 inches square. Mr. Levy has recently introduced some new screens which get over the difficulty in this way: he rules two screens on glasses of the same thickness, one ruled with lines parallel to the two sides, and the other ruled with lines at  $60^\circ$  and  $120^\circ$  to the sides; then the block from the blue transparency is taken on the first screen, and the block from the red transparency through the other screen, and then, by taking the screen from its holder and turning it round, we can get the third negative with the angle of the lines in the opposite direction.

In this way, with two  $15 \times 12$  screens, we can make  $15 \times 12$  negatives, and there is no necessity for the old trick of having a big revolving copying board to hold the transparencies in order to get these crossing angles.

I have one other convenient piece of apparatus to show—a frame for holding the screens in the camera which has been made for me by Messrs. Penrose.

The spectrum plate is of extreme rapidity, and sensitive to nearly all the range of the visible spectrum, and some people have on this account found it a rather difficult plate to work with ordinary dark-room illumination. I showed last June how that difficulty could be got over by the use of three dyed films, and Messrs. Cadett have followed out that suggestion, and have put on the market a safe light for their plate, a specimen of which I have brought for examination.

There is only one other subject that I wish to mention, and that is the paper for half-tone printing. At the present time we are compelled to use the baryta-coated paper, which very much detracts from the charm of the result. I have lately heard of some experiments in the production of a rag-made paper, with a system of calendering rollers,

which will give results nearly as good as baryta paper, and upon which I believe a little further experiment will enable us to produce prints quite equal to those on the heavily loaded papers of the present time. In the course of a few years, books printed on sulphate-loaded papers will drop to pieces, and it is very unfortunate that our work should be lost in that way. I therefore hope that every endeavour will be made to provide papers upon which our pictures may be printed with some chance of permanency.

E. SANGER SHEPHERD.

## KACHIN.

At the meeting of the London and Provincial Photographic Association, on September 7, Messrs. J. J. Griffin's representative attended to demonstrate and describe the new Kachin developer, which, he said, was one of the benzene derivatives. Apart from its value as a photographic developer, pure and simple, Kachin calls for attention on account of its singular property, compounded with a suitable quantity of hyposulphite of soda, of developing and fixing the photographic image concurrently. Hyposulphite of soda in small traces, however, has not been found to affect the developing properties of Kachin to any noticeable extent, and this fact was commended to certain careless amateurs, who frequently get small quantities of hypo in their other solutions with disastrous results, as a point in favour of the new developer.

The distinctive characteristics and claims put forward on behalf of Kachin are briefly as follow: It evolves all detail, being more energetic than any known developer, but the resulting negatives are perfectly clear and without veil or fog. Extreme softness or contrast may be produced at will. Its developing power is not influenced by admixture with hyposulphite of soda, and by combining the processes of developing and fixing the most brilliant results are secured, making the method a unique remedy for over-exposure and giving greater play in exposure. For some time, it was stated, the makers found difficulty in arriving at a formula which would work with sufficient speed, but finally, by the employment of sodium phosphate, the operation of development was rendered much quicker. The precise action of the sodium phosphate in the developing solution is not quite understood at the present time, but it is sufficient to say, continued the demonstrator, that its presence adds to the speed of the development without producing any different effect in the final result. Other advantages claimed for Kachin are that it is easily soluble in water and is not influenced by temperature. Its use is not accompanied by any staining of the hands or the plates, nor does it have any effect upon the skin. It is very economical, the solutions may be used again and again, and it provides a developer very well suited for the treatment of stale plates. The demonstrator passed round results upon a certain brand of plates two years old, comparing metal with Kachin on similar exposures. Attention was further drawn to the fact that none of the formulae for Kachin included bromide of potassium. Originally it was thought that the new developer was very sensitive to the action of this salt, but it is now stated that the addition of a few drops of a ten per cent. solution, besides imparting to the image a little more vigour, does not prolong development to a very great extent. For over-exposures up to as much as fifty drops of the ten per cent. solution per ounce may be used. Negatives were passed round which had been developed and fixed with a combined solution, and others testifying to the keeping qualities of Kachin. One of these was developed with a fresh solution and the other with some used developer kept in a beaker for two days. A number of other plates were passed round showing the effect of bromide, and comparing with Kachin some of the older developers. Finally, Messrs. Griffin's representative showed the development of some negatives with the new developer.

Mr. Davies said that as a result of his trials he liked Kachin very well as a developer, so much so indeed that he had practically adopted it, not least because it did not stain the skin as did pyro. He went on to say, however, that he had not succeeded very well with the formulae advocated in the instructions, which perhaps might be put down to his carelessness or clumsiness. He disliked the caustic alkali, preferring carbonate of soda. The latter was nicer to handle and, moreover, had one great advantage that it did not induce such frilling as he had noticed in the plates developed that evening, even with several brands of plate. Notwithstanding all this, he had not been troubled by prolonged development. At the outside ten minutes sufficed, even with bromide. He also looked with disfavour upon a method of expressing formulae in not easily comprehended terms, such as was done in the present case. He advocated in preference the ten per cent. system. Kachin kept very well in this form with sodium sulphite. He had failed to detect any advantage from the use of phosphate of soda, and finally said that he appreciated fully the merits of Kachin, but did not like the formula.

Mr. A. Mackie was unable to speak of Kachin from experience, but he supported the suggestion that it should be made up in ten per cent. solutions, so that a ready calculation of the proportion of one ingredient to another might be made. It seemed to him that, whenever new developers were introduced, the makers went out of their way to make the formulae as complicated as possible. He had recently given up pyro for ortol; but, before doing so, he had been compelled to compound his solutions on the same basis as he had previously done for pyro in order



to learn how much of each ingredient was required for a negative of a certain character. The same would apply to Kachin before its comparative value could be ascertained.

Mr. S. H. Fry stated it to be his opinion that a strong reason should always exist for the introduction of new developers. Did he understand that any more cogent reason existed for the adoption of Kachin than that it did not stain the fingers?

The reply given was that Kachin in solution was much more stable than pyro, which had been mentioned. It was understood that the preliminary experiments of the makers had probably been confined to plates of German manufacture, a fact which would account for any modification of formula advisable for users of English plates.

Mr. Fry said the fact that a developer had great keeping qualities appealed to him in a very slight degree. He made his developer to use, not to keep.

The demonstrator pointed out that one had to consider the amateur element in photography. With these it was a common practice to prepare large quantities of solution, and, however long it lasted, it was always expected to give a good account of itself. Taking metol, then, it was well known that that developer would not keep, and he thought that the superior qualities of Kachin in this direction were decidedly one reason for its introduction.

There ensued some discussion on keeping properties, in which that of pyro, hydroquinone, rodinal, and metol was referred to, one member asserting that he had kept the latter well for six months.

Mr. A. Haddon challenged the statement that Kachin was a new developer. Pyro-catechin, which he understood was the same as Kachin, was known more than two years ago. He asked whether it was a necessity to use the caustic alkali with the combined developing and fixing solution, as, if so, he did not think it would ever come into vogue. In some trials he made with a formula published some time back the film in almost every case came away in large pieces through frilling.

It was stated in reply that the makers advocated the use of the caustic alkali, which they considered necessary. The date of the English patent for pyro-catechin was 1891, but before that in Germany. The preparation had not, however, been on the English market. Difficulties in the process of manufacture had to be overcome, and uniform dry crystals were now made.

Replying to a further statement that its developing powers were known long before, it was said that forty years ago it could be obtained in solution; but, though its laboratory production might have been practicable, its commercial preparation and the reduction of the time necessary to a minimum was not arrived at until later.

Mr. Haddon said that he had had a sample in solid form for eighteen years at least, and it was still dry.

### PANORAMIC CAMERAS.

MR. C. SHAW, of Brooklyn, has patented some improvements in panoramic cameras, which are thus described in his specification.

Fig. 1 is a horizontal sectional view of a camera embodying the invention. Fig. 2 is a vertical sectional view of the casing and showing a rear elevation of the camera parts. Fig. 3 is a vertical sectional view. Fig. 4 is a detail cross-sectional view of a lens cylinder and a light shaft. Fig. 5 is a perspective view of the camera.

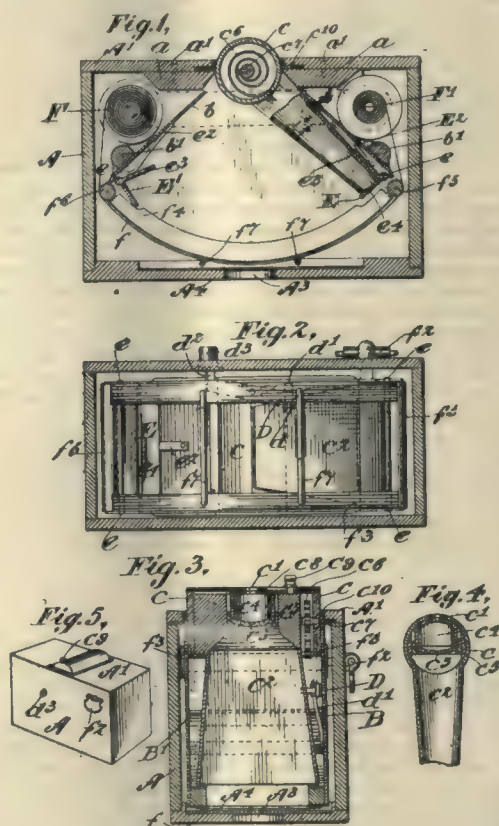
A represents a suitable casing for containing the several parts of the camera. One of its walls, as, for instance, the wall, A<sup>1</sup>, is detachable from the remainder of the casing, says Mr. Shaw, and it is to this wall that I connect two plates, between which plates several parts of the camera mechanism are located and held. This arrangement permits of the working parts of the camera being removed from the casing for examination and the substituting of one film for another.

B<sup>1</sup> represents the two plates that are connected to the wall, A<sup>1</sup>, and which extend outwardly therefrom. These plates are detachably connected to protruding parts, a, of the wall, A<sup>1</sup>. The parts, a, may be integral with the wall, A<sup>1</sup>, or separate therefrom, in which case they are held by screws, a<sup>1</sup>. Between the two plates, B<sup>1</sup>, and at the sides thereof, I locate walls, b. These walls may be supported by standards, b<sup>1</sup>, to which they are secured, and the standards may be held at their ends between the two plates. These standards also serve to support the plates, B<sup>1</sup>, and to space them apart. The purpose of these walls, b, is to exclude light from that part of the film not within the path of movement of a light shaft that is employed in the camera.

c represents a cylinder placed vertically in an opening provided in the wall, A<sup>1</sup>. It is preferably arranged to have a portion projecting beyond the outer surface of the wall, A<sup>1</sup>. It is arranged to oscillate in the opening on journals that are provided in the ends of the cylinder. These journals may conveniently consist of circular plates, c, that fit in the ends of the cylinder, c. These plates may be carried by the plates, B<sup>1</sup>, being secured thereto by any desired means, as, for example, by solder. The cylinder is provided with an opening, c<sup>1</sup>, in that portion of its wall projecting beyond the wall, A, and diametrically opposite this opening is a second opening, into which one end of the light shaft, c<sup>2</sup>, is secured. The light shaft is preferably rectangular in cross section, and

is adapted to move with the cylinder, and it is of such a length as to have its free end move in a plane that is parallel with and adjacent to the film or other sensitised surface used in the camera.

c<sup>3</sup> represents a lens that is carried by a suitable holder, c<sup>4</sup>. The holder, c<sup>4</sup>, is inserted in an opening provided in a wood or other block, c<sup>5</sup>, that is held within the cylinder, c. The lens is placed in the line of the openings in the cylinder, c, so as to project the light rays through the light shaft on to the sensitised surface. When the cylinder, c, carrying the lens, is oscillated with the lens exposed, the light rays from the different parts of the view being photographed will be projected by the lens through the light shaft on to successive portions of the film or plate in the camera as the light shaft is moved in front thereof. The cylinder may be oscillated in one direction by means of a coiled spring, c<sup>6</sup>, that is preferably located within the cylinder. One end of the spring is secured to a stationary part, as, for example, to a pin, c<sup>7</sup>, carried by one of the plates, c, while the other end of the spring may be secured to the cylinder. The cylinder and light shaft may be moved in the other and opposite direction for the purpose of "setting" the lens and light



shaft by hand. When the cylinder is moved in this direction, the spring is placed under tension to move the cylinder and light shaft in the first-mentioned direction, that is, in the direction to expose the film. It is obvious that the speed of the lens cylinder and light shaft may be regulated by changing the tension of the spring. The joint made by the wall of the cylinder and the walls of the opening in the part, A<sup>1</sup>, in which the cylinder is placed, may be made light-proof in any convenient manner, as by felt, c<sup>8</sup>, or metal, which would conform to the wall of the cylinder. Any desired means may be employed for holding the light shaft and cylinder in "set" position and for releasing them from set position. I have shown in the drawings the following arrangement of parts for doing this. A lever, D, is pivoted to the upper plate, B, so as to have one of its ends, d, in the path of movement of the light shaft. As the light shaft is moved to set position this end, d, will be made to engage with the light shaft to hold it against the action of the spring, c<sup>6</sup>. A flat spring, d<sup>1</sup>, is preferably provided for holding the end, d, in the path of movement of the light shaft. The other end, d<sup>2</sup>, of the lever is so arranged as to be engaged by a button d<sup>3</sup>, carried by the casing, A, which, when depressed to engage the end, d<sup>2</sup>, causes the end, d, to move out of engagement with the light shaft. A shutter, c<sup>8</sup>, may be provided in the cylinder to cover the lens when desired, a knob or projection, c<sup>9</sup>, being provided for moving it over the lens after the film has been exposed and the cylinder and light shaft are to be reset. This knob or projection may also be used to move the cylinder and light shaft to set position.

E<sup>1</sup> represent shutters, which are provided for the end of the light



shaft. One of the shutters is provided for closing the end of the light shaft when the camera is in set position, while the other shutter is for closing the end of the light shaft after it has been released from set position and it has moved in front of the film to expose it. With this arrangement of the shutters for the end of the light shaft all light rays from the lens are excluded from the camera while the light shaft is at rest. These shutters are operated automatically and preferably by the light shaft coming into engagement with them. Each shutter may conveniently consist of an L-shaped piece of metal that is provided with a pivot,  $e$ , at each end, which pivots have a bearing in the plates,  $b$  and  $b^1$ . A spring,  $e^2$ , is provided for each shutter for the purpose of holding it in such position as to be operated by the light shaft. These springs are preferably flat ones, and they are secured at one of their ends to the walls,  $b$ . The operation of these shutters is as follows: When the light shaft and cylinder are moved to set position, the light shaft engages with one arm,  $e^2$ , of the shutter, against which the spring,  $e^2$ , bears, and moves it against the action of the spring so as to bring the other arm,  $e^1$ , of the shutter over the open end of the light shaft to completely close it. When the light shaft is released to expose the film, the end of the light shaft moves away from the arm,  $e^1$ , to throw the light rays on to the film. As it moves in front of the film it comes into engagement with the arm,  $e^2$ , of the shutter,  $e^1$ , and moves this arm to cause the arm,  $e^1$ , of this shutter to completely close the end of the light shaft and thus prevent any more light rays entering the interior of the camera. The shutter,  $e^2$ , is then moved over the lens and the cylinder and light shaft reset for another exposure. After the cylinder and light shaft have been reset the shutter,  $e^2$ , is moved from in front of the lens, thus having the camera ready for another exposure. It will be seen, therefore, that the purpose of the shutter,  $e^2$ , is merely to cover the lens while the camera is being reset and also to protect the lens from dust, &c., when not in use.

A film is preferably used in the camera, and provision is made for inserting in the camera the spool, on which the film is generally wound, and unwinding the film from the spool as it is needed on to a second spool.  $r$  represents the spool carrying the film,  $f$ , and  $r^1$  the spool on to which the film is wound. The spool,  $r^1$ , is provided with the usual ratchet and the pawl engaging therewith, and this spool is turned by the usual key,  $f^2$ , carried by the casing,  $a$ .

The rollers,  $r$  and  $r^1$ , are removably held in spring pieces,  $f^2$ , that may be secured to the plates,  $b$  and  $b^1$ , on the outside thereof by rivets, which rivets are located at the middle of the pieces. These pieces are near the wall,  $a^1$ , of the casing, so that the spools will be in the position shown in the drawings. The film from the spool,  $r$ , is passed over a roller,  $f^6$ , journaled in the plates,  $b$  and  $b^1$ , and preferably against curved flanges,  $f^4$ , that are carried by the said plates, and over a roller,  $f^5$ , to the spool,  $r^1$ . Guide rods,  $f^7$ , may also be provided to prevent the film moving away from the flanges while being transferred from one spool to the other. The usual opening,  $a^2$ , and its coloured covering,  $a^4$ , are provided in the casing,  $a$ , in order that the position of an unexposed part of the film may be gauged through the usual marks or signs provided on the backing of the film.

#### PHOTOGRAPHY FOR JOURNALISTS.

JOURNALISTS are only now awakening to the fact that a knowledge of photography is of the greatest advantage to them in their profession. At one time a journalist who could sketch well was always in demand, now the one that can combine a little sketching with photography and the pen is always sure of obtaining a good livelihood. This is largely due to the public's craving for illustrations and the great advance in the half-tone process, which has practically revolutionised the engraver's art.

Of course there are some things that photography cannot very well illustrate, such as—a story. Here the artist will always take first place on account of the difficulty in arranging the sitters to look natural, and the quantity of expensive accessories it would require. I am told that photography is used for illustrating stories in several American papers, but it cannot be called a success, because they are not arranged artistically. Photography will always give a truthful rendering of any object (providing the photograph is not faked), and is preferable to an artist's drawing, as it contains more detail, and exactly depicts the faces contained in it. Suppose, for instance, an artist is sketching "the funeral of Mr. Gladstone," he will draw the principal figures in correctly on the spot, the other parts are filled in afterwards. Here the beauty of a photograph comes in, as it will truthfully reproduce every head and posture of persons contained in the angle of view of the camera lens.

Photography is seen at its best when illustrating articles (for which there is a great demand); here it has a very great advantage over sketching, as it is more rapid, and instantaneous photographs can be taken which will exactly reproduce the motions, &c., of the object written about. Take, for instance, an article on, say, "Barnum's acrobats;" here the actions of the arms and legs could be correctly caught at any stage. Sketching would not be of very great use, as the motions are so very rapid that the eye is very often deceived, and the exact actions of the different muscles at the various stages could not all be drawn, as the eye could not see them all at once to allow of notes being taken. It is also of the greatest aid in newspaper work for illustrating race meetings, regattas, and any great funerals or other functions.

Of course, in newspaper illustrating, the great thing would be to get prints out in time to have the blocks made before going to press, as it would be no use getting them out late, as all interest, or the greater part of it, would be lost were they reproduced several days after the events happened. To do this, the exposed plates must be developed soon after exposing, and well washed, not fixed. A piece of bromide paper should then be soaked in water, laid on top of the negative (film to film), and squeegeed in contact. It must be placed in a printing frame and exposed to gas or lamp light for a few seconds. It may then be peeled off and developed in the usual way, washed, dried, and packed off to the paper at once, the sooner the better. This method will have no bad effect upon the negatives, providing they are afterwards well washed and fixed. The prints from them will be quite as good as they would be were the negatives fixed, but it must be remembered that the negatives will not keep long unless they are thoroughly fixed.

The best kind of camera for the journalist is, no doubt, a hand camera, as it is easily carried and does not take up much room. It has another advantage, and that is, it is always ready for use and requires no setting up or focussing. There are many suitable hand cameras on the market, and no difficulty will be found in choosing one. It will be best, though, to pay a good price and have a reliable one. On the whole, one with a R.R. lens, fixed focus, with magazine mechanism, taking one dozen plates, will be the most useful. Films are lighter, but more expensive, and not so easily manipulated.

Photographers also can considerably add to their income by sending photographs of any interesting event that happens in their district to the weekly or monthly magazines. Newspapers are also open for the same class of photographs, and will pay handsomely for them. Many magazines will also be pleased to receive pretty photographs of figure studies for frontispieces, &c., from photographers who have had a little artistic training. The payment for these is anything from 7s. 6d. to 1l. 1s. each. Another remunerative branch is to send photographs of any celebrities to the papers as soon as their death has been notified. It is to be greatly deplored that so many amateurs will supply editors with photographs gratuitously, simply for the so-called honour of having them reproduced. They in this way spoil the chances of struggling journalists and photographers.

It would be well if so many of the novelists that use photography in connexion with their plots would first get an insight into it. They would then not make such dastardly mistakes as, for instance, a burglar, breaking into a house in the *dead of night*, accidentally knocks the setting-spring of a camera, with the result that his features become imprinted on the plate, and thus enables the police to capture him.

OSBORN THORNBURY.

#### THE LATE GASTON TISSANDIER.

WE learn from Paris that M. Gaston Tissandier, the famous balloonist and scientific writer, has recently died, after a long illness, in his fifty-sixth year. The deceased aeronaut was born in Paris, and, after having studied chemistry and physics with energy, he took to ballooning with his brother Albert. They made nearly fifty ascents together, four being effected during the siege of Paris by the Germans. They were then attached as balloonists to the Army of the Loire. In 1875 the deceased made the famous ascent in the Zenith balloon, which led to the deaths of his two companions, Croce Spinelli and Swel. They went up a tremendous distance—8600 metres, according to French reckoning—and M. Tissandier showed a marvellous resisting power on the occasion. This fatality did not check his ardour, for he soon afterwards made further ascents with his brother. They notably tried an electric navigable balloon about sixteen years since, and obtained thereby some useful results. M. Gaston Tissandier wrote many important scientific treatises in his time, and was a diligent contributor to reviews on chemical, meteorological, and aeronautic subjects. He and his brother also founded *La Nature*, a most useful periodical for all who are interested in the marvels of sea, sky, and land. One of his latest books was the *Martyrs of Science*, and he has left behind some manuscripts which are of great scientific import and value. To the pages of *La Nature* and other French periodicals M. Tissandier at one time contributed many articles on photographic subjects, several of which in former years were translated and published in these pages.

#### THE CAMERA CLUB.

THE following is the list of papers and other fixtures arranged for the first portion of the Camera Club's forthcoming session:—

OCTOBER, 1899.

Monday, 2.—Opening of Exhibition of Pictures of the East, by Mr. E. R. Ashton.

Thursday, 5, 8.15 p.m.—Mr. E. Sanger Shepherd, "Natural Colour Photography."

Monday, 9, 8.15 p.m.—Mr. Lindsay Johnson, M.A., M.B., &c., "Exhibition of a New Phonograph with Musical Selections."



Wednesday, 11, 8.30 p.m.—Ladies' Evening. Exhibition of Lantern Slides, by members of the Field Club.

Thursday, 12, 8.15 p.m.—Captain W. de W. Abney, C.B., F.R.S., &c., subject to be announced later.

Monday, 16, 8.15 p.m.—Mr. Howard Priestman, "A Climber's Holiday in Lofoten."

Thursday, 19, 8.15 p.m.—Mr. James Cadett, "Cloud and Photographic Landscapes."

Monday, 23, 8.15 p.m.—Lecture, to be announced later.

Thursday, 26, 8.15 p.m.—Mr. Sheldford Bidwell, F.R.S., "Illusions and Anomalies of Vision."

Monday, 30, 8.15 p.m.—Mr. Alfred Watkins, "Some Principles of Development."

#### NOVEMBER.

Thursday, 2, 8.15 p.m.—Mr. T. C. Porter, of Eton College, "Scenery in the Canary Islands."

Monday, 6, 8.30 p.m.—Smoking Concert arranged by Mr. Percy Marshall and Dr. Marshall.

The Club Journal states that important alterations have recently been made in the kitchen department of the Club, which will, it is hoped, lead to a marked improvement in the dining-room.

#### LEEDS CAMERA CLUB'S ANNUAL DINNER.

THE Annual Dinner, which practically opens the winter session of the above Club was held on Wednesday, the 6th inst., at the headquarters of the Club, Grand Restaurant, Boar-lane, Leeds, when about sixty members sat down to dinner, the President (Mr. W. J. Warren) being in the chair, and supported by visitors from the following societies: Mr. W. A. Beevers (President, Huddersfield Photographic Society), Major Norwood (Wakefield), the Rev. W. Curtis (Wakefield), and Mr. R. McKay (of the Leeds Photographic Society), and others.

After an excellent dinner had been done full justice to, the President rose to deliver his presidential address, in the course of which he said: As President of the Leeds Camera Club for the ensuing year, his task was not altogether a bed of roses. It seemed to him that a presidential address should be a general review of photography during the past year, and a few tips as to what they should undertake in the future. He had intended to lay the whole science of photography bare before them, but he suddenly remembered this was an after-dinner speech, and, out of charity and affection for the members of the Club, he had decided not to give this knowledge away. They were opening the session of 1899-1900 with every prospect of success, and they were that day (and he said it with malice aforethought, as the lawyers said) the largest Society in Yorkshire. He hoped that each of them who applauded this remark would realise the fact that it was for this very reason they had the greatest responsibilities of any society in Yorkshire, and every member shared that responsibility. The Committee had been working hard for some time in Leeds for the coming session, and he thought he might congratulate them on having a syllabus which was excelled by no society in the kingdom. Every recognised leader of photography would come and speak to them on the special subject for which such lecturer was specially qualified to speak. Referring to the newly formed Yorkshire Union, he said they had resisted the blandishments of Mr. Clough and the Union, as they would remember, and he thought they had profited by standing out in that respect. They would observe a new feature by endeavouring to make the syllabus and handbook something more than a mere list of lectures, and he trusted they would appreciate this new departure.

It had been suggested that the Club was given over to only one branch of photography—the pictorial side.

It is perfectly true that the leaning of the majority of the members was towards that branch of photography, but at the same time let it be known that one of the most important articles of the belief was this, that without good technical photography, without a thorough knowledge of the science, there could be no successful practice of the art, and he would like once and for all to admit that they who practised pictorial photography had every regard, respect, and appreciation for the scientific side of photography. He would also like to point out that in the Club syllabus the majority of the lectures were of a technical kind, because they recognised that all work, whether scientific or artistic, must be associated with a groundwork of technical excellence, and that a man must learn the nature of his tools, and using them feel no hesitation or impediment about the use of them, before he could do any thorough work.

He wished to emphasise the fact that they were looking to promote the prosperity of the Leeds Camera Club and to gain new members; he was glad to say that some sixteen or eighteen new names had been given in since the issue of the Club's handbook.

He promised them that, if in the future the members would help them by coming to the lectures and doing good work—the best work—that next year they should have a far more startling sensation than they had this year. He had in his mind a vision of club rooms where they might hold meetings and spend their evenings, where they might meet on club

nights and at other times; and all this depended absolutely on themselves. If this session was a success, they would come to them on September 6 next year and invite them to club rooms which would be their own. He concluded by wishing everybody good luck in the new session, and he hoped and trusted that they would help the Committee in it.

After the usual loyal and patriotic toasts Major Norwood (Wakefield) proposed "Success to the Club," coupling with it the names of the President, the Hon. Secretary, and Hon. Treasurer, whose work he remarked on behalf of a club with a membership of 190 was no sinecure.

The Rev. W. Curtis (Wakefield) seconded and the toast was replied to by the President and the Secretary (Mr. John H. Gash), and the Treasurer (Mr. F. Rush), the last-named of whom stated the Club was in a flourishing condition. In asking the Company to drink to the toast of the "Press" the President remarked that he felt personally, and he was sure they would all agree with him in his remarks, that the Press had behaved with the greatest kindness to them. Photography was a technical subject and did not appeal to a vast number of readers, yet they appreciated the fact that the Press had treated them well and had endeavoured in every way to meet them.

Every one was indebted to the Press for the liberal manner in which the lectures were reported, and he had very great pleasure in asking them all to drink to the health of the Press.

## Our Editorial Table.

#### TRAPP'S ALBUMENISED PAPERS.

L. Trapp & Co., 29, Budge-row, E.C.

A SAMPLE of Messrs. Trapp's new brand of ready-sensitised albumenised paper was recently tried by us, and found to yield prints of excellent quality. A good albumen print is hard to beat by any other silver printing-out process, and there will always be many adhering to this method of printing whilst such well-prepared as Messrs. Trapp's is available.

The following baths are recommended for the paper:—

Gold Bath.—To be prepared one hour before use:—

Chloride of gold .....	1 grain.
Acetate of soda (cryst.) .....	24 grains.
Carbonate of soda .....	3 "
Water .....	4 to 5 ounces.

A bath required for immediate use may be prepared as follows:—

Chloride of gold .....	1 grain.
Carbonate of soda .....	10 grains.
Water .....	4 to 5 ounces.

Messrs. Trapp also recommend the use of the following gold bath:—

Chloride of gold .....	1 grain.
Carbonate of soda .....	1½ grains.
Borax .....	30 "
Water .....	3 ounces.

Hypo Bath.—1 ounce of hypo to 10 ounces of water.

#### A MERCURY-IODIDE INTENSIFIER.

Agents: L. Gaumont & Co., 25, Cecil-court, Charing Cross-road, W.C.

MESSRS. LUMIÈRE have recently prepared a mercury-iodide, soda-sulphite intensifier, the uses and properties of which they thus describe:—

The use, as an intensifier, of the well-known solution of mercuric iodide in hyposulphite of soda has not hitherto been general, in spite of the remarkable qualities and facility of employment presented by this intensifier, because of the ultimate change occurring to pictures thus intensified; they turn yellow, after a certain period, which occasions a gradual diminution of the intensity of the negative.

Messrs. Lumière have recognised that the solution of mercuric iodide in anhydrous sulphite of soda, while offering the same advantages as the solution in hyposulphite, presents, to a degree notably less than this latter, the phenomenon of ulterior discolouration of the plate.

This advantage in the use of anhydrous sulphite of soda over hyposulphite springs from the fact that an excess of anhydrous sulphite can be used without disadvantage, while intensification ceases in the presence of an excess of hyposulphite. After determining the cause of alteration and staining of the image, we have arrived at completely avoiding this after-effect, by treating the negative, after intensification, with a developer, which, without changing either the colour or intensity of the image, prevents all the subsequent yellowness, and assures its preservation with the initial colour and intensity. Intensification with mercuric iodide, practised under the conditions which we indicate below, solves, therefore, completely the problem of direct intensification.

This intensifier presents the following qualities: 1. It enables intensification to be effected by the use of a single solution, and the action



to be followed closely on the plate, which is impracticable with the ordinary perchloride of mercury intensifier. 2. The intensification may take place when the plate leaves the fixing bath, after a summary wash, without fear of the yellowing of the film, which would infallibly occur with perchloride of mercury if all trace of hypo were not carefully eliminated. 3. Finally, the bath can be rapidly prepared, its components being very easily soluble.

## COMPOSITION FOR NORMAL INTENSIFIER.

Water .....	100 parts.
Anhydrous sulphite of soda .....	10 "
Mercuric iodide .....	1 part.

The instructions are as follows:—

Dissolve the anhydrous sulphite of soda in the water, then add the mercuric iodide. The solution is almost immediately ready. When it is wished to intensify the plate on leaving the fixing bath, it should be briefly washed and then placed in the intensifying solution. If the intensification is to take place on a negative already dry, it is useless to wet it before plunging it in the intensifier. The action is rapid and very regular, and the gradual intensification can be easily followed by examining it against the light, without fear of stains or discolouration as with perchloride of mercury. The rapid action of the intensifier can be restrained at will without changing the final result by the mere addition of water. On the other hand, the energy of the intensifier can be increased by adding a larger quantity of mercuric iodide, together with anhydrous sulphite of soda, but without exceeding the maximum quantities of 2 grammes of mercuric iodide to 20 grammes of anhydrous sulphite of soda. On leaving the intensifying bath, the plate is briefly washed in running water, then plunged for some minutes in one of the following developers, prepared as for an ordinary development: diamidophenol, para-amidophenol, hydramine, pyrogallie acid, hydroquinone, &c. Under these conditions, without altering the intensity of the negative to any appreciable degree, the after-effects mentioned above are avoided. The operation is finished by washing the plate in running water in the ordinary way.

We hope to have an early opportunity of testing this method of intensification.

## KARAMELLO.

Wholesale Agents: Gear, Chidley & Co., 101, Great Portland-street, N.W.

THIS is a substance manufactured by Johnson's Saccharum Company, of Silvertown, which is put forward as a backing for gelatine dry plates. It is of the consistence of treacle, and has all the appearance of being prepared from a caramel base. We found by practical trial that it is easily applied to the back of the plate in a smooth and even layer, dries quickly, and is readily removable by aqueous solutions. As a safeguard against halation in negatives it answers admirably. Karamello should be popular amongst those who make a point of backing their plates.

## STEREOSCOPIC SLIDES.

Underwood & Underwood, 26, Red Lion-square, W.C.

MESSRS. UNDERWOOD have been good enough to send for our acceptance a set of stereoscopic slides illustrative of scenes in Judea. Accompanying the slides is a little book descriptive of the places photographed. This plan of issuing series of slides in geographically arranged sets should help to make stereoscopy increasingly popular. Some eloquent articles on the beauties of stereography, which were written by the late Dr. Oliver Wendell Holmes, have been reprinted in book form by Messrs. Underwood, and they form a magnificent recommendation of this kind of photography.

## CATALOGUE RECEIVED.

James Bamforth, Station-road, Holmfirth, Yorkshire.

MR. BAMFORTH is the largest producer in Great Britain of life-mode studies, and from the negatives so obtained he prepares lantern slides, a supplementary catalogue of which is now before us. This extends to thirty-two pages, and there are four pages of half-tone reproductions of pictures arranged in Mr. Bamforth's studio. He offers a wide selection of subjects, sacred, humorous, and sentimental, and his catalogue should certainly be obtained by all those interested in entertainments by means of the optical lantern.

## News and Notes.

PHOTOGRAPHIC CLUB.—September 20, at eight o'clock. Discussion, "Uncorrected Lens Work."

THE Optics Committee of the National Physical Research Laboratory consists of the following gentlemen: Lord Rayleigh, Captain Abney, Mr. W. H. M. Christie (Astronomer Royal), Professor Clifton, Mr. T. R. Dallmeyer, Professor Fitzgerald, Professor Joly, Mr. T. Matthews, the Earl of Rosse, and Professor Silvanus Thompson.

A FOURTH edition of Mr. W. Thynne Lynn's *Remarkable Eclipses* has been issued by Mr. E. Stanford, and will be found useful, as it contains information as to forthcoming eclipses, notably the solar eclipse of next year.

"CLAM BAKE."—A correspondent tells us that this is a baking of clams, usually on the seashore. Clams—certain forms of shell fish, bivalves. The bake is a huge fire, a heap, *à la Vesuvius*. The "feed" is understood to be fit for the gods.

STATISTICS obtained by sunshine recorders are interesting. Some curious facts have been recently published by the French Meteorological Bureau at Paris. Spain has 3000 hours of sunshine a year; Italy, 2700; France, 2600; Germany has 1700, while England has but 1400. The average fall of rain in the latter country is greater than in any other European country.

PHOTOGRAPHIC CLASSES AT THE BATTERSEA POLYTECHNIC.—The Committee announce the following photographic classes for photographers, engravers, &c.: A seven months' course of instruction in theoretical and practical photography, on Monday and Thursday evenings, at 7.30, commencing on Monday, September 25, by Mr. E. Senior (Honours Medallist). Particulars of times and fees are given in the prospectus, gratis on application. Detailed prospectus, with syllabus of work, &c., are obtainable for 1d.; post free, 2½d.

"It is a pity that amateur microscopists do not more fully recognise the necessity of recording, to some uniform and convenient scale," says Mr. J. H. Cooke in *Knowledge*, "the dimensions of the microscopic objects that they make their study. This want of uniformity not only detracts from the value of the work done, but it also renders the work of comparison of the drawings of the objects laborious and unreliable. By operating on some objects of known size it is easy to ascertain what arrangement of the microscope, and of its objectives and ocular, is necessary to obtain an image with the camera lucida of any required size. Having determined on a given amplification, it should be adhered to, and a scale be made corresponding to this amplification. The actual dimensions of the object might then be readily ascertained by applying this scale to the various parts of the image or drawing. The value of some such uniform method as this is self-evident."

THE Ludlow Photographic Society's Third Annual Exhibition of Photographic Work will be held in the Assembly Rooms, Ludlow, on Wednesday, October 11. The following is the schedule of classes:—Members' Classes: Class 1.—Set of Three Direct Prints, any size, any process: 1. Landscape or Seascape; 2. Architecture; 3. Figure or Animal Study. Class 2.—Hand Camera. Set of Three Direct Prints, any size, any process, any subject. Class 3.—Lantern Slides. Set of Six. Class 2.—Enlargements. Two Prints of different subjects, enlarged not less than two diameters, any subjects, any process. Direct prints from negatives must be sent with enlargements. Open Classes (for Amateurs): Class 5.—As Class 1 exactly, except that the prints may be direct or enlargements. Class 6.—Hand Camera. Set of Six, any size, any subject. Class 7.—Lantern Slides. Set of Six. Awards in each Class: 1st, silver medal; 2nd, bronze medal. All entries and other communications are to be addressed to the Secretary, Ludlow Photographic Society, 14, Mill-street, Ludlow.

PHRENOLOGY BY PORTRAIT.—A portrait of Dreyfus in a phrenologist's window attracted a great deal of attention early this week. The estimate of his character, based presumably upon a study of the portrait only, is as follows: "A glance will show what a striking correspondence there is between the formation of his (Dreyfus's) head and what is definitely known of his character. Guilty or innocent, his most pronounced characteristics are self-esteem, firmness, approbateness, and the domestic sentiments. It is these that have given him the extraordinary strength of mind that has characterised him during the last five years. Pride and persistence have never left him. With plenty of destructiveness and combativeness, such as gave him a love for things military, he has no small amount of cautiousness and secretiveness. He is a shrewd man, given to thinking much before acting, and well able to keep his own counsel. Strong in love and hate, he is a very human sort of man; not one to make more friends than enemies, but one whose friends will find it hard to disbelieve in him."

THE Committee of the Mid-Cheshire Society of Art, Northwich, announce that the Society's suite of rooms over the Union Bank, Castle Northwich, is now ready. This suite consists of three rooms, two of which will be used for the hanging of oil paintings, water colours, photographs, &c., and for the display of work of art of every description, all being the work of members of the Society. One of the rooms will be provided with literature in connexion with art, including the leading photographic journals. The dark room is fitted up with sink, developing dishes, ruby lamps worked with gas, and an enlarging lantern has been kindly placed at the disposal of the members by one of the Committee. A supply of hypo, both in crystal and solution, is provided, and the Committee hope to be able to always supply this free. The Committee invite members to send in some of their work for the decoration of the rooms, such work can be removed at any time by simply informing the Secretary. The Committee point out the great advantages that are derived from the affiliation of the Society with the Royal Photographic Society of Great Britain, by which lantern slides and materials for about thirty lectures are placed at the disposal of the Society, and a large collection of photographic work of the highest class can be brought down for exhibition at any time. By this affiliation members touring can use the rooms of other affiliated societies in the different towns, we extending the same courtesy in return. Should members wish to photograph places that are not open to the general public for that purpose, the Secretary will do all in his power to obtain the necessary permission. As the Mid-Cheshire Society of Art is now recognised in all photographic circles, both at home and abroad, all notices of competitive exhibitions are sent to the Secretary and are posted up in the rooms. This will enable members to compete for prizes throughout the photographic world. As a case in point, the Secretary has just received from America full particulars of the Philadelphia Salon, to be held in October this year, and to which members are invited to send in work. During the winter months lectures will be given in connexion with various branches of art.



**THE PARIS EXPOSITION.**—The Paris correspondent of the *Daily Telegraph* observes that some prophets of evil having arisen who predict the boycotting of the Universal Exhibition of 1900 by foreign partisans of Captain Dreyfus, and who have even used the phrase, "a commercial Sedan," in connexion with next year's big fair, a writer comes forward in order to show that the Germans, at least, are fully determined to participate to a large extent in the approaching international show. The author of the article has had his facts from the German Commissary of the Exhibition, Herr Richter, who first proclaims to the world that he is in thorough harmony with his French colleagues. Germany, we are told, will be represented in all the groups of the Exhibition except in those of education and colonization. The two departments mentioned have been dispensed with in order to leave more room for artistic and commercial groups. The Art Department will be important, and the two schools will be represented. Herr Anton von Werner is organizing the display for the General Society of German Artists, and the locale of the pictures is to be decorated and arranged by Professor Seidl, of Munich, with the help of Professor von Lembach. Next, perhaps, in interest not commercial will come the German Group No. 18, which has been organized at the wish of the Kaiser, who conferred with the French Ambassador in Berlin, the Marquis de Noailles, on the matter. This is to comprise an historical exhibition of Prussian and German military uniforms from the days of Frederick William, the Grand Elector of Brandenburg, to our own. The scientific, manufacturing, and machinery groups will be very strong, including optical and surgical instruments, chemical laboratories, rare gold and silver work from Hanau and other places, porcelain from the State manufactories, furniture from Berlin and Cologne, toys from Nuremberg and Sonneberg, knick-knacks or brimborions of all sorts made in Germany, silks from Crefeld, lace from Plauen, dynamo machines, cranes, colossal engines, and railway carriages.

ABOUT midnight on Saturdayweek a distressing fatality occurred at Beaumaris, resulting in the loss of the lives of two young men. During the past month, among the numerous yachting parties which at this season of the year make Beaumaris their rendezvous was one consisting of Mr. Norman C. Lange, aged twenty-five, son of Mr. Paul Lange, the well-known amateur photographer, 33, Shrewsbury-road, Oxton; Mr. Thomas W. Frame, aged twenty-four, 25, Mather-road, Birkenhead; and Mr. Ernest Brown, 9, Clementina-terrace, Carlisle, and 65, Fenchurch-street, London. All three apparently were quite well acquainted with the handling of their little craft, a five-rater cruiser, named the *Vixen*, designed by Mr. Lange himself, who is a member of the Royal Liver Yacht Club, and had sailed her during the month all over the Beaumaris and adjoining waters with perfect safety. They had the assistance of two hands. Last Saturday night the three young gentlemen, who had spent the evening on shore, walked together down to the beach about 11.30, and entered the punt which was anchored there, and proceeded to the *Vixen*, which was moored about a quarter of a mile away. When about half the distance to the yacht had been traversed, one of the young men turned round suddenly, and leaned over the side of the punt, and in an instant the water poured into the frail craft, which capsized, throwing its occupants into the water. Not one of the three appears to have lost his presence of mind, nor, in fact, to have been much alarmed at the accident, and one of the two who were drowned, in fact, called out, "Are you all right, Browne?" Browne replied, "I am all right; look out for yourselves." Whereupon Lange and Frame struck out for the shore, and Brown heard no more of them except some splashing. Seeing that, as he thought, his friends were all right, Browne turned his attention to his own safety, and got hold of the capsized punt, which was floating, keel upwards, close by. Several times he managed to get on the keel, but as often as he did so the punt slipped from under him, so finally he got hold of it, and, pushing it before him, at last managed to reach the shore safe and sound. Then he looked out for his friends, who he supposed had reached the shore before him, but he could see nothing of them. He shouted "Frame" and "Lange" several times, but got no answer. The bodies of the two young men were subsequently recovered. One of Lange's boots and his cap were missing. These were later washed ashore, when it was found that the boot was half unlaced, indicating that a desperate attempt had been made by the poor fellow to lighten himself by getting rid of his boots, in which, however, he was only partially successful.

## Patent News.

THE following applications for Patents were made between August 28 and September 2, 1899:—

**PHOTOGRAPHS ON SILK.**—No. 17,375. "Improvements in and relating to the Production of Photographs on Silk." F. J. FARRELL and E. BENTZ.

**KINEMATOGRAPHS.**—No. 17,405. "Improvements in Kinematographs." L. E. GRANTHASTEDTEN.

**DARK SLIDES.**—No. 17,415. "Improvements in the Construction of Photographic Dark Backs and the like." Complete specification. C. P. GORRE.

**FILMS.**—No. 17,446. "Improvements in Photographic Films." J. E. THORNTON and C. F. S. ROTHWELL.

**PROJECTION APPARATUS.**—No. 17,514. "Improvements in and connected with Optical Projection Apparatus." J. SZCZEPANIK.

**SWING BACKS.**—No. 17,521. "Improvements in Swing Back for Photographic Cameras." Complete specification. W. F. CARLTON and H. W. LOCKE.

**GAS FOR PHOTOGRAPHY.**—No. 17,522. "Improvements in Apparatus for Photography by Means of Gas." Complete specification. A. G. ADAMSON.

**PORTABLE DARK ROOM.**—No. 17,589. "A Portable Photographic Operating Chamber." Complete specification. F. SCHAETZKE.

**FILM-HOLDERS, &c.**—No. 17,737. "Improvements in Photographic Film-rolls and Roll-holders." J. E. THORNTON.

**SENSITISED PAPER CARDS.**—No. 17,738. "Improvements in Sensitised Papers, Cards, and Other Materials used for the Production of Photographic Prints from Negatives." J. E. THORNTON and C. F. S. ROTHWELL.

**SENSITISED PAPERS.**—No. 17,739. "Improvements in Photographic Sensitised Papers and the like." J. E. THORNTON and C. F. S. ROTHWELL.

**MOUNTS.** No. 17,741. "Improvements in Photographic Pictures and in the Materials or Mounts Therefor." J. E. THORNTON and C. F. S. ROTHWELL.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
18.....	South London .....	Demonstration: Photographic Printing by Carbon Process. Mr. Skelton.
19.....	Gospel Oak .....	Exhibition and Criticism of Members' Lantern Slides
19.....	Hackney .....	Concerning Exhibitions and Competitions. W. D. Welford.
20.....	Photographic Club .....	Discussion: Uncorrected Lens Work.
20.....	West Surrey .....	Open Night.
21.....	London and Provincial .....	The Kromax System of Colour Photography. T. Knight Barnard.
23.....	South London .....	Excursion: Ewell. Leader, H. Esler.

**Hackney Photographic Society.**—September 5, the President (Mr. W. F. Fenton-Jones) in the chair.—The EXCURSION SECRETARY announced that in the July excursion competition the marks had been divided by Messrs. Hunt and Selfe. The Hon. Secretary demonstrated the working of Vicol paper. It is a print-out paper, which has to be treated the same as other kinds of P.O.P. up to the making of the finished print. The feature of the process is that colours may be produced in the prints by the local application of different solutions. The solutions are: A. Citric acid; B. caustic soda; C. pyro. The application of these produce respectively pink, blue, and yellow, while a mixture produces other shades. The demonstration was quite successful. The President then showed the biokam, a small instrument for taking "living pictures." It is very ingeniously constructed, and combines in itself an instrument for taking, printing, and projecting the pictures. Among other features it has two Voigtlander lenses, and is sold complete at six guineas. About half a dozen subjects were shown on the screen to illustrate the capabilities of the instrument.

**North Middlesex Photographic Society.**—September 11, Mr. S. H. Fry in the chair.—Mr. J. W. MARCHANT read Mr. H. T. Malby's Affiliation lecture on

#### THE PHOTOGRAPHY OF FLOWERS.

The lecture was very practical, and was illustrated by some good slides. On its conclusion, one of the members said that no guide was given by the lecturer as to the exposure required, and asked for information on that point, whereupon several members gave their experiences in this direction, and, as they differed very considerably, it is to be hoped he was not more mystified than before. Mr. H. W. BENNETT made a few remarks upon the paper. Talking of colour screens for this work, he said he had found that some flowers, although to the eye they seemed the same colour as another kind, required a screen to get the proper effect, while the latter did not. A very useful tip for this work was to use, instead of a tripod, a piece of wood wide enough and strong enough to bear the weight of the camera, about four or five feet long. The camera was fastened upon one end, while the other was screwed down by a single screw to the table upon which the flowers were placed. The advantage of this arrangement lay in the fact that you could get the best position from which to take them by simply swinging the board from side to side as required. The board should be grooved, so as to enable the camera to be moved to and fro. Another point was that better colour rendering was obtained by a long exposure than by a short one.

**Rotherham Photographic Society.**—The autumn and winter session was commenced on Tuesday night, September 5, when there was a good attendance to witness the Hon. Secretary (Mr. Hemmingway) give a demonstration of the working of the platinotype process, cold bath. The chemical and historical side of the subject received some attention. The Platinotype Company kindly sent a number of beautiful specimens. Special prizes, offered by Messrs. Marion & Co. and Paget Prize Plate Company, for photographs taken in connexion with the Decorated Horse and Carriage Parade on Bank Holiday, have all been secured by members.

### FORTHCOMING EXHIBITIONS.

1899.	
Sept. 22–Nov. 4 .....	Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.
„ 25–Nov. 11.....	Royal Photographic Society. Hon. Secretary, Major-General Waterhouse, 66, Russell-square, W.C.
October 18–24 .....	Croydon Camera Club. Hon. Secretary, W. H. Rogers, 106, Holmesdale-road, South Norwood.



- October 22-Nov. 19... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.  
 Nov. 27-Dec. 18 ..... American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.  
 December 7-9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.  
 „ 27-30 ..... Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### THE R.P.S. EXHIBITION.

To the EDITORS.

GENTLEMEN,—Enclosed is copy of a letter I am just sending to the General Committee of the Royal Photographic Society, and I shall be glad if you consider it of sufficient interest to insert in your JOURNAL.—I am, yours, &c.,  
 LYDELL SAWYER.  
 230, Regent-street, W., September 10, 1899.

[COPY.]

“September 9, 1899.

“To the General Committee, Royal Photographic Society.

“GENTLEMEN,—I sent by hand a contribution of pictures to your forthcoming Exhibition at the earliest moment on the morning of September 7, after being prevented by an accident from delivering by nine o'clock on the night of the 6th, as I endeavoured to do. I was excessively surprised to find it rejected by both the Secretary, and later by the Selecting Committee, owing to late arrival! I respect legitimate rules, but I must state that this regulation is one of aggressive, tyrannical injustice, and paltry and spiteful as to its slight necessity, and immoral as to the extensive injury of its effects.

“It is a matter which might be fairly met by a little limited discretionary power being relegated to the acting Secretary, but it suggests, rather, a reactionary revenge for some former trouble through previous excessive laxity of your own laws. I may be expressing myself strongly, but I have also strongly before me the Peckaniffian smugness of a petty regulation which says to the would-be exhibitor, ‘You may have worked hard; you may be right in stating that your very anxiety to produce creditable work has delayed you, or an accident has checked your progress, but that is your affair. We quite ignore your imputation that we are called upon either to encourage exhibitors or to consider the quality of the work we may reject from our Exhibition. We are not concerned with the fact that some exhibitions are able to open within a few days from receiving their complete contributions; it suffices that we prefer seventeen full days. We are only concerned so far as we find by our official watch, Sir, that you are four minutes late, therefore do we have much just satisfaction in making you an example for attempting to trench on our Medes and Persian-like laws.’

“Personally, such an action, at the present moment, is of little importance to me, but, in earlier times, I have worked earnestly for months for the purpose of contributing to your Exhibition, and then such scant courtesy would have been a seriously cruel blow.

“I learned, on the early morning of September 7, also, that other exhibits as well as mine had already then been thrown out. The Secretary had no alternative; but are you, as a ‘parent’ Society, content that you are doing your duty in thus probably quenching the enthusiasm of anxious aspirants for so little fault or cause?—Yours faithfully,  
 (Signed) LYDELL SAWYER.”

[Other letters complaining that photographs intended for exhibition were denied acceptance by reason of late delivery have also reached us. We are sure that Major-General Waterhouse and the other responsible officers of the Society sincerely regret having to refuse photographs which are not delivered by the time specified in the regulations (which have been in circulation for nearly two months), but we believe we are correct in saying that those regulations do not invest the officers with any discretionary power in the matter of receiving late exhibits. Some such power as this might be delegated to them in future, but it is safe to say that, whatever concessions are made in the matter, there would still be late comers. We are sorry Mr. Sawyer's exhibits were excluded; but, from our knowledge of the internal management of the Society, we are in a position to assure him that the motives he ascribes for their rejection are entirely non-existent.—EDS.]

### THE STEINHEIL LENSES.

To the EDITORS.

GENTLEMEN,—The abstract of Dr. Rudolph Steinheil's article in Eder's *Jahrbuch* for 1897, which Mr. P. E. B. Jourdain has communicated to you, contains information of considerable importance to photographic opticians; but, as there are several mistakes of detail which may render it unintelligible to many of your readers, I take the liberty to offer the following corrections. An important fact connected with the improvements which Messrs. C. A. Steinheil Söhne have effected in their photographic lenses is the return to the symmetrical form of construction. The various stages of evolution are indicated by the periscope, the aplanat, the antiplanat (not antiplanat), and the orthostigmat. The older kinds of glass imposed limitations which drove Adolf Steinheil to the antiplanatic construction, but, as soon as the new glasses were discovered, he returned to the aplanatic type, and set his son, Dr. Rudolph Steinheil, the problem of calculating the orthostigmat. In Mr. Jourdain's communication this is unfortunately described as an “antiplanat” (THE BRITISH JOURNAL OF PHOTOGRAPHY, page 551, line 6), whereas it is in reality an aplanat anastigmatically corrected. With reference to the refusal of the German patent for orthostigmat, Type I., the remark in paragraph 5, page 551, should read, “The next thing to be done under these unfortunate circumstances was to come to an understanding with the more lucky applicant, Goerz.” It was never contemplated to “unite” the firms of Goerz and Steinheil, only to secure a licence for the manufacture of the lens, Type I., upon equitable terms. With regard to the latter part of paragraph 7, page 551, I may add that Messrs. Steinheil have withdrawn their application for the German patent for orthostigmat, Type I., as Type II., for which the patent has been granted, is a better lens. The aperture of this is f.6.8, not f.6.8, as stated in paragraph 8, page 551.

Concerning the wide-angle aplanat, Mr. Jourdain's communication states in paragraph 2, page 550, that the astigmatism was corrected “at the expense of sharpness and flatness of object.” This should read: “At the expense of intensity and flatness of image.” In the same paragraph the remark concerning the periscope should read: “The first result of his labours in this direction was the periscope, a double objective consisting of one sort of glass only. For this reason it was marred by the non-coincidence of the visual and the chemical foci, but in all other respects it fulfilled the conditions of a photographic objective.” Concerning the group-antiplanat, the statement that “it could not be made to act satisfactorily on account of the sorts of glass which were then obtainable” is rather misleading. The old kinds of glass did not permit of more satisfactory results being attained with this type of construction, but in some respects it was an improvement upon the aplanat, and, until the discovery of the new glasses, it enjoyed a considerable reputation, and is, in fact, still recommended by Messrs. Steinheil for use with their tele-photo attachment.

It may also interest your readers to know that Messrs. Steinheil, whilst calculating the orthostigmat, also improved the antiplanat, by introducing another element in the back combination. This lens is known as the rapid antiplanat, and ranks next to the orthostigmat. They have also improved their wide-angle copying lenses of the aplanat type by adding another element to each half. These facts are worth noting as stages in the evolution of the anastigmat or orthostigmat.—I am, yours, &c.,  
 P. EVERITT.

September 6, 1899.

### CLOUDS.

To the EDITORS.

GENTLEMEN,—I think it will be generally admitted that, to give the true and natural effect of clouds in a landscape, the clouds should be those that appear in the sky at the moment the photograph is taken. To introduce clouds into a landscape taken on a cloudless day, or to print in clouds other than those that are present when the photograph is taken, cannot be a truthful representation of the subject. The aspect of a landscape changes as the clouds change, and as the direction of the light changes with our relative position to the sun at different hours of the day. For example, a landscape taken at noon and the clouds taken on the morning of the same day—or at any time of the day except the time at which the landscape is taken—will produce the most incongruous effect, to say nothing of the effect which is produced by the indiscriminate introduction of clouds taken at all periods of the year, and at all hours of the day, without the least regard to chiaroscuro, direction of the light, or character of the subject. Why this objectionable method should be so largely resorted to I do not understand, as there is really no difficulty in taking cloud and landscape together in one exposure. In most of the landscapes I have taken—in all of recent years—clouds have been secured with one exposure. Where there are no clouds, I never attempt to print them in, I soften the effect by sunning down the sky, which, as Mr. W. J. Croall truly observes, “adds not only to the pictorial quality of the picture, but lends value, if not grandeur, to the subject.” I have an arrangement which I have used for some years past for taking clouds and landscape with one exposure, a sketch and description of which I hope to send you shortly, also a print showing a solitary white cloud in the sky—not taken on a rapid plate with an instantaneous shutter, but on a comparatively slow plate with an ordinary plate shutter to which the arrangement referred to is attached.—I am, yours, &c.,  
 COLONEL.



## STUDIO BUILDING: TO "CLARINETTE."

To the Editors.

GENTLEMEN,—If I had had the private address of above querist, I should have sent him my experiences in studio building.

I paid a sum of money for a house (24) which was then (jokingly) considered to be mine, and, being desirous of a photographic studio at bottom of garden, arranged with Messrs. Humphries, of Knightsbridge, to erect one of iron and glass for about 20*l*. This was done, and I commenced comfortably spoiling plates, when an individual walked in, said he was the district surveyor, and, while expressing extreme sorrow, intimated that erection must be taken down, and three feet from ground built with brick. You may be sure this was not done without protest, but it was eventually done, and again I began to enjoy myself, when, one day, two four-wheel cabs brought down eight or nine gentlemen, calling themselves a visiting committee from the ground landlords, the Haberdashers' Company. It seems that a gentleman living next door had lodged a formal protest against my studio, said it hindered his view (a coal yard). The roof was consequently lowered one foot, so that altogether the building, instead of costing 20*l*., ran me, or some one else, into the expense of 60*l*.

I should have been pleased if "Clarionette" had thought it worth his while to have called and seen what it came to at last.—I am, yours, &c.

WILLIAM JAMES BEARNE.

24, Drakefield-road, Nunhead, S.E., September 6, 1899.

## HOT-WEATHER PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—In the interesting letter, entitled "Hot-weather Photography," in your issue of the 8th inst., I hardly think your correspondent lays sufficient stress on the exceptional conditions under which this enthusiastic amateur worked.

A rainfall of five inches per hour is almost if not quite unknown in England. During the year 1898 the heaviest fall of rain was 6·7 inches in three hours, and the damage done by this storm here alone to roads, bridges, &c., cost over £750. The average yearly rainfall in England is roughly about thirty inches, and one-tenth of an inch per hour is considered a very good average fall.—I am, yours, &c., A. VICTOR HASLAM.

Breadsall Priory, Derby, September 9, 1899.

## Answers to Correspondents.

\*.\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\*.\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\*.\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

A. WEST; T. KING; W. G. ORME; T. S. M. W.—We are obliged to hold over replies to these and other correspondents until our next.

COLOUR.—You should succeed by the aid of Messrs. Cadett & Neall's spectrum plates and one of their light filters.

GEORGE HOLLAND (Mid-Cheshire Society of Art).—Better address our weekly contemporaries. We do not send out sets of lantern slides for the purpose named.

W. H. HUNT (Willesden Green).—Thanks for your letter and the enclosures, which we will keep by us. If the opportunity comes to us of bringing the matter to the notice of likely persons, we will avail ourselves of it.

POSITION OF BRIDE IN A PHOTOGRAPH.—WEDDING asks: "Please let me know which is the correct position for a bride to occupy in a wedding group. Should she be to the left or right of bridegroom?"—We are not sure that there is any set rule, but we think on the left.

ACETO-CELLULOSE.—ACETO says: "Having read the article on aceto-cellulose in THE BRITISH JOURNAL OF PHOTOGRAPHY, I wish to know if you can inform me where I can obtain it, or would you print formula of the same in your Correspondence column?"—So far as we are aware, aceto-cellulose is not an article of commerce. Better communicate with Messrs. Cross & Bevan, New Inn, W.C.

VARIOUS QUERIES.—P. H. ADAMS says: "I shall be glad if you will answer the following questions, giving the address of secretaries: 1. Is there a trade union for photographic or process operators? 2. Please give address of Secretary of the Photographic Copyright Union. 3. Which is the best all-round handbook on process work? You refer one of your readers to the ALMANAC, p. 639, which I have not got, for particulars of Copyright Union last week."—In reply: 1. No. 2. H. Gower, London Chamber of Commerce, Botoolph House, Eastcheap, E.C. 3. *The Half-tone Process*, by Julius Verfaesser, published by Percy Lund & Co., Bradford.

FORMULÆ WANTED.—INK says: "Will you please give two or three good formulae for sensitive collodion for wet plates?"—We scarcely understand this query. Collodion for wet plates is not sensitive. It is simply iodised, and is made sensitive by immersion in the silver bath. Formulae for both are given on pp. 1055-6 of the ALMANAC. Possibly, however, a collodion emulsion is meant. If so, formulae for that are also given on pp. 1057-8. These plates are usually used dry, but they may be exposed wet.

AVOIDANCE OF GRAIN IN COPYING.—G. BARKER says: "I should be obliged if you can tell me how to get rid of or avoid the grain of paper in copied photographs. I have copied several lately, and got good negatives, only the grain of the paper is too obtrusive."—In reply: The grain may be avoided by the proper lighting of the photograph to be copied. Employ well-diffused light, and, if possible, take the photograph vertically. Have the print as far as possible from the source of light, so that the surface irregularities do not cast shadows. It is all a question of lighting.

BOOKS WANTED.—A. P. S. says: "Can you tell me what are the best books for studying the following subjects, their prices, and publishers: (1) Photographic emulsions; (2) coating of photographic papers; (3) machinery used in coating and preparation of emulsions?"—In reply: (1) *Abney's Photography with Emulsions*, published by Sampson Low & Co., St. Dunstan's House, Fetter-lane, E.C.; (2 and 3) *Just's Bromide Papers*, published by Percy Lund & Co., Bradford, and Woodbury's *Gelatino-Chloride Printing*, published by Hazell, Watson, & Viney, 1, Creed-lane, E.C.; but there is not much practical information available in regard to 2 and 3.

STAINED PHOTOGRAPHS.—G. B. H. says: "Enclosed are two photographs which have been stained in some part of the process. A good deal of argument and a number of opinions have been given as to what cause and at what stage of the process it occurred. Eventually it has been decided to submit the decision to you. Will you, then, be kind enough, in your next issue of the JOURNAL, to give your opinion as to cause?"—It is quite impossible from simply looking at a couple of prints to say the immediate cause of the staining. All one can say is that it is due to faulty work, but not at which stage of it the stains are due. The prints rather look as if the water in which the free silver was washed out was contaminated with hypo.

SIMULTANEOUS DEVELOPMENT AND EXPOSURE OF BROMIDE ENLARGEMENTS.—GIT says: "To obviate the difficulty of determining the exact exposure for bromide enlargements, a correspondent of the *Wochenblatt* recommends that, before exposure, the surface of the sensitive paper be treated with a developer incorporated with glycerine. The growth of the image after or during exposure can be watched and arrested at proper depth. Subsequent development can be resorted to for modifying the character of the image. 1. How much glycerine should be added? 2. Will iron developer suit? 3. How long should the surface be treated? Any other hints will greatly oblige."—We know nothing more of the method than was published, and we have not tried it. Possibly some reader who has experimented with it will give his experience for the benefit of our correspondent.

INTENSIFICATION; AN EXCHANGE TRANSACTION.—VEXED says: "1. I have with bichloride of mercury intensified a valuable negative, and to reduce a part of it I wiped it with hypo, then washed. The parts wiped have now got a thick dull stain, which acid or hypo does not remove. 2. About four weeks ago in the JOURNAL I advertised an autocopyist for exchange. After mutual agreement by post, I accepted a half-plate camera and tripod. I valued autocopyist at 4*l*.; he valued his kit at 3*l*. 10*s*. to 4*l*. We both sent our things. I am dissatisfied, for his kit is very ancient and knocked about, and not worth 10*s*. I ask him to send me 1*l*. to satisfy me, or half of what he values it at, viz. 1*l*. 15*s*., and I will return the lot. His last letters are disagreeable, and he describes mine as all bounce. How can I get redress, or the return of autocopyist?"—1. Evidently the negative was not sufficiently washed after each operation. The only thing we can suggest is to bleach the negative again in the bichloride solution after well washing, and intensify afresh. 2. The only way is through the County Court, but you will have to prove misrepresentation. It was unwise to make the exchange before seeing the articles.

COLOUR PHOTOGRAPHY.—D. E. says: "I am preparing a paper for an address on the 'Reproduction of Colour by Photography.' Can you tell me where I can obtain particulars of the experiments of Seebeck, Herschel, Becquerel, Abney, and any others who may have experimented in photography in natural colours? I believe they all produced photographs in tints more or less true to nature, but could not fix them. Is this so? I am a member of a photographic society affiliated to the Royal, and therefore presume I could consult any books in the library of the Royal, and should be prepared to spend a couple of days in London to look up the particulars. I should like to show prints reproducing the results obtained by the early experimenters. There is a semi-prophetic paper by J. W. Swan in the *Year Book* for 1870. He says these early results were achieved by using a sensitising compound that went through various changes of colour dependent on the exposure, and that we should never get photography in natural colours till we got a substance that would turn green, say, because green light shone on it and independently of the exposure. This sounds right."—In reply: An article on the subject of colour photography, in our ALMANAC for 1889, will supply you with the groundwork of the subject. Undoubtedly, a reference should be made to the books in the Royal Photographic Society library, which contains most, if not all, the literature on the subject. You are correct in the main as to the inability of the experimenters named to fix their results. We doubt if any such specimens are available for the purpose. Thanks for the reference to Mr. Thorpe.



# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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## THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1900.

Edited by THOMAS BEDDING, F.R.P.S.

THE thirty-ninth annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1 next. Its preparation is already receiving attention. This year's ALMANAC reached a total of 1508 pages, and the entire edition of 20,500 copies was sold out within about three months of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past ALMANACS have been received is the surest proof that the lines upon which that publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1900. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the ALMANAC in directions which may occur to our readers as susceptible of improvement.

The ALMANAC for 1900 will appeal to photographers all the world over as a daily reference guide in practical work. The

formulae will be revised where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages of the 1900 ALMANAC. Those of our friends intending to co-operate with us in in this respect will oblige us by letting us have their MS., sketches, &c., at the earliest possible date.

Secretaries of societies will also oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us as early as possible.

The publishers ask us to remind advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

## EX CATHEDRÂ.

A MOST interesting “link with the past” was present at the Missouri State Convention of photographers last month. This was Mr. August Brassant, who informed his hearers that he was eighty years old on July 6 last. He was born in Paris, and was employed there as an apprentice in the shop of the man who was silversmith to the King of France. Mr. Daguerre came to his shop one day to ask if they could furnish him with smooth plates that were made simply by polishing by hand. “My employer told him no, it could not be done. He turned to me and said, ‘Well, young man, can you make a plate perfectly finished by hand? Can you do it?’ My employer stood behind him and motioned to me to say no. I was struck with a great astonishment. I reflected a moment, and said, ‘Yes, I can do it.’ Mr. Daguerre was so surprised that he patted me on the shoulder, and said, ‘Well, young man, go to work.’ I worked for two or three weeks without knowing what it was for. At that time the dry plate was unknown—in 1838



—and on that account it required two hours' exposure to take a picture. After that time I worked for some time on the plates; then I became a photographer, which business I followed until about four or five years ago."

\* \* \*

A FEW weeks ago we announced the formation, in the United States, of the General Aristo Company, which, with a capital of 5,000,000 dollars, combined the whole of the important sensitive printing-paper manufactories under one head. Remarks on the probable effects which this unprecedented combine might have on photographers and others have led to the publication of the following official explanation, which, it is hoped, may reassure the American public: "The General Aristo Company," we are told, "is not a trust in any sense of the word. It is a Company formed which purchases outright the paper business of the Eastman Kodak Company, the American Aristotype Company, the Nepera Chemical Company, the New Jersey Aristotype Company, the Photo Materials Company, and the Kirklands Lithium Company. It is an absolute consolidation under one company and one capitalisation. It is not a combination of interests of several individual concerns handled by promoters who do not understand the business and have no interest at stake except the profit of stock manipulation, but a Company which pays down good money for these various companies, and have as much at stake in the proper care of their consumers and in the reputation of their goods as any one of the individual concerns had previous to the consolidation. . . . There will be no increase of price, and the Company will not permit any competition to undersell them, quality considered. The General Aristo Company will control for North America the raw-paper products of the Rives and Steinbach mills of France and Germany. Aside from this, their power of purchasing other materials will be greatly enhanced, which will enable them to give better goods and better service for the money than any other photographic concern in either hemisphere."

\* \* \*

*Apropos* of trusts and combinations, we gave publicity a few months ago to some details of an attempt now being made in the States by a Mr. Kurtz, acting in conjunction with a Colourtype Company, to "set up a claim to all patent rights in three-colour block-making, and thus get the whip hand of those practising the process. Of course, Kurtz's patents were antedated many years ago, but the fact appears to have been overlooked by those most concerned, probably through ignorance. However, Mr. Weeks, of Philadelphia, published a letter, about a month ago, which should effectually put a stop to any further attempts at "frightening the photographic public in the States. Mr. Weeks says: "In 1881, twelve years before Kurtz's patent, my friend Mr. Ives, of Philadelphia, who was at that time the only practical half-tone worker in the United States, made three-colour plates, using single-line screens, with parallel lines running in one direction only, and the lines in one plate running in a different direction from the lines in the other plates. At the present time Mr. Ives has, framed in his office in Philadelphia, proofs which were made in this manner in the year stated, that is, 1881. These same proofs were exhibited by him in the Newtelties Exposition in 1884, [nine years] previous to the date of the Kurtz patent. Mr. Ringler, of the Colourtype Company, recently visited Mr. Ives, and had this [matter entirely

explained to him, and also had the prints referred to, which bear the date of their execution, shown him. In view of these facts I see no cause for any worryment on the part of any one wishing to operate the three-colour process, whether by single or double-line screens, as Mr. Ives can effectually dispose of the Kurtz patent. We are not working the three-colour process at the present time, although, having made all arrangements to do so, we will very soon have that department in operation, and hereby extend a cordial invitation to Mr. Ringler or Mr. Kurtz to visit our establishment. For the benefit of the craft I would be glad to have you give this matter publicity, and would say that we can produce plenty of good witnesses who can testify as to the time that Mr. Ives did the work specified, and it will afford us considerable pleasure to do so." This peculiar form of patent-farming which Mr. Weeks so clearly discounts, is not known here, it is true, but, as our readers are aware, the reinvention and exploitation of old colour processes is no uncommon thing among us.

\* \* \*

MR. RICHARD KEARTON recently visited Scotland in order to complete the information for his new book. He entitles it *Our Rarer British Breeding Birds*, and that describes its subject. Mr. Kearton and his brother, Mr. C. Kearton, co-operate on a book, the latter being the picture-getter. He has planted his camera in almost inaccessible places.

\* \* \*

At the recent American Convention the Nepera Chemical Company, the introducers of Velox, exhibited a machine by means of which a large number of Velox prints can be made in a few hours. The machine consists of a small box about two feet long by a foot wide and a foot deep, and contains a roll of sensitised paper from 200 to 300 feet long. The negative is placed in the lid of the box and the sensitised paper passes along beneath it. Once a correct exposure is obtained only two motions are necessary for each picture. A lever is drawn up, which exposes the paper beneath the negative and also registers itself on a small cyclometer; another handle is turned, which causes to pass beneath the negative the strip of sensitised paper. With these two simple movements it is possible for the operator to turn out 5000 or 6000 prints in a single day. As the exposure is in every case exactly the same, it is natural that one print is exactly like the other. The Company exhibited the machine at work, and it attracted a great deal of attention. For printing on Velox paper the machine should be in great request.

\* \* \*

COMMENTING on some simple directions recently given in the *English Mechanic* for viewing binocular prints without the aid of a stereoscope, a correspondent of that journal says that squinting inwardly does not produce the true stereoscopic effect, because the vision crosses, so that we see with the left eye the picture that we ought to see with the right, and *vice versa*, the result being a sort of reversal of the perspective—curious with geometrical figures, but false and quite unnatural with ordinary views. To get the true stereoscopic effect it is necessary to squint *outwards*, just enough to bring the two pictures into one. "This is by no means such an easy feat as the other, and I cannot do it myself, but I have seen it done by an accomplished photographer, who habitually tests his stereoscopic work in this way. To make sure that you are squinting outwards it is necessary, at the outset, to place a



partition between the eyes, reaching from the nose nearly to the line between the two pictures. Possibly many have the power of squinting outwards at will, but it does not strike me as a very wholesome exercise to squint either way—for young people at all events."

\* \* \*

THE writer of this letter is in error on several points. For viewing binocular pictures without a stereoscope it is not necessary to squint inwardly, *i.e.*, cross the axes, or outwardly, that is, to diverge them; it is not required to interpose a septum between the two pictures, and there is no question of "squinting" at all in the matter. As we understand the way in which the eyes may be accommodated to acquire facility in seeing binocular pictures stereoscopically, neither convergence nor divergence of the optic axes is required. On the contrary, we take it that the optic axes must be virtually parallel at the normal distance of distinct vision, that is, from eight to ten inches. Ordinarily, in viewing objects at that distance, the axes are converged, and, when for a real object we substitute a stereoscopic photograph, it is obvious that it is not axial convergence which is required, but some such control over the ciliary muscles as will enable the left eye to see the left-hand picture, and the right eye the right-hand picture. If this simple principle were generally grasped, the nonsense that is written about injuring the eyes by this method of obtaining muscular control over them would be considerably diminished.

\* \* \*

THE newspapers last week contained accounts of two methods of increasing the power of acetylene for illuminating purposes. One process is that of an engineer of St. Petersburg named Celowsky. He impregnates the calcium carbide while hot with a mixture of 1 part (by weight) of tar and 40 parts of petroleum residue. The hot carbide coming from the furnace absorbs the mixture throughout its bulk. The "Elyte" thus made is not affected by air, and in water it disengages acetylene very slowly and regularly. When it is taken out of the water and no longer drips, it ceases to yield the gas. The production of acetylene is increased by it some ten or twelve per cent., and it is otherwise more convenient than simple carbide. The other new illuminant was demonstrated at Hunmanby, a village just outside Filey, last week, at the initiative of the Scarborough District Lighting Company, Limited. Hunmanby is the first place in England lighted with the new illuminant. It has been installed in the church, and at Hunmanby Hall (the residence of Lord William Cecil), and in a number of shops. Mr. T. G. Marsh, who introduced the penny-in-the-slot system, is arranging for a supply of the new gas to smaller consumers on the prepayment principle. It is said that Electroid gas is composed of acetylene, oxygen, and a "third substance." It gives a light of great purity and brilliancy. The Scarborough District Company intend lighting many villages and mansions throughout Yorkshire with it.

\* \* \*

WE are asked to announce that the Annual General Meeting of the members of the Photographic Copyright Union will be held on Tuesday evening, September 26, at the Café Royal, Regent-street, W., at eight p.m. Those intending to be present should note the fact that a change in the meeting-place has been made this year, from the St. James's Restaurant to the Café Royal.

THE London County Council, in their annual report, ask for further authority in the matter of cinematograph entertainments, which are now frequently given in places over which they have no control, and which, by reason of the danger attending them, it is claimed should be under rigid inspection. It is obvious that school buildings, places of worship, and similar edifices, are aimed at in this request, which, it appears to us, is a perfectly reasonable one on the part of the Council.

#### SEPARATION OF THE LENSES IN STEREOSCOPIC WORK.

A CORRESPONDENT asks us to devote an article to the subject of the adjustment of lenses in stereoscopic work. The reason he gives for his request may be thus stated. In ordering a stereoscopic camera to be made with the lenses so attached to the front that their distance of separation could be varied, he was met by the following pronouncement from the firm of camera-makers with whom he was in communication: "We note what you say with regard to the adjustment of lenses for different distances, but we are still of opinion that it is more of a theory than of practical value, and this view of the case is also shared by Messrs. —, to whom we have referred the matter."

We are aware that many firms who, in America and this country, as well as on the Continent, make hand and stand stereoscopic cameras for general use, do not trouble to give an adjustable movement to the lenses, for the obvious reason, of course, that amongst stereoscopic photographers there is very little call for the useful power which this convenience would place in their hands. Nevertheless, amongst the comparatively few persons who have a thorough grasp of the underlying principles of stereography and the important bearing they have as regards correctness of application to practical ends, the utility of adjustable objectives in binocular work is so great that we may profitably take occasion to point out a few of the many reasons why that power is practically as well as theoretically of value.

In binocular vision our appreciation of relief, height, and distance is governed entirely by the power of axial convergence which our eyes possess. If we look at an object which is situated, let us say, at a distance of half a mile, the optic axes are virtually parallel; at any rate, the parallactic angle is so small that no sensation of relief results. In other words, as regards an object situated at the distance named, the two eyes, instead of seeing dissimilar views of it, as in the case of objects situated only a few feet or yards from the observer, virtually perceive them as identical. There is no "seeing round" either the one side or the other of the two similar views which are transmitted to the retina.

What applies to the eyes in the case of this narrowness of parallactic angle applies also to the lenses on the camera front. No relief is seen in distant parts of the binocular photograph; but the comparison does not hold good when we come to objects situated within a few feet or yards of the camera. The eyes, by their powers of accommodation and axial convergence, see those objects in natural relief; but, inasmuch as the lenses situated at a distance, we will suppose, of three inches from centre to centre on the camera front, possess neither the power of accommodation nor that of axial convergence, they impart to those objects, when they are viewed in the prints, an aspect of excessive or rather exaggerated relief. They see too much round the subject. Let the portrait of a person be taken with



three-inch separated lenses, four or five feet from the camera, and the effect described will be at once apparent in the stereo-photograph.

It can be seen, therefore, that the need of adjustability in lenses for binocular work is a real, and not an imaginary, one. Suppose one is photographing a vase of flowers, situated a few feet from the camera. In practice, a separation of two inches is sufficient to give natural as opposed to strained relief, which would make the object have a cut-out or model-like appearance. In portraiture a separation of two and a half inches suffices. For interiors and landscape work, three inches should separate the centres, and where, as in the latter class of photography, the nearest prominent object may be hundreds of feet or yards away, a separation of three and a half or even four inches may be adopted.

It all comes to this: the nearer the object to the camera, the less the separation; the more remote the object, the greater the separation. We have known of stereoscopic photographs of objects placed immediately in front of the camera being taken with a separation of only one and a half inches between the lenses. On the other hand, instances may be recalled where, when stereo-photographing distant objects, yards have separated the objectives, and there is the well-known case of the binocular photograph of the moon, taken, so to speak, with the lenses separated many thousands of miles. Here we have the two extremes of the principle brought into force.

It is in the photography of objects placed near to the camera that the value of being able to adjust the centres of the lenses chiefly asserts itself. Half an inch in the separation makes all the difference between naturalness or exaggeration of relief. It is the latter defect which offends so many of those who examine stereo-photographs for the first time. In nature, no matter how near an object may be to the eye, we are not conscious of its possessing exaggerated relief. The baseline of the parallax angle formed by the eyes is approximately two and a half inches. When, however, a stereograph of the same object, taken under conditions which lengthen the baseline to three or even three and a half inches, is presented to the eyes it is not difficult to conceive that the mental impression so produced differs vastly from that which is the result of an examination of the original by ordinary vision. In the latter case we have the sense of reality; in the former, the impression of unreality.

We might extend this theme indefinitely. Sufficient, however, has probably been said to show that, when it is desired to take the fullest advantages of the power of making stereographs of objects situated very near the camera as well as those lying in more distant planes, adjustable objectives become something more than a convenience—viz., a necessity.

**Solid Hydrogen.**—One of the interesting features of the Chemical Section at the meeting of the British Association was an account, by Professor Dewar, of his success in the solidification of hydrogen. He explained that, when solidified, it presented the appearance of a clear, colourless solid, resembling ice, and sometimes like frosty snow, and not at all like mercury, as had been anticipated. In the course of the discussion which followed it was announced that Professor Dewar had also succeeded in liquefying helium, one of the newly discovered atmospheric gases. Now the liquefaction and solidification of all the gases is brought about under enormous pressure and an intense degree of cold, and it is surprising that no

serious accidents during the experiments have happened through the bursting of the apparatus from the immense pressure within. It speaks well for the excellence of its construction as well as for its design.

**The Irrepressible Cinematograph.**—No event of interest, however little, seems to take place now without its being cinematographed. It does not matter whether it be a jubilee procession, the launch of a vessel, a photographic convention, a prize fight, a bull fight, or anything else, it is cinematographed. We read that, at the embarkation of the troops for South Africa at Southampton on Saturday last, as they crossed the gangways they were cinematographed. There is little doubt that, if war does unfortunately come about in South Africa, enterprising cinematographers and photographers will not be far off. It is related of one of the old "peep-shows" that were common at street corners some forty or fifty years ago that the showman used to tell the small boys, when showing the Battle of Waterloo, "There, at the back, is the Duke of Wellington and Buonaparte fighting a duel, but you can't see them because of the smoke." Smoke, now that smokeless powder is so much used, will not so much interfere with photography on the battlefield as it has done in previous wars when photography was attempted.

REFERRING to photography on the battlefield, it may be mentioned that the late Mr. Roger Fenton was the first photographer who essayed photography at a seat of war. In the Crimea, Mr. Fenton, with a 15 × 12, if not larger—we think it was 18 × 15—camera, secured some excellent pictures. Mr. Fenton worked, if we mistake not, both the wax-paper and the wet-collodion processes, and the results were published. It would be interesting to know where these negatives are now, as they possess great historical interest, particularly as showing what was accomplished in those early days under most adverse conditions.

**The British Association.**—The British Association's meeting at Dover has not been prolific in matters relating directly to photography, though it has figured indirectly in several ways. For many years past at these meetings little notice has been taken of the subject of photography as photography, although it has made many strides during the past few years, and many new facts discovered, which, though they may not have immediate practical value, are still important from a scientific point of view, yet they have not figured at all at these meetings. If we refer back to the meetings of twenty or thirty years ago, we shall see that the case was different then, for it was rare that one or more papers were not read on subjects directly connected with the art-science. In fact, the late Mr. Claudet seems to have contributed a paper to the Association almost annually. Why should photography, in its scientific aspects, be so much neglected by the British Association for the Advancement of Science now? Probably the answer is that there is no one at present sufficiently enthusiastic in the subject to bring it before the Association.

#### JOTTINGS.

THIS page of Jottings, by way of contrast to some of its immediate predecessors (which were Scotch), will have a decidedly American twang. Some weeks ago I remarked upon the fact that the British market was being supplied with enormous numbers of American-made cameras, and I gently chided our home manufacturers for allowing such things to be, forgetful for the moment, as my friend "Free Lance" has since reminded me, that there are several hand cameras of native construction which compete point by point with the American productions. To this matter I shall refer subsequently. Meanwhile I note that my remarks on the main subject have attracted the notice of a little journalistic eagle on the other side of the Atlantic, and that this brave bird is speaking out his wings and chortling in his joy (if I may be allowed to fit in here what sounds like a suitable phrase from "Jabberwocky") in a most triumphant fashion.



Thus: "Penrose & Co., in London, England, had to come to this country for a proper press to proof their half-tones. America got the contract for a big bridge in India, and had the thing up and off before the other bidders got out of bed. Velox is holding its head up proudly in England, France, and Germany; Kodaks ditto; Carbutt and Seed plates and films, Monroe cameras, and much else of American make is winning great favour abroad, which seems to rather wake up 'Cosmos' in THE BRITISH JOURNAL OF PHOTOGRAPHY this month. Here is some of what he says." And then my friend of the *Photo-American*, from whose pages I am quoting, goes on to mention what I said about the matter in these columns on July 28 last.

"No need," proceeds my critic, "to blush about having the good taste and common sense to prefer a camera like the Premo, for instance, instead of those beautifully made but clumsy old lumber yards the English makers turn out. I've seen lots of them and admired the exquisite handiwork; but, as for carrying one around, that's another thing; I beg to be excused. Three of their solid mahogany plate-holders, with slides as thick as packing-box stuff, make load enough, let alone carrying a camera, too. When it comes to English cameras, Americans are content to use their own make, and send Cousin John all he wants, too; for 'it is more blessed to give than receive' in this case."

To be just to this writer, he allows that English cameras are beautifully made. What finer photographic cabinet work could be desired than that which my late friend Meagher, Mr. George Hare, Messrs. Watson, Messrs. Rouch, and other firms have produced for many years past? I am here referring to stand cameras, of course, and I am open to back them for lightness and durability against any similar kind of instruments produced in America. Many readers of these lines, I am sure, have cameras by the makers named that have been in their possession for years and years, have made long journeys round the world, and have been used in the most trying extremes of climate, and yet are as good and as sound as when they left the maker's workshops. In this respect not even our highly ingenious American cousins could beat their British competitors, I am sure.

And, as to hand cameras, though the home-made articles are not so strongly in evidence as their American competitors, I fancy we are not so far behind in the matter of lightness and portability as the writer quoted seems to think. Really, not all English hand cameras are the "lumber yards," nor are the slides as thick as "packing-box" stuff, as he seems to be so anxious to believe. Messrs. Shew, Messrs. Beck, Messrs. Adams, Messrs. Rouch, Messrs. Redding & Gyles, and numerous other makers, have long been noted for very ingenious cut and rollable film cameras, which certainly cannot be called clumsy, and, above all, do not lack the crowning merit of durability. Were it not for hostile tariffs, it may be conjectured that a considerable number of them would find their way across the Atlantic, and then, perhaps, the Editor of the *Photo-American* would sing a different song. On the other hand, our friends over the water have to thank the blessings of free trade for the opportunity of "sending Cousin John all he wants," as the writer puts it.

"Cousin John," however, is denied the opportunity of returning the compliment. Strangely enough, a private letter from Rochester, N.Y., the seat of the American hand-camera industry, which I received a few days ago, contains the following paragraph: "Why does not some camera firm send cameras here? There is no cut-film camera on this market (United States), and I should think the Tella or Frena would go here." In a subsequent passage my friend gives the reason why he thinks cut-film cameras would be successful in the States. I have heard of more than one English manufacturing house which contemplates starting branches in the States. I am sure that our American friends would welcome competition on their own ground. At any rate, they could hardly complain of it.

From hand cameras to printing papers is a natural step. My correspondent, just quoted, gives me some details of the outbreak of opposition to the General Aristo Company, which was formed some time ago to combine all the large sensitive paper concerns in the States. He says: "Already several large jobbing firms are advertising a non-combine paper at fifteen per cent. less than the combine prices, and one large drug firm is importing paper and putting it into every drug store they supply with drugs." Evidently the General Aristo Company will have to fight hard to maintain its position. Combines or trusts of this kind do not thrive on English soil. I imagine that, if anything of the sort were started here, it would be equivalent to a signal for flooding the market with photographic manufactures from France, Germany, Belgium, and Austria, which are all practically next door to us and have free access to our markets. And our Continental competitors are not very far behind us in the science of catering for the requirements of photographers.

It is to be hoped that neither photographers nor photographic manufacturers who had intended being represented at the Paris Exposition next year will take any active part in the proposal to boycott the Exhibition which has been made by some emotional persons, not unnaturally shocked at the Rennes verdict in the Dreyfus case, and backed up by sensation-hunting journalists of the halfpenny London press. Leaving the political side of the matter out of the question, it is certain, from what has happened before in her history, that France will speedily forget and atone for the mistakes that have been made in her name during the past few years, and in that laudable desire she would be best supported by a hearty encouragement of her Exposition. Was it not the late George Augustus Sala who, soon after the Franco-Prussian War, wrote a delightful book descriptive of "Paris Herself Again?" Surely we all want to see France herself again; but the way to contribute to that desirable result is not by boycotting her Exposition and flinging mud at her because five military gentlemen's ideas of justice do not tally with our own.

It is from the two London photographic Exhibitions which open this week that a great many of the representative photographs for the Paris Exposition are to be chosen. I have had many inquiries from photographers as to how the process of selection is to be carried out. Few people seem to be aware that a joint Committee of the R. P. S. and the Camera Club has the matter in hand. Would it not be well if this Committee gave a little publicity to its existence? and may we know officially if, besides contributors to the Exhibitions, individual photographers who are not exhibiting will be given an opportunity of submitting work for selection? COSMOS.

#### AUTUMN AND AUTUMN WORK.

AUTUMN is now with us. The weather may not yet be "autumnal," but autumn is here all the same, and effects may be obtained at the present time that are not possible at any other period of the year. The foliage is yet full, though not perhaps so fully expanded as it was at the height of summer. The shadows are long, soft, harmonious, and transparent. In summer they are short and lacking in transparency, and look heavy in a photograph unless it is very full exposure is given and the development of the negative is very tentative. Those conditions do not obtain to the same extent at this season, by reason of the less altitude of the sun and its power; yet the light still is very actinic, often more so than when the sky is of a uniform blue and there are no light fleeting clouds about as there generally are now. We remember the late Mr. Vernon Heath stating, when giving evidence as an expert in a lawsuit, that the greater part of his best pictures were taken in the autumn. His famous series of pictures of Burnham Beeches, his best work in the opinion of many, were taken in the autumn; and by the shadows and foliage they show that such was the case.

While on the subject of autumn photography it may be mentioned that another effect may be obtained now that cannot be got, as a rule, at any other time unless under exceptional conditions. In the autumn and spring there are good and pronounced clouds about, and by judicious exposure and tentative development they can be secured in the negative



with the landscape, and no one will deny that clouds secured in the negative are infinitely better and more correct than any that can be printed in from a second one however good. But with negatives taken in the spring time the foliage is not at its full, as it is at the present time.

Again, at this season, about the time of the autumnal equinox, there are always a great variety of cloud effects obtainable that would be excellent for printing into pictures when clouds are not in the original negative, such, for example, as are taken in the summer, when there are no clouds in the sky. Therefore it is an advantageous opportunity for securing a stock of cloud negatives, for future use, while they are obtainable. While on the subject of cloud negatives, we would mention that the camera should not be, as is too frequently the case, pointed too much to the zenith. Negatives so taken will not harmonise with landscapes taken in the ordinary position of the camera; they should be taken with the camera placed as in taking a landscape. This may necessitate the camera being placed on an eminence, say a house-top, to secure an uninterrupted view of the sky at the desired angle.

#### FOREIGN NEWS AND NOTES.

**A Suggested New Printing Process.**—M. Léon Vidal, the editor of the *Moniteur de la Photographie*, suggests the use of a grained glass screen as the basis of a new method of printing. The tendency of modern photographic work has been towards the imitation of engravings or water-colour drawings. M. Léon Vidal thinks that those in search of novel effects might find it worth their while to make a positive from an original negative, and then a second negative through a grained screen. A grained print could thus be produced by the gum-bichromate, carbon, or any other process. Its characteristic would be that of a crayon drawing upon rough paper, and it is possible that the process might lend itself very effectively to three-colour photographic printing.

**Reduction of Bromide Prints.**—P. von Jankó recommends, in the *Photographische Rundschau*, a bath composed of—

Saturated alum solution .....	50 parts.
Four per cent. thiocarbamide solution .....	50 "
Acetic acid .....	1 part.

The prints should be immersed in the solution and rocked until the necessary reduction is effected. The process is slow enough to enable the operator to stop the right moment. The prints should be washed in several changes of water, which should succeed each other rapidly at first, to remove traces of the reducer and stop its action.

**Sensitising Plates for the Lippmann Process.**—In the *Photographische Correspondenz* Professor Valenta refers to the difficulties of colour sensitiveness. The gelatine film for mixed colour work must be thin, and, as this limits the latitude of exposure, the difficulty of obtaining good results is considerably enhanced. The colour sensitiser is an important factor in the problem. In proportion to the difference in sensitiveness for red, yellow, and blue, the difficulty of determining the correct exposure increases. The ideal should be a panchromatic plate; but, as this is not to be had, suitable sensitisers, that will give the nearest approximation, should be used. Cyanine and chinolin red have been recommended by Lippmann, and cyanine terythrosine by Krone. Cyanine is a very useful sensitiser for orange-yellow, but yellow-green and greenish-blue flag, and the action in the blue is many times more active than in the red. The addition of chinolin red overcomes the first of these difficulties, and erythrosine will reverse the relation between yellowish-red and green. It is therefore necessary to find a dye that will give equal sensitiveness for red or orange-red to blue-green. If the action in the blue should still be excessive, it may be controlled by use of a pale yellow screen. A dye of suitable character should yield a broad and rather vigorous band from C to E. Valenta finds from experience that glycin red is suitable, and it may be had from Kinzelberger of Prague. This dye renders green almost as well as blue, and the band extends from B $\frac{1}{2}$  C beyond  $\delta$ . It is also fairly sensitive. By adding 12 to 14 c. c. of glycin red (1 in 500) to each 100 c. c. of the emulsion described in Valenta's work, *Die Photographie in Natürlichen Farben*, very good results are obtainable. Lippmann has recently changed his method of preparing the emulsion, and now adds to a solution of gelatine, water, and bromide of potassium, very finely powdered silver nitrate. Emul-

sions thus prepared give very clean images and are very fine in the grain, but, after making comparative experiments, Valenta does not find the new formula better than that given in the work mentioned above.

**Brasswork.**—The *Photographische Chronik* gives the following formula for changing the colour of brass to a golden hue:—

Sodium hydroxide .....	5 grammes.
Milk sugar .....	5 "
Water .....	150 c. c.
Sulphate of copper .....	1 gramme.

The first two ingredients should be dissolved by heat in the water, and the sulphate of copper then added. Filter the solution and let it cool. The brasswork should be perfectly cleaned with an alkali, and immersed in the solution for a minute.

**Small Negatives.**—The *Deutsche Photographen Zeitung* publishes an article in which the advantages of small apparatus for the tourist are very clearly and forcibly enunciated. The favourite Continental sizes are 9 × 12 and 13 × 18 cm. These are both rather larger than our quarter and half-plate sizes. The *Deutsche Photographen Zeitung* recommends the dimensions 9 × 12 cm., also a current Continental size, and points out the gain in portability and speed of exposure. With a small size the amateur will not find the finest modern lens a very expensive luxury. The cost of plates is reduced to a minimum, and the fineness and depth of definition of the lens will enable him to make enlargements that will compare favourably with large direct pictures. Considering the ubiquitous nature of the English tourist, it would be a great boon if international sizes for plates could be adopted.

#### DEVELOPING PARTLY PRINTED GELATINE-CHLORIDE PAPER.

"Mr method," says Mr. Albert Hahn in the *American Journal of Photography*, "is that of Mr. William J. Wilson, who has succeeded in producing the most perfect results with gelatine-chloride papers—by development.

"The first point is to consider what is the minimum amount of exposure necessary for after-development. A faint image of the darkest parts of the subject should be visible about the degree necessary for platinum paper exposure.

"All the operations may be performed with dull gaslight.

"Incandescent gas or electric light may be used in place of sunlight for printing, an image being produced sufficiently intense for development in about fifteen minutes. A little over-exposure is not serious.

"After exposure, immerse the prints in a solution of potassium bromide, ten per cent. solution. This converts everything into bromide of silver, which is not so liable to fog under development as the chlorides or other silver salts.

"Five or ten minutes in the bromide is sufficient.

#### DEVELOPER.

##### A.

Hydroquinone .....	300 grains.
Eikonogen .....	120 "
Water .....	50 ounces.
Sulphite of soda .....	1 ounce.
Sulphuric acid .....	1 drachm.

##### B.

Carbonate of potassa .....	2 ounces.
Water .....	50 "
Bromide of potassium .....	120 grains.

"Mix the solution in about equal proportions, and add a drachm of gum-arabic solution (1 ounce gum, 1 pint water).

"Stop developing when the finest detail just begins to show, as there is a danger of carrying development too far. The image in the developer looks less dense than it is in reality, so that some judgment is needed to determine when to stop.

"After development, place the print again in a one per cent. solution of bromide of potassium, and wash for five or ten minutes in running water.

"Tone in the usual toning solutions if the colour obtained is not just what is desired."



## THE PERMANENCY OF PLATINOTYPE PRINTS.

An article appeared in one of the photographic papers not long ago, in which the writer thereof contended that prints made by the platinotype process were as liable to change as silver prints; in other words, that platinotype prints were not permanent. Photographers for some years past have been in the habit of regarding this process as the most permanent one on which they could make their prints, and it is to try and show that this process, if properly worked, will yield permanent prints, in the ordinary sense of the word, that this article is written.

It must be admitted that prints by any process, if the well-known rules for working them are not carried out, will alter; but in a silver print the actual image alters and deteriorates, whereas it is only the paper support, and not the platinum image, which alters in platinotype prints.

To prove this, let a platinum print, which has turned yellow, and whose image has turned a rusty brown colour instead of the pure black characteristic of the process, be placed for a few minutes in the following solution:—

Chloride of lime .....	2 ounces,
Carbonate of soda .....	1½ "
Water .....	20 "

and, when removed, the print will be just as good and brilliant as when it was first made, thus showing that the image itself was unaltered. It is advisable after this bath to treat the prints in a weak hydrochloric acid bath for a few minutes, and then wash as usual.

Now, surely this proves that the apparent deterioration of the print was only due to the acid which was left in the paper turning the paper yellow, and so causing the print to look as if it had faded. The actual image is not altered in the least, and from this it may be fairly said that, provided means are taken to rid the paper from injurious matter, the prints may be considered absolutely permanent.

After development it is necessary to pass the prints into three acid baths for a period of five minutes each, composed as follows:—

Hydrochloric acid .....	1 ounce.
Water .....	60 ounces.

Or, if preferred, citric acid may be used:—

Citric acid .....	1 ounce,
Water .....	10 ounces,

After this the print must be washed in plain water for about ten minutes, and then immersed in—

Carbonate of soda .....	1 ounce,
Water .....	20 ounces.

for five minutes, after which a final washing for ten minutes in water will complete the operation. This soda bath is intended to neutralise the acid in the pores of the paper.

If these very simple instructions are carried out, the platinotype worker will not be troubled with changing prints, but will be sure of prints which will remain things of beauty and a joy for ever.

E. W. HAWES.

## DARK LIGHTING.

PROFESSOR B. W. WOOD, of Madison, Wisconsin, writes to *Nature*:—

"I have been greatly interested by some photographs showing the rare phenomenon of dark lighting, which have recently been sent to me. So far as I know, the only explanation that has ever been offered to account for them is photographic reversal, due to extreme brilliancy. This appears to me to be wholly out of the question for two reasons. In the first place, a dark line on the picture, resulting from over-exposure of a very brilliant line, would be surrounded by bright edges, due to the lesser photographic action in the halation region. This is never present so far as I know, the dark flashes being minute black lines ramifying from, or in the neighbourhood of, the main discharge. Secondly, from what evidence I can gather, the dark parts of the flash are not those which appear most brilliant to the observer. Mr. Jennings, of Philadelphia, who in 1890 secured a remarkable picture (reproduced in *Photographic Times Annual*, 1891) showing a very brilliant flash with countless dark flashes covering the sky around it, tells me that the appearance to the eye was a brilliant white discharge, with fainter rose-coloured ramifications, the latter developing in the negative or rather positive, as dark flashes.

"Some years ago it occurred to me that a dark flash might be produced by a preponderance of infra-red radiations, which, as Abney has shown, undo the work of ordinary light on the plate. If we had a form of discharge capable of giving off very little actinic light and an abundance of infra-red light, it might come out dark on a feebly illuminated background. This is, of course, a very wild guess, with nothing to substantiate it; but the dark flash appears to be a reality, and a poor hypothesis is perhaps better than none at all. I have recently thought that the phenomenon might perhaps be explained in another way.

"We have a flash which appears darker than the sky behind it. It is inconceivable that the discharge could render the air in its path opaque, in the ordinary sense, to white light. But the light which illuminates the sky, in the case of these pictures, is not daylight, but light coming from another flash, that is made up of wave-lengths corresponding to the periods of vibration of the dissociated matter in the path of the discharge. Now, may it not be possible that in the dark flash we have a discharge, weak or nearly wanting in actinic light, which, however, renders the air in its path capable of absorbing to some extent the radiations of the wave-lengths which come from the bright flash?

"Such a flash might possibly appear dark on a background feebly illuminated by light, exclusively of these wave-lengths; in other words, may we not have in the path of the dark flash dissociated molecules, radiating but feebly, and capable of taking up vibrations of periods similar to their own, coming originally from a simultaneous brighter discharge?

"It might not be impossible to reproduce the phenomenon by photographing a spark in front of a light background. Sparks are almost always taken against a black background, which would account for the absence of dark flashes in pictures of artificial discharges. A heavy main spark with lateral branches would seem the most suitable kind to employ.

"The best method of attacking the problem experimentally, it seems to me, would be a search for selective absorption in a partially exhausted tube.

"If the source of light were continuous, any absorption would be unnoticeable unless persisting for some time after the discharge (which is unlikely), for the time between successive discharges is great in comparison to the actual duration of one of them. Even in the case of so-called continuous discharges produced by high potential batteries, the discharge is often, and may always be, intermittent in character. The source of light should then be of no longer duration than the discharge occurring in the gas the absorption of which is to be examined.

"I can think of no way of producing a white or continuous spectrum source of as short duration as, and contemporaneous with, the discharge in the tube, but by employing two tubes differently excited, the one as a light source, the other as an absorption tube, some results might be obtained.

"Professor Trowbridge found that an Argon tube emitted a blue light or red light according to whether it was illuminated by means of an oscillatory or non-oscillatory discharge.

"By using the blue tube as the source of light, and the red tube as the absorption tube, the two being arranged so as to be illuminated simultaneously, it might be found that the red tube had the power of absorbing, to some extent, the blue radiations from the other.

"I hardly think results would be obtained, but the experiment seems worth trying.

"A picture taken by Mr. H. B. Lefroy, of Toronto, sent to me by Mr. Lumsden, Secretary of the Astronomical and Physical Society of Toronto, has some very curious appearances. There is an exceedingly brilliant flash running down the centre of the plate, illuminating the sky quite brilliantly in its neighbourhood. In its immediate vicinity, though not joined to it in any way, are innumerable dark, thread-like markings, which in places seem to cross each other, forming meshes. Mr. Lumsden assures me that the testimony of all photographic experts who have seen the plate is to the effect that markings of that description could only be produced in the exposure—that is, they are not due to faults in the film or the results of imperfect development. The fact that they are found only in the immediate vicinity of the bright flash is additional testimony in the same direction. These markings are wholly different from any that I have seen, not having the form of branched flashes. Something in their resemblance to photographs of sound-waves, started by a spark, which I have recently made (see *Phil. Mag.* for August), suggested to me that they might possibly be due to the illumination of the sound-wave, due to a powerful discharge by a second discharge. Under ordinary conditions, that is, with a uniformly illuminated background, such waves would, of course, be invisible, but conditions might possibly arise, due to the proximity of black clouds, under which they might show, a sort of 'Schlieren Methode' on a large scale. I have not attempted yet to plan an arrangement of clouds which, by acting as screens to light coming from certain directions, might render visible a region of the air in which the optical density underwent a rapid change.

"Mr. Lumsden's picture shows very black clouds irregularly distributed and in close proximity to the flash.

"The idea of a photograph of a thunder wave is a pleasing fancy, at all events.

"It seems to me that it will be impossible to formulate even a reasonable guess as to the cause of these dark flashes until a good many pictures are brought together for comparison and as much testimony as possible secured as to the appearance of the flashes to the eye. Personally I have seen very few of the pictures, and never the original negative.

"My intention in writing this letter is not so much to advance theories accounting for the phenomenon of the dark flash as to re-awaken an interest in the subject, and bring out ideas from persons qualified to treat the matter."



### "PAINTERS WHO HAVE INFLUENCED ME."

On Wednesday evening, the 13th inst., a large number of the members and friends of the Leeds Camera Club foregathered at the Club Rooms, Grand Restaurant, Boar-lane, on the occasion of the opening lecture of the session, to hear Mr. J. Craig Annan, of Glasgow, lecture on the above interesting subject.

The lecturer, who is a well-known exhibitor at all the leading exhibitions, had been induced by the enterprise of the Club to give the address, which is the first delivered by Mr. Annan in England.

The President, in introducing the lecturer to the audience, said that his duty that evening was a very pleasant one. Mr. Annan's works were well known to them, and no doubt they had all seen and admired them; he was working in the same direction as themselves, and anxious to help others to the same position to which he had attained. He would show them that by artistic tastes one could make a photograph something more than a mere machine-turned-out article. On behalf of the Leeds Camera Club, he had great pleasure in asking Mr. Annan to give them his lecture.

Mr. Annan, who was heartily received, commenced by stating that, when asked to give a lecture on painters, he had promptly replied, without considering what such promise involved. He had given the subject the consideration of his leisure moments, and the results had been a revelation to himself. It was not to be expected that all, if, indeed, any of them, should feel as he did on the subject, as it was a matter of personal sentiment, and one on which they each could feel for themselves.

At first glance of the subject he was overwhelmed with a formidable array of masters and nationality, in whose works he took interest and delight: Rembrandt, with his marvellous expressive powers and mastery of light and shade; Frank Hals, overflowing with the love of life, suggesting to the observer that his greatest works are but play to him—behind all he had an enormous force which he could exert if he chose to do so. The Italian painters—Titian, Tintoretto, Botticelli, and others—were touched upon, and many other famous works alluded to.

Passing on to Germany, we had the master of Nuremberg, Albert Dürer, who surprised us with the variety of the arts he excelled in, and his superiority in every one of them. Then, in later days, and in our own country, the group of masters we had had in Sir Joshua Reynolds, Gainsborough, Romney, and Raeburn, and before them, though not precisely of this country, Sir Anthony Vandyck, courtier as well as painter, his pictures full of that grace, and strength, and dignity which befit those who surround a throne; whilst a century before him was Hans Holbein, whom, in the opinion of the lecturer, it would benefit photographers most to study. Adverting to the fact that he had not alluded to the famous landscape painters, he said, on reconsideration he came to the conclusion there was no omission, his greatest pleasure being the study of those masters he had named, and, much as he could enjoy and delight in the works of Constable, Turner, and their contemporaries, yet the former had most influenced him.

The necessity of photographing a landscape as it actually is, without the power of selecting the point of view, and the impossibility of subduing any portion of the subject as regards its form and shape, was most exasperating to the photographer who had revelled in the grand, massive compositions of Constable or the delights of Turner. In portrait photography one had the subject more under command; the choice of subject, light, dress, and pose might all be made by the photographer, and, while it could be said that a photographic portrait seldom did approach, and possibly never could equal, a masterpiece of painting, yet their hopes led them to trust that, when some real master appeared, photographic portraits might be produced which would take a place among the world's art treasures for all time.

As students of photography, therefore, they must select from those various qualities in the works of painters those compositions it was possible for them to embody, and consider in which of those painters the qualities were most evident, and from which, therefore, they were most likely to draw inspiration.

Another point was, how much they should allow themselves to be influenced by any master, and a line between influence and mere imitation must be drawn. One frequently read in the criticism of exhibitions that, in the opinion of the reviewer, a certain work was manifestly produced under the influence of a certain painter, and the inference intended to be taken was that the work was to be deprecated on that account; but, in considering the question calmly, as he did, if the producer had been sufficiently influenced by certain great masters, and had absorbed and followed the intention of that master, then he declared that it was a credit and an honour to have been able to follow to such an extent that his work is a digest of the master's and not a mere superficial imitation. If it is a copy only, then the incompleteness of the work would be stamped on it and would condemn its producer; but to be influenced in a legitimate fashion was quite another matter, for without influence they would be back among the cave dwellers, and the most daring genius amongst them would be scratching a rude resemblance of his dog upon the doorway of his dwelling.

Genius has been described as the art of taking pains, and he advised all of them who aspired to introduce art into their pictures to miss no opportunity of studying the work of the masters. If they could not see

the original works, reproductions were excellent and cheap, and he counselled them to study and observe to their utmost capacity the spirit of the authors, without the slightest fear that by doing so they would become plagiarists. If they had the proper receptive faculty, an impression would be made on their minds which, though it might appear to pass away, would only lie fallow for a time. It would enable them to introduce ideas which would otherwise have escaped their attention, and enable them to produce unconsciously a successful picture which was their own and yet inspired by another. As an illustration, he might mention a certain experience of his own portrait of Miss Burnett, produced in 1893, which was to a great extent influenced by a picture he had seen, he could not exactly say where, of Erasmus, by Holbein, and but for the influence of this or some such picture he was positive Miss Burnett's portrait would not have been produced. Having explained the grounds for his preferences, he thought no painter had interested him more than the one he had alluded to—Hans Holbein—whose works were widely scattered in this country, but reproductions could frequently be met with, and from a photographer's standpoint they were as beneficial as the pictures. The magnificent collection of drawings in Windsor Castle was an education to any artist.

Holbein could hardly be said to be a member of any particular group of painters, but he made his entrance on the stage of life at one of the most interesting periods of history, at a time when all the nations of Europe were awakening from the lethargy of the dark ages. His earliest achievements were considerable, and his originality consisted not in eccentricity, but in the simple breaking away from all convention and making a close and intelligent study of nature. The lecturer traced the chief events in the career of Holbein and mentioned the more important pictures painted by him, remarking that in most of the pictures exhibited on the screen the backgrounds were absolutely plain, thus showing up the beauty of the figures thereon. As a photographer he could tell them it was very much easier to make a respectable picture with a fancy background than to make a real fine picture with a plain background. To him it was always a sign of weakness to see a pictorial background. He concluded by expressing the hope that what he had said might help them in the study of pictures and also in their photographic work.

Mr. Councillor Howgate, in proposing a vote of thanks to the lecturer, expressed the pleasure it had given him to be present and his gratification that a Leeds audience had been privileged to hear Mr. Annan, a lecturer who was so ably qualified to deal with his subject.

Mr. Bissington seconded, and Mr. Gosh supported the vote of thanks, which the lecturer suitably acknowledged, and the proceedings terminated.

### THE ALLEGHENY OBSERVATORY OBJECTIVE.

MR. J. A. BRASHEAR supplies the *Scientific American* with some particulars regarding the new Allegheny Observatory and the glass which he is to make for them. He says: "The old Observatory, in which Professors Langley and Kuhn did such good work, became unfitted for modern research; first, on account of its rather meagre equipment, but, what was far more important, the city has so encroached upon it that the atmosphere is usually vitiated by the smoke from houses, mills, &c. As Chairman of the Observatory Committee, I first had the good fortune to secure a splendid site in the very centre of the new park given to Allegheny City by its generous citizens, which is situated beyond the smoke environments. The place set apart for the observatory is a hill in the centre of the park, 552 feet above low-water mark of the Ohio River and about 1200 feet above sea level, and it is so situated with reference to the two cities of Pittsburgh and Allegheny that the prevailing winds give us a practically clear atmosphere. It is a fact, however, that a small amount of smoke diffused through the atmosphere contributes to steady definition in solar work, to which, I think, we shall devote most of the time of the new Observatory.

Plans for the new Observatory are now nearly complete, Professor F. L. O. Wadworth, the new director, having devoted many months to a careful and critical study of the detail of the building and instrumental equipment, and, if the plans are carried out to the fullest extent, we shall have an Observatory for astro-physical research second to none in the world. Not the largest telescope—we are not after that—but a complete equipment for work in the domain of the new astronomy.

Our plans now are to have a thirty-inch clear aperture telescope, the discs for the objective of which have already been ordered from Mantois, of Paris, and will be ready for us about the first of the year. A large reflecting telescope, perhaps of not less than a thirty-six-inch aperture, will be constructed for spectroscopic work. A thirteen-inch refractor will be erected and equipped solely for the use of the citizens, or, in other words, a free observatory for the use of the higher classes in the public schools, and any and every one desiring to see the "beauties of the skies." This has always been a hobby with me, for well I know, when a boy, how I would have given all the little I had to look in a telescope. But I am getting off the track. In addition to the telescopic equipment, we expect to have an immense siderostat, by which we can use the great objective for projecting the sun's image on the slit of the large spectro-heliograph, which will, by this arrangement, not have to be carried by the eye end of



the large telescope, but will remain stationary in a specially constructed underground apartment. The entire basement of the Observatory will be fitted up for correlated research, i.e., especially in the domain of solar physics, and the beam of light from the great siderostat will be brought down to the basement, and by suitable mirrors made available in every department of the Observatory. The building will be provided with a sixty-foot dome, a thirty-foot and a twenty-six-foot dome. The architectural design of Mr. T. E. Billquit has been accepted. It is classic in style, and will look very beautiful on the hill in the park. It will be visible over an area of perhaps fifty square miles.

## PHOTOGRAPHY OF THE STOMACH.

[Scientific American.]

DR. MAX EINHORN, of New York city, made a communication to a medical journal some seven years ago regarding "ga-tro-diaphany," in which a miniature Edison lamp, in a special mounting attached to a soft rubber tube containing a wire, was introduced into the stomach, so that an examination can be made of it. This method was called "ga-tro-diaphany," as the stomach became translucent. The object of this device was to show the size and situation of the stomach to the eye and also to recognise tumours or other gross anatomical changes of the anterior wall of the stomach. This was, of course, a different apparatus than the "polyscope," which is used for looking into the stomach, and was not intended to replace any such device. It has been found to be of considerable value to surgeons.

In the same paper Dr. Einhorn described a camera for photographing the interior of the stomach; but, owing to technical difficulties, the camera was not constructed by Dr. Einhorn. Such a camera has, however, been perfected by Dr. Fritz Lange, of Munich, Germany, on almost the identical lines given by Dr. Einhorn.

The camera is a marvel of compactness, and is constructed on exactly the same principles as all cameras for taking moving photographs, although, of course, there is no attempt made to combine them so as to project the actual operations of the stomach. The camera itself is swallowed by the patient, and it contains a small electric lamp for illuminating the walls of the stomach. A photographic film twenty inches long and a quarter of an inch wide is wound at the bottom of the camera. One end of the film is fastened to the cord, which runs freely in the tube. When the cord is pulled, the film is drawn slowly past the lens. The cord and the conducting wires must, of course, be swallowed with the camera itself. When the camera reaches the bottom of the stomach the surgeon begins to pull the cord, which runs the film past the lens. The electric light is then turned on, and, after the sensitive film has been impressed with the image, the current is turned off and another section of film is brought into play until the requisite number of pictures have been obtained, then the entire apparatus is withdrawn from the stomach of the patient and the films are carefully developed and enlarged.

## A MACHINE FOR CUTTING PRINTS.

MR. CHARLES HENRY WORTHEN, of Taunton, Massachusetts, U.S.A., who has invented a machine for this purpose, says, in his Patent specification, that photographic prints must have clean cut, sharply defined edges, necessitating the use of an extremely keen trimming cutter, and the print in course of trimming is placed commonly upon a glass or metal support to aid in securing the desired smoothness of edge.

Inasmuch as each print must, as a rule, be trimmed separately, the keenness of the cutter wears off very rapidly under the condition noted, and the cutter must be sharpened frequently, with considerable annoyance and no small expense.

To obviate the attrition of the hard surface of the metal or glass upon the cutter, a trimmer has been provided in which a rotary cutter, supported from above by a trolley-like arrangement, and rotated positively by a belt, is moved along the end of a board, over which projects the print to be trimmed; but the trolley support bends under the pressure of the operator's hand, the cutter gets below its proper cutting position, and, adding to these the absence of suitable supporting and clamping means for the projecting portion of the print, the result is that the latter is frequently crimped over and chewed off instead of being cut properly.

Mr. Worthen proceeds: "I have instanced the difficulties of trimming photographic prints properly, as typical of the severest requirements to which a successful and durable cutting device is subject, and my invention has for its object the production of a cutting device which shall meet these requirements fully, and be perfectly adapted for use as a photographic print-trimmer, but I contemplate its utilisation in any class of work for which it may be qualified by the improvements constituting my invention.

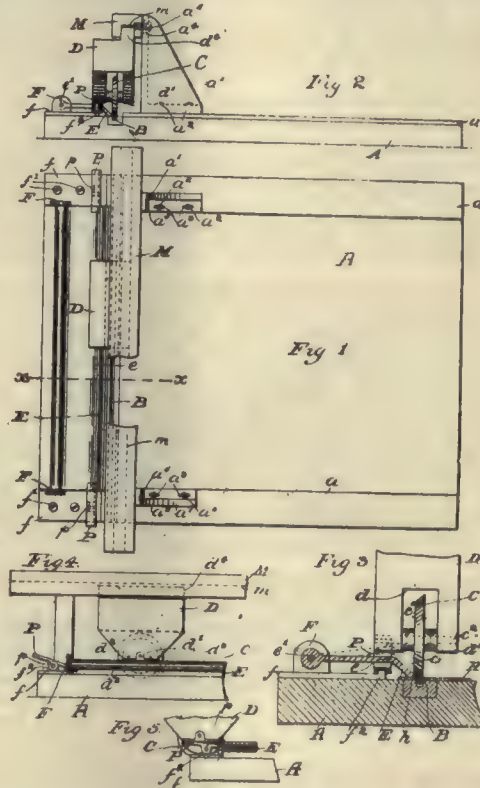
"A designates a work support taking the form, in this instance, of a common type of trimming board, and which may be of any suitable material, preferably wood for the sake of lightness, and, if of wood, provided preferably with a cutting edge, B, which may conveniently be

constructed of a bar of metal inlaid flush with the surface of the support and having a longitudinal surface groove, one wall of which constitutes the 'edge.'

"The work support may be, and preferably is, provided with one or more suitable guides, a, slightly raised above its surface and its shape and proportions may vary as desired or found convenient.

"In accordance with my invention, a travelling cutting member is provided having a cutter with a straight edge to run along and co-operate with the wall or 'edge,' B, and an inclined or bevelled abutment is also provided parallel with the 'edge,' B, the travelling member having a bevelled portion to ride along the bevelled portion of the abutment, which latter is inclined toward the 'edge,' B, so that the effect is that, when the members are in operative relation, and the cutting member is being run along the edge of the abutment, it tends constantly to slide down the bevelled portion of the latter until the straight edge engages the fixed 'edge.'

"The disposition of the bevelled abutment and the co-operating bevel on the travelling member may be varied somewhat, but I have found a convenient arrangement thereof to be afforded by forming the bevel of the travelling member on the cutter itself, and, in the instance illus-



trated, have made use of a rotary cutter, c, mounted for convenience of manipulation in a carriage, D, of desired or suitable contour.

"The form of bevelled abutment which can be used most conveniently with a bevelled rotary cutter of the type illustrated is shown at E, being closely adjacent the fixed edge, and being formed of a piece of sheet metal, or other suitable material, which is preferably hinged or pivoted at its rear end or edge on an axis parallel with the fixed 'edge' to permit the abutment to be swung upward from the latter.

"To prevent undue protrusion of the abutment above the support, it is bent preferably, as at F (see fig. 3), and for the sake of stability may be mounted in suitable bearings, G, on the support, A, being shown in this instance as lugs bent up from a metal plate, H, secured to the board, A, by suitable fastening means, as the screws, I, these lugs receiving a spindle, J, which serves as the axis of the abutment.

"When thus constructed, the abutment may be utilised as a clamping member or means to clamp the edge of the photograph, print, or other work adjacent the fixed edge, and such a clamp is particularly desirable when use is made of a bevelled rotary cutter, inasmuch as such a cutter tends constantly to cut in a circle, and the print can be firmly held to prevent it from being cramped under this circular action of the rotary cutter, which otherwise would be communicated to it.

"The use of the bevelled abutment as a clamping member is facilitated by the co-operating bevelled surfaces, as will be readily understood from fig. 3, where it will be seen that downward pressure upon the carriage, D, will be communicated through the cutter, c, to the abutment, E, and at the same time that said bevel is causing the straight edge, c, to engage



firmly with the fixed 'edge,' *n*, the cutter is forcing the abutment to clamp the edge, *h*, of the print or other work, *n*, against the surface of the work support, holding it firmly during the cutting operation.

"It will be understood readily that by this arrangement the clamping pressure is applied to the member, *x*, automatically at the point and time when it is most needed, that is, just as the cutter, rotary or otherwise, is approaching the cutting point, the effect of the pressure on the member, *x*, of course, extending for a little distance before and behind the point at which the cutter may be at any given instant.

"The carriage, *v*, may be of any suitable form, and the cutter mounted therein in any convenient fashion, in this instance the carriage taking the form of a block, in a recess, *d*, of which is mounted the cutter, *c*, on a journal, *c'*, entering suitable bearings, *d'*, of the carriage, said bearings being illustrated as metal plates with holes, *d''*, at the end of the journal and attached to the carriage by suitable fastening means, as the screws, *d'''* (see fig. 4).

It is within the spirit of my invention to use the cutter without any guide or track other than the fixed edge and abutment, but it may be found convenient to use a guide rail or track, and accordingly I have illustrated for use, when desired, a rail, *m*, supported above the surface of the work support to permit passage of the work thereunder, and having a contour suitable to co-operate with the carriage, *v*, such co-operation being effected, in the instance illustrated, by an undercut groove, *m*, in the rail, into which enters an upward projection, *d'*, from the carriage (see fig. 2).

"The rail, *m*, may be supported in desired position by any suitable means, and one convenient form of such means is shown in the shape of risers, *a'*, secured to the work support by suitable fastening means, as screws, *a''*, the latter preferably passing through slots, *a'''*, for the sake of adjustment, while similar adjustment may be provided for between the rail, *m*, and the risers, *a'*, by slot and screw connexions, *a'* *a''*.

"The carriage, *v*, may be grasped by hand and operated to and fro along the cutting edge, or may be operated by any other suitable means.

"As in accordance with my invention, the travelling member co-operates with the clamping member to operate the latter to clamp the work to the work support during cutting traverse, so also, in the preferred form of my invention, it is adapted to operate the clamping member to give clearance to the work for insertion or withdrawal.

"Any suitable means to effect this end may be adopted, and I have illustrated one form of construction for the purpose, comprising a lever, *p*, fulcrumed at *p* on an upturned lug or projection, *f'*, of the plate, *f*, one arm of the lever being extended into position to engage the clamping member, *m*, while the other end is extended into, and near the end of the path of, the travelling cutting member, so that, when the latter is brought into the position shown in fig. 5, the lever is tipped and raises the member to give clearance for insertion or withdrawal of the work.

"One of these levers or equivalent means may be provided, if desired, at each side of the clamping member, as illustrated.

"Considerable variation in the construction and arrangement of parts may be made without departing from the spirit of my invention, and I do not limit myself to the exact construction illustrated and described otherwise than as set form in the claims."

#### EXTRACTING AND ENLARGING SINGLE FIGURES FROM GROUP NEGATIVES.

It frequently falls to the lot of most photographers to undertake the enlarging of a small head or single figure which is contained in a negative or ordinary print, and is surrounded by other figures, such as are commonly seen in groups, and it often happens that such figures, by reason of their surroundings overlapping part of the same, cause no small amount of difficulty to a photographer when attempting to extract the figure for the purpose of future enlargement.

In all cases where the original negative is obtainable, there is no question as to the advantage of working on the same in preference to endeavouring to gain similar ends by manipulating a print made from such negative; but it often happens that the original negative is not forthcoming, and then there is no alternative but just to do the best with what material exists, such as a simple silver print.

Work of this description, as a rule, is seldom required from pictures that have been made within a recent period, but almost invariably fall to be conducted from photographs taken many years previously, and which are printed on albumenised paper, the texture of which is far more liable to offer difficulties than would be the case where they are printed on the more modern samples of Aristo or highly glazed gelatine or collodion surfaces.

A striking example of this sort of work has recently come under my observation, and which has proved of considerable interest in more ways than one. In the first place, the picture in question was made by means of wet collodion so far back as the year 1865. This was printed at the time on a sample of single albumenised paper, and, notwithstanding that this silver print has been subjected to the usual exposure in a family

album, at the present moment it is absolutely free from any symptoms of fading, and is a strong proof of the permanency of a well-executed silver print by means of single albumenised paper.

So far back as the year 1865, the taking of groups, especially inside studios, by means of wet collodion was generally done in small dimensions, and therefore each of the figures (or faces, rather) is very small in the picture to which reference is being made; these probably do not exceed a quarter to three-eighths of an inch, the whole group of eight people being printed in *carte-de-visite* size.

We hear a good deal nowadays against the permanency of pictures printed by means of silver. Yet here is an instance where a print is to all appearances as fresh to-day as it was thirty-four years ago, and is a striking tribute to the work turned out by the photographer whose name appears on the back of the card.

Somewhat recently the writer had the good fortune of spending a pleasant time with one who is now without doubt the oldest photographer in the West of Scotland, and who was an intimate friend of the brothers Mactear, and working alongside of them in the very first days of Daguerreotype and wet collodion. When speaking on the question of permanency, this gentleman remarked, "Oh, before double albumenised paper was known fading was never thought about." But with its introduction a sad change was brought about, and he now can point to proofs innumerable of his assertions, maintaining that all his prints dating back from the earliest days of silver printing are quite permanent, but those printed in after-years seldom stood at the outside beyond six or seven years at the best.

There is no doubt, however, that the grain of the paper is liable to cause more trouble when such small heads have to be enlarged from prints on single albumenised samples, and to avoid this grain, when work of this description has to be done, several methods have from time to time been advocated. One of these is to apply to the surface of the print a coating or wash of water-colour pigment, blocking out all the surroundings of the head it is desired to extract. Ivory black and Chinese white are, when mixed, suitable pigments to employ for this purpose, any depth from black to a light grey being easily obtained; the application of such a pigment to the face of a silver print will, with care, cause no injury, and, even in cases where the object or head is very small in size, there is no difficulty to trace round the outlines of the face with the aid of a finely pointed sable pencil. When this first operation has been successfully accomplished, a negative in slightly enlarged form is made in the usual way, and this is subjected to a very thorough retouching, which will, if properly done, get rid of any coarseness which is almost certain to manifest itself. Enlargements made from negatives produced in this manner yield good results when finally worked up in black and white.

Another method which also yields excellent results is sometimes possible of accomplishment, having the further advantage of not requiring the application of any pigment to the surface of the print. This is done by providing a cut-out mask that just fits nicely around and suits the shape of the head that is being extracted; but how is any one to provide such small-sized masks as from three-quarters of an inch or thereby? Such masks are certainly not a marketable commodity, but larger sizes are, and any stock of lantern masks can be utilised for the purpose. When it is desired to mask off, say, the head and shoulders of a figure in a group, a lantern oval mask having a white surface on one side must be procured—any dealer will supply them in various shapes, and, having obtained one that just suits the shape required, it should be placed against a piece of black velvet and pinned to a board—the white side out, of course; this is then photographed in reduced size on a slow lantern plate, and, if a small stop be used and the plate backed and developed properly, a negative will be produced having clear glass in the centre of the oval, and sufficient density around it to enable it being superimposed on the glass side of the negative which has been made from the paper print, and which it is intended to employ in the final enlargement.

In copying the paper print much may be done to keep back the grain of the paper by so placing the picture in the best light for the purpose. This may mean using a somewhat direct source of lighting, but in nearly every case it will be more or less noticeable, and the negative, therefore, has to be skilfully retouched. In saying this I am quite cognisant that there are those who dispute retouching in every shape or form, but my experience has taught me this, that any one who has to cater for the public taste and to earn his bread and butter by means of photography cannot do without practising it in nearly every subject and branch of work, and I should like to know what professional can honestly say he never resorts thereto.

The fact is, modelling is an absolute necessity in nearly every branch of photography, and especially is this the case in the work referred to, and not only must the modelling be applied to the negative, but the final enlargement will also be most wonderfully improved by its aid also.

It has been said that, in all cases where the original negative is obtainable, it is much to be preferred that it should be employed instead of a print from it. Of course, there will be no need for anything like the same amount of modelling when the original negative is available, and very probably no retouching of any kind will even be required, all that is necessary being the provision of some means to shield off objectionable surroundings to the head, and even in this event the work



can be accomplished without manipulating the negative at all. In many cases this is the most desirable method to follow, simply because it does away with any tampering with an original, and very possibly a highly prized, negative, so that, in cases where the masking can be effected on the surface of the enlargement, it is better to arrange for it than to do so on the face or glass side of the negative.

To mask out objectionable surroundings to an enlarged head is by no means a difficult operation when proper materials are at hand for the purpose and the system employed in enlarging permits of it.

In large sizes, special cut-out masks will be required, but in smaller sizes any ordinary paper cut-out mount may be employed, provided the edges of the cut-out are true, so that, having selected the cut-out aperture, which suits the size and shape of the head and shoulders of the figure when it is projected in enlarged form on the copying board of the easel, and having carefully adjusted the focus of the enlargement, the sensitive paper is placed in position, and by means of the non-actinic cap of the lens the image is projected on same. The mask is then fixed in position over the sensitive paper and the exposure made in the usual manner.

The services of a good printing frame may be utilised for holding the paper and cut-out mask *in situ*, and, when the enlarging is accomplished by daylight, it is easily slipped into its proper position on the easel, and much comfort experienced in executing enlargements in this manner.

The vignetting of enlarged heads can also be accomplished by employing a suitable cut-out mount between the lens and the sensitive paper, arranging this at the proper distance in front of the easel, and, when the form and other conditions of the negative permit of vignetting being resorted to, there is no doubt is a very desirable method to follow. It must be borne in mind, however, that a few simple attachments will be required to hold the vignetter *in situ* during exposure. This may mean merely tacking the cut-out mask to a lath or flat stick, and nailing it on some support that will hold it steady during exposures, and the nearer it is placed to the sensitive paper the smaller the circle of light, and *vice versa*. But this is easily judged by pinning a sheet of white paper in the position the sensitive material is to occupy.

In using glass shields made in the manner suggested by copying white masks on lantern plates the utmost care will be required to obtain absolutely clean, clear results, and, if on development of the plate it is seen that the black velvet from over-exposure has caused a reduction of the sensitive emulsion at those parts, the negative should be treated to a local application of some reducer whereby such deposits are removed.

These glass shields are very useful, especially in cases where several enlargements are required from the same negative. By using these shields attached to the glass side of the negative every enlargement is produced in exactly the same form, and, if the same treatment is accorded each in exposure and development, there should be no appreciable difference between any of the results obtained by this method of shielding. With some of the other methods it is not so easy to get a number of enlarged prints all alike.

T. N. ARMSTRONG.

### THE LANGFIER STUDIOS.

SINCE their completion, four months ago, the studios of Messrs. Langfier, Limited, 23A, Old Bond-street, W., have been visited, we are informed, by some 1500 sitters, chiefly drawn from the aristocratic sections of society, and the Company's *clientele* is daily increasing. Theatrical group and portrait work, which was originally intended to form a prominent part of Messrs. Langfier's business, has been practically abandoned. The very fine quality of the portraiture which is produced at Bond-street has attracted a different and more remunerative class, and the result is that the Langfier studios are entitled to take rank amongst the leading photographic establishments of the day.

From a tastefully decorated entrance-hall the studios are approached by a lift, and the visitor speedily finds himself in a large reception-room, which is an art gallery in itself, showing as it does a very large collection of Messrs. Langfier's work. The studio, dressing-rooms, &c., are adapted for the most refined tastes—in a word, as the current phrase goes, everything is done in the best of style, and sitters, particularly those of the gentler sex, cannot fail to be pleased by the agreeableness of their surroundings.

For his services in connexion with the recently held bazaar in aid of the funds of Charing Cross Hospital, Mr. Langfier received the unique compliment of election to a Life Governorship of that institution. The Company's business is extending in several directions, and the production of photographic Christmas cards on a large scale is already receiving attention. Printing works are to be taken in the suburbs, and at an early date it is anticipated that one or two provincial branches of the business will be established. It is only six years since the Langfier studios in Glasgow were opened. During the few months that the principal centre of operations has been transferred to London, Langfier portraiture has won for itself very considerable renown, and the enterprise, skill, and energy at the Company's command give the greatest auguries for its future prosperity.

### THE LATE W. K. BURTON.

WE are sorry to have to announce the death of Mr. W. K. Burton, which took place on August 1, at Tokio, Japan. The deceased gentleman had for a considerable time past resided on the island of Formosa, and had there suffered from a malarial complaint, which probably was the indirect cause of his death. Mr. Burton was about forty-six years of age. It is a melancholy coincidence that his younger brother, Cosmo Innes Burton, at one time also a contributor to our pages, died a few years ago in the East, whither he had gone from Edinburgh to take up an official appointment.

W. K. Burton was the son of the late Dr. John Hill Burton, of Edinburgh, at one time Historiographer Royal of Scotland. As a writer on photography Mr. Burton first became prominent in the early eighties. Emulsion theory and practice supplied him with a fruitful theme for a facile pen. He owed much to the encouragement which he received from THE BRITISH JOURNAL OF PHOTOGRAPHY and its late editor, Mr. W. B. Bolton, for it was in conjunction with the latter that many of Burton's experiments were carried out on the old premises of the JOURNAL in York-street, Covent Garden. Indeed Burton, like many other prominent men of the gelatine era, traced the foundations of his position and influence to the opportunities given him by THE BRITISH JOURNAL OF PHOTOGRAPHY, with which he remained in occasional and sympathetic communication up till the spring of the present year.

An able and careful experimentalist, Burton was a luminous writer on most branches of applied photography, and his little beginner's book, at one time called the *A B C of Photography*, was one of the most successful text-books on the subject ever issued, as it has passed through numerous editions, and is still popular.

Sanitary engineering being his profession, Burton, early in 1887, left for Tokio, where, at the Imperial College, he was appointed to a Professorship. Before his departure he was entertained to a complimentary dinner organized by this JOURNAL, of which he had so long been a valued contributor. In Japan his interest in photographic matters showed no abatement, and his contributions to the periodical literature on the subject were always marked by sound doctrine and clearness of teaching. A useful set of exposure tables owed its origin to Burton, but his name can scarcely be said to be attached to any original work of first-rate importance. He was a perfect type of the painstaking and experimental photographer, with a happy gift of being able to transmit his knowledge to others. Perhaps he left England before his undoubted photographic abilities and instincts had reached their fullest fruition.

Burton's premature end will, we are sure, be deeply regretted by his many friends in Britain.

### SIGHT FOR THE BLIND?

WHAT degree of credence is to be attached to the following experiments and statements we must leave our readers to judge for themselves: The Central News is informed by Dr. Peter Stiens, the Russian electrician, that he has applied an electrical apparatus of his invention to several blind persons, and has made them able to see light and the shape of objects around them.

In the course of an interview with a member of the staff of the Central News, Dr. Stiens said:—

"I have been working on this invention for some years, and have every confidence now that I shall soon bring it to such a state of utility that blind persons by its aid will be able to see with their brains just as ordinary people see through their normal eyes. In a word, my invention acts in place of the eye."

Dr. Stiens then suggested that the interviewer should judge for himself, and the latter describes what happened as follows:—

Dr. Stiens took me into a small room and blindfolded me. He did this so effectually that not a ray of light reached my vision. All was absolute darkness. Then he lighted matches in front of my face, so close, some of them, that I could smell the burning sulphur, and could feel the heat of the flame near my flesh. But I could see nothing. Then he connected me with his apparatus. The blindfolding substance was not touched or altered in any way, but in place of the darkness there appeared a white light before me—a light that looked very much like the ordinary light of day. Then Dr. Stiens held up an object before me.

"What is this?" he asked.

"A pair of pincers," I replied.

"Quite right," answered the electrician; "and what is this? what shape is it?"

He now held up another object.

"It is round."

"Exactly. Now what can you see?"

"Only the white light."

"Exactly."

Then he switched off something and all was utter darkness again.

"I have taken off the apparatus and now you can see nothing."

"Exactly," I answered.



He took off my bandage and I found myself in the broad daylight again. "I will show you something else," he said. "Stand before this wooden partition."

I did so, staring at a blank expanse of wood, my eyes about six inches from it.

Dr. Stiens blindfolded me again, bidding me stand still, in the same position, before the wooden partition. Then he applied the electrical apparatus and I could see the white light in front of me as before.

"There," observed the inventor, when he had unbandaged my eyes, revealing the wooden wall in front of me, "you didn't see that light through the wood with your eyes—you saw it directly with your brain."

### PHOTOGRAPHIC CLASSES AT THE BATTERSEA POLYTECHNIC.

We append particulars of the classes in photography at the Battersea Polytechnic, which are under the direction of Mr. E. Senior.

*Elementary* (25 lessons) Mondays—Lectures, 7.30 to 8.30. Fees—Trade Students, 4s.; Amateurs, 6s.; per session. Practical, 8.30 to 10. Fees—Trade Students, 7s. per session; 3s. 6d. half session. Amateurs, 10s. per session; 5s. half session.

*Advanced* (30 lessons) Thursdays—Lectures 7.30 to 8.30. Fees—Trade Students, 5s.; Amateurs, 7s. per session. Practical, 8.30 to 10. Fees—Trade Students, 10s. per session; 5s. half session. Amateurs, 12s. per session; 6s. half session.

A reduction of 1s. per class is made to Members.

The Advanced Course prepares students for the City and Guilds examinations.

The new regulations of the City and Guilds Institute require students to pass a local practical examination before admission to the written examination in the ordinary grade.

The Photographic Department contains a large studio fitted with Joel are lamp and reflector, for photographic work at night; two commodious dark rooms, lit with electric lanterns, and fitted up with every convenience for work. The equipment includes an 8½ × 8½ studio camera and lens, a 10 × 8 copying camera, fitted with Zeiss lens, an electric light enlarging apparatus with ten-inch condenser, a complete set of carbon and platinotype printing apparatus, and a special camera for lantern-slide making, so that ample provision exists for practical work. The classes are primarily intended for trade students, but others are admitted upon payment of higher fees.

Students will be provided with necessary chemicals and apparatus free of cost, but must provide their own plates, sensitive paper, &c.

Students who desire to gain a thoroughly sound knowledge of the science connected with photography are strongly advised to join a chemistry class, and to attend the lectures on light.

*SYLLABUS.—Elementary.*—Lectures on principles of photography; the camera and detached parts; the dark room and fittings; use of camera; plates; exposure; lenses; developers; defects; intensifiers; printing and toning; practical work in dark rooms and instruction in taking and copying with electric light.

*Advanced Lectures.*—The studio; portraiture; lighting the model by daylight and electric light.

*The Dark Room.*—Illumination of, and methods for testing safety of light.

*Negatives.*—Exposure of gelatine plates under every condition of light, subject, &c.; use of exposure tables, meters, &c.

*Development.*—Nature of development; the various substances in use and their relative advantages and disadvantages.

*Intensifying and Reducing.*—Both wholly and locally; the preparation of gelatine emulsions; composition of and defects in gelatine plates.

*Optics.*—The construction and use of photographic lenses; testing lenses; preparation and use of colour screens for isochromatic photography; use of shades and instantaneous shutters; testing speed of shutters.

*Cameras.*—Various forms and their use; camera stands; testing cameras.

*Landscapes.*—Choice of position; direction of light, &c.; use of view meters.

*Printing.*—Printing in silver, carbon, and platinum, including vignetting; printing in clouds, &c.

*Toning and Fixing.*—Theory and practice of, with formula for various solutions.

*Retouching and Spotting.*—Mounting prints; theory and practice of the wet-plate process, both negative and positive.

*Elementary Photographic Chemistry.*—Simple test for ordinary photographic chemicals.

*Enlarging.*—General principles involved, and calculations in enlarging or reducing to scale.

*Practical Classes.*—Instruction will be given in negative making, contact printing on bromide paper, silver and platinum printing, general studio work, and lantern-slide making; wet-collodion process; single and double-transfer carbon printing; Artigue printing.

## Our Editorial Table.

### "PRIMUS" PHOTOGRAPH CANDLE SHADE FOR PHOTOGRAPHS.

W. Butcher & Son, Blackheath.

The illustration shows the essential parts of this little frame, which can be fitted to any candle. It is made for holding paper prints, which are slipped in at the back and held by turning over the projecting pieces. Platinotype prints are found to give satisfactory effects, but thin bromide



and silver prints may also be used. No previous mounting is necessary, but it is recommended that the prints should be made rather darker than usual to give the most satisfactory result with transmitted light. The Primus Candle Shade is a neat and useful little item, and many an amateur photographer will, doubtless, appreciate it for decorative purposes.

### THE STEREO-GRAPHOSCOPE.

Agents: S. GUTTERMAN & Co., 35 and 36, Aldermanbury, E.C.

By suitable adjustment of the lenses this instrument can be used at will, either as a stereoscope, or a graphoscope for viewing single photographs. A hood fits the face, and the oculars are likewise hooded, anteriorly and posteriorly, and thus all extraneous light is excluded from the eyes. The directions for using the instrument are as follows:—

"Turn both metal lens holders so the stops on them strike the stops on the wood holder. The instrument is then set for stereoscopic views. To adjust for single photographs reverse both lens-holders until they



strike the stops, then remove the sliding picture bar entirely from the instrument, and hold the picture in the hand. Move up or down, toward or away from you to get the proper focus."

The instrument, which, as can be seen from the illustration, is on the well-known Holmes pattern, is beautifully made and finished, and the fittings are either in brass or nickel. It should be found exceedingly useful for the double purpose, but especially for binocular purposes. It is made in a variety of woods and styles.

MESSRS. GUTTERMAN have also submitted to us a number of samples of Texoderm. This is a substance designed for the manufacture of camera case covers. It is claimed to be waterproof, and stronger than leather. It is also said to be a better imitation of any leather yet produced, as the graining is an exact representation of the original leather, and, when mounted on the camera, cannot be told from the real article, either in smell, touch, or appearance. Texoderm seems admirably adapted for its special purpose.



## THE PROCESS YEAR BOOK FOR 1899.

Edited by W. GAMBLE. 108 pp., with numerous illustrations.

London: Penrose & Co., 8, Upper Baker-street, W.

FULL as usual from cover to cover with an amazing variety of photo-mechanical illustrations and articles appealing to the process man, this sumptuous annual once more makes a welcome appearance. When we say that there are eighty illustrations in monochrome and colour, most of them full-page, and nearly forty articles by competent writers, an idea will be gained of the scope of the book. Mr. Gamble is to be congratulated on this his latest volume. It puts before us, by the aid of its many superb pictures, a key to the present position of photo-mechanical work amongst reproduction processes, and, on that account, as well as for the valuable practical information it gives, it is certain to be highly valued by all those interested in process work. Needless to say that the "get-up" of *The Process Year Book* is faultless. Aside of its technical interest, and regarded solely as a production of the printer's press, it would make a most charming gift-book to any one interested in photographic pictures.

## THE "PRIMUS" LANTERNIST'S POCKET-BOOK.

W. Butcher & Son, Blackheath.

A COPY of this little pocket-book, which contains diary spaces and much information likely to be serviceable to lanternists, has been sent to us. Ten thousand copies of the book are distributed each season free of charge. Messrs. Butcher will forward a copy to any applicant on receipt of twopence to cover cost of postage.

## CATALOGUES RECEIVED.

Erdmann & Schanz, 116, Bedford-hill, Balham, S.W.

MESSRS. ERDMANN & SCHANZ's catalogue of fine-art photographs, which occupies forty-eight closely printed pages, has been drawn up for the reference of collectors, artists, and designers. Herein we find listed reproductions of mythological and classical subjects chosen from the world's principal art galleries; flower and fruit subjects; art studies from nature; Eastern types; Paris Salon pictures; German art; English art; Italian art; British gallery work; statuary subjects; secular subjects—in fact a unique series of world-famous pictures, reproduced in various photographic processes. The catalogue should be in the hands of all art-lovers.

## News and Notes.

MR. J. J. ELLIOTT, of Messrs. Elliott & Son, Barnet, shortly leaves England on a visit to the United States.

PHOTOGRAPHIC CLUB.—September 27, at eight o'clock. Demonstration of "The Wellington Film," by Mr. Harry Wade.

MR. J. C. HOSIER, of the County Studio, Bridgewater, has erected a first-class and well-appointed studio at Wellington, Somersetshire.

MESSRS. E. SANGER SHEPHERD & CO., have recently commenced business as scientific-instrument makers at 5, 5, and 6, Gray's Inn-passage, Red Lion-street, Holborn, W.C.

A CORRESPONDENT writes: "I was pleased to read your observations this week on the R. P. S., as some of our 'artistic' friends seem to think the universe was made for them."

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, Tuesday, September 26, at 5A, Pall Mall East, at eight o'clock. The apparatus on view at the Exhibition will be described by the exhibitors.

THE AUSTIN-EDWARDS MONTHLY FILM NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Mr. Henry Underhill, 20, Bardwell-road, Oxford, for his negative, *Children Skipping*.

AN amateur photographic society has just been formed in Harpenden, known as The Harpenden Amateur Photographic Society. The Hon. Secretary and Treasurer is Mr. Albert C. Salisbury, Limerick Hall, Harpenden, Herts.

THE session of the Photographic Class at the Aldenham Institute, Golden-crescent, Pancras-road, N.W., opens on Thursday, September 28, 1899. The teacher is Mr. Edmund A. Robias. Fees for complete course: Members of the Institute, 3s. 6d.; non-members, 5s.; apprentices under nineteen years of age, 2s. 6d. None but those engaged in the trade are eligible to attend these classes.

ACCORDING to Professor Trowbridge, of Columbia University, United States, a number of common things become phosphorescent at the low temperature of liquid air. Gum arabic appears a blue, ivory a bluish or greenish-white, cotton-wool a bluish-green, starch and paper a yellowish-green, white glue and celluloid a greenish-yellow, and kid glove a green. All these substances were put into filtered liquid air, exposed to an arc light, and examined in the dark. They continued bright for half a minute at least when kept at a low temperature after their excitation. Calcium tungstate, which is white in Röntgen rays, appeared green when submitted to the above treatment.

THE STEREOSCOPIC SOCIETY.—Owing to the death of a member, there is a vacancy in this Society, and any lady or gentleman wishing to join should apply to the Secretary for copy of rules, &c. The entrance fee is 1s. 6d., and the annual subscription is 2s. Since the Society was founded in 1893, it has circulated 1397 and divided 1360 stereograms amongst its members. Mr. Diveri, Huntly, Scotland, the Secretary, will be glad to entertain applications.

ACCORDING to the *Papier Zeitung*, where it is desired to avoid black specks in paper made in the smoke-laden atmosphere of a manufacturing district, the only effective remedy is the filtration of the air through a woven fabric of fine texture. At Schering's works, in Berlin, where photographic sensitised paper and plates are made, a circulation of air is maintained by drawing in air through cloth filters and expelling the same through powerful ventilators in the roof.

WARWICK MONTHLY COMPETITION.—The following is the list of awards of the Warwick Monthly Competition for August:—104. prize, Mr. W. H. Grimsdale, Ferry House, Twickenham, *Cows in Stream*; 51. prize, Mr. C. S. Tyler, High-street, Earls Colne, Essex, *Resting*; 11. prizes, Mr. E. R. Bull, 1, Bovill-terrace, Forest Hill, S.E., *Begging for Sugar*; Mr. H. J. Blane, 3, Cobourg-road, London, S.E., *The Road through the Woods*; Mr. B. Blaxland, 2, Willesden-park Houses, Willesden Green, N.W., *A Good Scrub*; Mrs. Cordiner, care of Mr. F. W. Cordiner, Cortes, Lomay, N.B., *A Model*; Mr. H. E. Davis, Camera Club, Charing Cross, W.C., *The Mill Bridge*; Miss Donaldson, 80, Wellesley-road, Croydon, *Evensong*; Mrs. Dickinson, 1, Milverton-terrace, Leamington, *Mixed Pickles*; Mrs. Gus Edwards, Allan House, Hereford, *An Anxious Moment*; Mr. F. W. Fielder, photographer, Foxenden, Dene-road, Guildford, *Child and Dog at Window*; Miss Hattersley, 391, Dickinson-road, Longsight, Manchester, *Winnie*; Mr. E. Hunt, Manley-road, Alexandra Park, Manchester, *Snap-shot at Woodhead*; Mr. J. G. Lawrence, 118, Petre-street, Sheffield, *Blackberrying*; Mr. J. D. Murray, Quarry-wood, Ore, Hastings, *The Seaweed Cart*; Mr. J. W. Oakley, photographer, Park Studio, Eastleigh, Hants, *The Little Man* (passenger on s.s. *California*); Mr. S. A. Pitcher, College Court, Gloucester, *North Triforium, Gloucester*; Mr. J. Palmer, 83, Upper Leeson-street, Belfast, *Carriek-a-ride Rope Bridge*; Mr. R. Perdue, P.O. Illican, Ireland, *Woman of Eighty-four Spinning Wool*; Mr. J. C. Warburg, 117, Gloucester-terrace, W., *The Edge of the Pond*; Mr. J. M. Whitehead, photographer, the Studio, Alva, N.B., *La Poupée*; Mr. E. C. Wyrall, Aldershot, *Wayside Gossip*.

THE Committee appointed by the American Chemical Society to consider the means by which the Society could hasten the adoption of uniform systems of graduation, definite limits of accuracy, and standard methods for using all forms of measuring instruments employed in chemical laboratories, have made the following recommendations:—1. That the American Chemical Society, in a manner consistent with its constitution and by-laws, ask the U.S. Office of Weights and Measures to adopt regulations for the verification of volumetric apparatus which shall be similar in purpose and scope to the regulations of the Kaiserliche Normal-Messungs-Kommission, after due consideration of the criticisms to which the latter have been subjected. 2. That the U.S. Office of Weights and Measures be asked to give special consideration to the question of a standard temperature or temperatures to be adopted for the graduation of volumetric apparatus, and to obtain, as far as practicable, an expression of opinion from American chemists on this point. 3. That the U.S. Office of Weights and Measures be asked to submit its regulations to the American Chemical Society, or a duly appointed committee thereof, for suggestions before final adoption by that Office. 4. That the international kilogramme be adopted as the standard mass. 5. That the litre as defined by the International Committee on Weights and Measures be adopted: viz., the volume of the mass of a kilogramme of pure water at the temperature of maximum density, and under a pressure of 760 mm. of mercury. 6. That all density determinations be referred to water at its maximum density and under a pressure of 760 mm. of mercury. 7. That all temperatures be expressed in terms of the hydrogen thermometer of the International Bureau of Weights and Measures. 8. That, if any question arise as to the interpretation of the above definitions, the decision and standards of the U.S. Office of Standard Weights and Measures shall be accepted by the Society as final.

## Patent News.

THE following applications for Patents were made between September 4 and September 9, 1899:—

PRINT-TRIMMING.—No. 17,792. "Improvements in and connected with a Revolving Print-trimming Apparatus, which may also be used as a Revolving Platform for Vignetting, Developing, and Toning Purposes, and for Window and Show-room Display Purposes; Box for Holding Prints, Paper, or other Articles, and a Retouching Desk." C. S. SOUTHIN.

DISHES.—No. 17,852. "Improvements in Dishes for Development and the like." P. V. LEVI.

PHOTO-REPRODUCTION.—No. 17,918. "Improvements relating to the Art of Photo-reproduction." J. T. BENTLEY.

KINETOSCOPE, &c.—No. 17,965. "A Combined Kinetoscope and Stereopticon." A. C. ROEUCK and F. McMILLAN.

CINEMATOGRAPH.—No. 17,995. "Improvements in Cinematograph Apparatus." J. MCCHEANE.

STANDARDISING ORTHOCHROMATIC PLATES.—No. 18,172. "Improved Means for Standardising Orthochromatic Plates and Testing Light Filters." J. W. T. CADETT.



## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
26.....	Birmingham Photo. Society	Exhibition of Negatives illustrating various Brands of Plates, produced by different Developers and Methods of Working.
26.....	Hackney .....	Exhibition of August Excursion Prints.
26.....	Leeds Photo. Society .....	The Camera and the Wheel. F. O. Bynoe.
26.....	Royal Photographic Society	The Apparatus on view at the Exhibition will be described by the Exhibitors.
27.....	Kingston-on-Thames .....	Excursion: Greenwich to London. Leader, J. F. East.
27.....	Photographic Club .....	Demonstration of the Wellington Film. Harry Wade.
27.....	West Surrey .....	Annual Meeting.
28.....	London and Provincial .....	Demonstration of the Tella Camera.
30.....	Hackney .....	Excursion: Whipps Cross. Leader, F. W. Gosling.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 14.—Mr. H. C. Rapson in the chair.

Mr. J. P. Mayall passed round a collection of photographs made by the developed printing-out paper process. Since January last, when he first showed results by his method of working, he had been proceeding with the process, and had succeeded, he thought, very well. The paper, in the present case, was Trapp's mauve printing-out paper, and the negatives, in some cases, by Bulbeck & Co.

The SECRETARY asked whether there was anything special about the glazing of the prints, which showed an extremely glossy surface.

Mr. MAYALL replied that they were only equegeed on to glass. Continuing, he thought there was a quality about the developed image that could not be attained by any printing-out method, and he hoped very soon to show the truth of this by comparing some direct prints with others by development. He had observed that this Association had from the first recognised the superiority of the developed image; but, as a rule, it appeared that prints so produced had always been offered with a kind of apology because they were by development. His own view was contrary to this, and the excellence of his prints, he maintained, was due to their being developed.

Mr. PHILIP EVERITT said the Germans were amongst the first to advocate the development of printing-out paper. Two years ago he paid Dr. Liesegang a visit at Düsseldorf, and was shown round the factory. At the time some prints of limelight apparatus and lanterns were being turned out for illustrative purposes, and he secured a couple, which he passed round. Dr. Liesegang had recommended various systems of development for different tones.

An exhibition of Convention slides by various contributors then followed. Mr. Dunmore, of the Tella Camera Company, showed a series by this instrument, all being taken at f/5, the largest aperture of the Cooke lens. There-with Gloucester, Tewkesbury, Tintern Abbey, &c. were represented amongst others of a miscellaneous character. Mr. Wilfred Emery showed some views, several of which attracted attention on account of their tones obtained by uranium. Mr. H. C. Rapson had some scenes in and around Gloucester, which were very well received. Some were gold-toned and others, which were cold in colour, were sulphur-toned. Mr. and Mrs. Welford lent some work, the latter some portrait studies, and Mr. Godfrey Bingley, of Leeds, very kindly sent up a score or so, including, beside the places named, Berkeley Castle, Frampton Court, Chepstow, &c. Most of his were of a pleasing, warm colour.

### PHOTOGRAPHIC CLUB.

SEPTEMBER 13.—Mr. R. Child Bayley in the chair.

Mr. E. W. FOXLEE said it would be remembered that, when two or three months ago he showed some photographs by Mr. Witcomb, of Buenos Ayres, a question arose as to the method adopted in producing one of them, in which the same figure appeared in five different positions. In the mean time he had written to Mr. Witcomb, who replied that the group in question was obtained by placing the figure in front of two mirrors placed at an angle of 45°. He sent a sketch showing the arrangement of the studio for this work. The photograph was made for purposes of advertisement, the subject being the Argentine Minister to Berlin. The mirrors were about seven feet six inches by five feet each, and some large screens, to cut off reflections of objects in the room, were also required.

The photograph, and some others on similar lines, were declared cleverly done.

### MANCHESTER PHOTOGRAPHIC SOCIETY.

SEPTEMBER 14.—Mr. F. Edwards in the chair.

Mr. HARRY WADE read a paper and gave a practical demonstration on the NEW WELLINGTON FILM

manufactured by Messrs. Wellington & Ward. The film, he intimated, is a departure from anything of its kind in photography, and will supersede the heavy and brittle glass plates of to-day. Unlike the present celluloid films, which are inflammable and difficult to develop, besides having the faults inseparable from having a celluloid basis, the Wellington film is made of the purest gelatine only, being supported during exposure and development upon a paper backing, which, after the usual manipulations of fixing and washing, is stripped away, and the resulting negative can then be printed from either side, thus conferring a great boon to the carbon or collotype worker, who need not now resort to the process of reversing his negatives. Mr. Wade then pro-

ceeded to develop a landscape negative, which showed beautiful gradation, and afterwards stripped several negatives, showing how simple this part of the process is.

Mr. H. M. WHITEFIELD, in a few remarks at the close of the demonstration, said that the new film had evidently a great future before it, as the results shown even rivalled glass negatives, and there was also an entire absence of halation.

Mr. WADE, on behalf of Messrs. Wellington & Ward, suitably responded to the vote of thanks, saying, in response to several questions, that the speed of the films was that of any good plate of extra-rapid emulsion, and that, unlike the celluloid film, it has excellent keeping qualities.

**Hackney Photographic Society.**—September 12, Mr. E. Puttock presiding. —In the course of the evening Mr. SMITH, of the Platinotype Company, gave a demonstration of

### THE PLATINOTYPE PROCESS,

in which he developed a number of prints on all varieties of the paper, and answered a number of questions, which were put by those present. Among many useful hints given were the following: The best method of developing the cold-bath paper was to float the same for thirty seconds on the surface of the developing solution. It was better to do this than to immerse the paper wholly, as it gave more brilliant results. The paper might also be developed by brushing the developer, diluted with glycerine, over the print, and this was perhaps the best method for large prints, as it allowed more control and economised the developer. Developing with glycerine, as also with plain diluted developer, tended to produce a warmer black than when developer of normal strength was used. The demonstrator did not advise the use of a saturated solution of oxalate, as it was liable to block the shadows. The use of flat negatives was not desirable, but these might sometimes be improved by using a weak developer, or by printing under blue glass. Hard negatives could sometimes be improved by printing under green glass, and very hard negatives under yellow glass. All brands of paper required printing to the same depth, although, on the rough-surfaced papers, the image might not show so plainly by reason of the surface roughness; still, in any case, the actinometer time would be the same. The sepia paper required to be developed with the hot bath at a temperature of from 140° to 170°, otherwise the treatment was practically the same as that required for the black deposit papers. It was very necessary, however, to guard against dampness, and it was rather more easy to over-print. The paper was also more sensitive to stray light, and must not be exposed to daylight until the prints had been placed in the fixing bath. Mealy prints on platinotype paper might be caused by the paper becoming damp before printing, the use of an inferior oxalate of potash, or the cold bath being below 60°.

**Redhill and District Camera Club.**—September 12.—Mr. WILLIAM ROWLINSON, of the *Survey Mirror*, gave a "chat" on

### PHOTOGRAPHS FOR THE PRESS.

Mr. Rowlinson said that he was frequently asked by amateur photographers, why photographs they had sent to magazines and newspapers did not always reproduce as well as they expected. The reason was not far to seek, as the photographs were generally platinotypes; and this process, by reason of its matt surface, did not always lend itself to reproduction in half-tone. Photographs intended for the Press should, to reproduce well, be from plucky negatives with plenty of contrast. Mr. Rowlinson then described the genesis of a magazine illustration, from the original sketch or photograph sent in by the contributor to the finished block. He then showed the "first proof," and described how faults in the picture, due to uneven pressure on the block, were remedied. Mr. Rowlinson illustrated his remarks with a large and most interesting series of pictures and blocks.

### 1899. FORTHCOMING EXHIBITIONS.

Sept. 22-Nov. 4 .....	Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.
" 25-Nov. 11.....	Royal Photographic Society. Hon. Secretary, Major-General Waterhouse, 66, Russell-square, W.C.
October 11 .....	Ludlow Photographic Society. Hon. Secretary, 14, Mill-street, Ludlow.
" 18-24 .....	Croydon Camera Club. Hon. Secretary, W. H. Rogers, 106, Holmesdale-road, South Norwood.
" 22-Nov. 19...	Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.
Nov. 27-Dec. 18 .....	American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.
December 7-9 .....	Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.
" 11-Jan. 1900 .....	Huddersfield (Invitation). W. A. Beevers, Cloth Hall-street, Huddersfield.
" 27-30 .....	Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.



## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### AMMONIA NITRATE OF SILVER.

To the Editors.

GENTLEMEN,—Your article on page 580 of your last issue, on "Ammonia Nitrate of Silver" recalls to me the fact that many chemists and silverers are not aware that a solution of ammonia nitrate of silver may be mixed with a solution of pure nitrate of silver without producing a precipitate of silver oxide, and this is the method I used to adopt to regulate the speed of emulsions. At one of the early Photographic Club meetings I mentioned this. I was immediately sat upon by several members (who shall be nameless), and whose chemical knowledge should not have induced them to exclaim "that it could not be done, and, if I did it, it would be chemical leger-de-main, and they would not believe it if they saw it." No free ammonia must be present in the ammonia nitrate solution. The easiest way to test this experiment is not to convert all the silver oxide, and after filtration mix the second portion. All the materials being pure, no second precipitate will ensue.

I need scarcely add I convinced the sceptics of their ignorance. I quite agree that paper sensitised with ammonia nitrate of silver does not keep so well as when sensitised in a plain solution of silver. Another thing, I have never been able to sensitise albumen paper on an ammonia nitrate silver. Coagulation does not take place rapidly enough to admit of the albumen remaining on the paper. True, it could be floated on plain silver first and subsequently on ammonia nitrate or on coagulated albumen. It may be remembered that I always advocated fuming the paper, and I have not changed my opinion. I remember a curious effect produced by using a small quantity of nitrate of uranium in the sensitising bath. In fuming the paper it got yellowish, but, after a day or two, it recovered its colour. I reiterate this that it may give a broad hint to plate-makers and paper-sensitisers. I believe uranium to have some wonderful photographic properties. A translation of "MM. Berthelot and Delépine's Investigations on Ammoniacal Salts of Silver" in your columns might interest your readers; at all events it will—Yours, &c., A. L. HENDERSON.

### VELOX AND KACHIN DEMONSTRATIONS.

To the Editors.

GENTLEMEN,—May we ask you to draw the attention of secretaries of photographic societies to the fact that we have made arrangements for giving demonstrations of Velox paper and Kachin developers, in all parts of the United Kingdom. Mr. W. J. Belton will be responsible for the North of England, Scotland, and Ireland; Mr. H. G. W. Claringbull, for the Midlands; and Mr. Donald A. Nightingale for London and the South Coast. Communications should be addressed to us at 20-26, Sardinia-street, Lincoln's Inn-fields, and, in order to prevent disappointment, must reach us some time during the present month. Thanking you in advance for making this announcement,—We are, yours, &c., JOHN J. GRIFFIN & SONS, Ltd.

20-26, Sardinia-st., Lincoln's Inn-fields, London, W.C., Sept. 19, 1899.

### PINHOLE CAMERAS.

To the Editors.

GENTLEMEN,—A good deal of attention is being given to the subject of pinhole photography just now. *Pearson's Magazine* recently published an interesting article on the subject. Would it not be worth the while of some of the manufacturers to put a good-class pinhole camera on the market? Such an instrument would be more than a toy.—I am, yours, &c., J. A. REID.

Kingcraig, Cutcliffe-grove, Bedford, September 19, 1899.

### THE METHODS OF OPTICIANS.

To the Editors.

GENTLEMEN,—I am very much obliged to Mr. Everitt for correcting the slips and misprints in the paper on Steinheil Lenses.

I should like to ask Mr. Everitt, who is so much better acquainted with the method of calculation actually pursued by opticians than I am

whether Sir W. B. Hamilton's work on the characteristic functions has had any very important influence on these methods? I may say that Hamilton's work (which included both optical and dynamical system, and was developed afterwards by Jacobi in his researches on differential equations) appeared before (1828-1836) Gauss's *Dioptrische Untersuchungen*. My own interest in such matters is chiefly mathematical, and, I am sure, of general interest if Mr. Everitt, or some other equally competent person, would give an account of the actual methods followed by opticians. It would be of great value as showing the special developments of the general theory, and also it might point out defects which could be remedied by study of the general theory (though I may be wrong in assuming that any optician fails to make himself perfectly acquainted with the general theory, where by perfectly acquainted I mean acquainted by study of the original).—I am, yours, &c., PHILIP E. B. JOURDAIN.

63, Chesterton-road, Cambridge, September 16, 1899.

### KODAK, LIMITED.

To the Editors.

GENTLEMEN,—I have to inform you that the Directors have declared an interim dividend on the Company's preference issue for the quarter ending September 30, 1899, at the rate of six per cent. per annum, and on the ordinary shares at the rate of ten per cent. per annum for the same period, which dividends will be payable on and after the 1st proximo.

They have further resolved that the transfer books be closed from the 20th to the 30th inst., both days inclusive.—I am, yours, &c.,

T. HALLET FRY, Assistant Secretary.

43, Clerkenwell-road London, E.C., September 19, 1899.

### AUROBA LANTERN-SLIDE CLUB.

To the Editors.

GENTLEMEN,—There will shortly be a few vacancies in the above Club, which is about to enter on its fourth year of existence, and I invite applications from good workers who would like to join us. The object of the Club is mutual help, criticism, and exchange of slides, and I think results have already proved its practical value. Being a Postal Club, the number of members is necessarily limited, and therefore I ask for early application, so that the list may be complete before arrangements for next round are made. Rules and full particulars from yours, &c.,

(REV.) F. PARTRIDGE, Hon. Sec.

St. Clothar Vicarage, Egloskerry, R.S.O., Cornwall.

### THE TANQUEREY PICTURES.

To the Editors.

GENTLEMEN,—Our delightful parish of Hawkhurst is now being favoured with a batch of circulars from Mons. Tanquerey, couched in the usual flattering terms, and accompanied by a list of testimonials and a special coupon. One of these offers was sent to me at my private address, and I had some thought of sending my portrait just to see what would happen, but this morning I have seen a sample of the work going through to the lady at the rectory of the next parish, and, under the circumstances, have decided not to make the experiment. This specimen is a roughly mounted bromide enlargement, about 15 x 12, finished by the air brush and a few strokes of a hair brush, presenting a soft, pleasing appearance, the little work done on the print being effective, and producing a soft, woolly, stippled effect, no doubt pleasingly flattering. The value of the work would be about 7s., and so as good as one could expect as a gift, but the one thing about it which deters me from trying my fortune is that the carriage of this precious work of art is no less than 6s. 3d. This will be slightly augmented by the time the carrier has delivered it, making a total of at least 6s. 6d. to pay for carriage. If this is the way the rector's lady is served, I wonder how less illustrious individuals are.—I am, yours, &c., E. WILLIAMS.

Highgate, Hawkhurst, September 18, 1899.

### CLOUDS.

To the Editors.

GENTLEMEN,—There is a printer's error in my letter on "clouds" which renders the meaning rather obscure. In the last line but one it reads thus: "With an ordinary plate shutter," which should be, "with an ordinary flap shutter," the difference being obvious.—I am, yours, &c., COLONEL.

Newport, September 16, 1899.



## Answers to Correspondents.

- \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.
- \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.
- \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

- A. Freke, 12, Duke-street, Cardiff.—Photograph of Park Hotel building, Cardiff.  
A. A. Cooke, 78, Somerset-road, High Cross, Tottenham, N.—Photograph of A. A. Cooke.

J. C.—We have written the firm. So far as we know, they are respectable.

REVERSED NEGATIVE.—W. PAGE. The reversal of the image, as regards right and left, is easily accounted for. The plate was put into the slide wrong side foremost.

IODISERS.—A. W. says: "Will you kindly give a few formulae for iodisers to adding to collodion when required for sale?"—Several formulae are given on pp. 1055-6 of the ALMANAC, all of which are good.

FOGGED BROMIDES.—SOUTH WALES asks the cause of the want of brilliancy and lack of whites in some contact bromide prints he sends.—The cause is that the paper is "light struck," that is, it has been exposed to light at some time or other.

LIGHTING SITTER.—S. COHEN. The portraits are by no means good. The fault in them is that they are lighted with an almost direct front light, which causes them to be flat and map-like. Stop off all direct front light, and illuminate the sitters by a front side light. There is also far too much top light.

PARAFFIN LIGHT IN STUDIO.—IMPRECUNIOUS asks "if it is possible to take good portraits at night by the light of six or eight good paraffin lamps?"—No, it would be impracticable. If you want to take portraits by artificial light, why not employ magnesium as a flashlight? It would not come expensive, and is very effective when rightly used.

EFFECT OF CARBON WORK ON THE HANDS.—R. W. writes: "Would you let me know if carbon work has been known to affect the hands, and, if so, what are the symptoms?"—Yes, but only after long and continual use. The first symptoms are a violent itching on, or between, the fingers, accompanied by minute watery pustules. These are the general symptoms.

STAMP PORTRAITS.—B. B. B. asks: "Can you tell me of any house that keeps the necessary appliances in stock for taking stamp portraits and perforating them. I am told that they are only made to order, and are not stocked by any one?"—They are stocked by most of the large houses, such as Maron's, Fallowfield's, and the like. If we mistake not, the latter named make rather a speciality of them.

BLACK SPOTTING MEDIUM, &c.—BLACKING says: "1. Can you tell me where I can get, or how I can make, a good jet-black, matt-spottling medium for finishing Velox prints and platinotypes? 2. Also the best thing to use for sticking P.O.P. prints in an album without buckling the leaves?—Ordinary water colours, say ivory black and indigo, to match the colour of the prints. 2. The best mountant for the purpose is a solution of gelatine containing a large proportion of alcohol. A formula for a mountant specially for the purpose is given on page 1061 of the ALMANAC.

RED LIGHT AND THE EYES.—OPERATOR says: "After I have been at work in the dark room, which is lit with a dark ruby light, for half an hour or so, and come into the studio, my eyes pain me very much. The strong light almost blinds me for a time, and my eyes pain me very much. Can you suggest any remedy, as I am afraid it may injure my sight?"—We should advise you to put on a pair of dark spectacles, known as "London smoke," before leaving the dark room. Possibly you are using an unnecessarily obscure light. Try deep orange in place of the ruby glass, and do not work too close to it.

PLATINUM TONING, &c.—T. KING says: "1. Will you kindly give me a good formula for platinum toning bath for gelatine chloride paper? please give it in a bath that will tone a sheet 24½ x 17 perfectly. 2. Would a Dallmeyer group and portrait lens give as good portraits as a Ross portrait lens? I want to use one if possible for the two purposes. 3. Will you please give me your candid opinion of the enclosed photograph?"—Chloro-platinite of potassium 10 grains; water, 20 ounces; nitric acid, 3 to 8 drops. 2. Yes, quite as well, but it will be slower in action. 3. The photograph is a very good one.

MIDGET PHOTOGRAPHS.—H. R. F. says: "1. I shall feel greatly obliged if you can inform me where I can get the material (sensitised cardboard or thick paper) for producing midget plates on as enclosed. 2. How is the name put on? it seems to me to be printed through a film placed in front of negative. 3. Who is the maker of frames for printing a dozen small bromides on one piece of paper from one negative?"—1. The print seems to be on ordinary bromide paper and mounted on the card, the margins of the negative being masked. 2. The name was probably on a thin film interposed between the negative and the paper. 3. Messrs. Seaman & Sons, Chesterfield.

RED IODIDE OF MERCURY.—T. S. M. W. says: "Will you kindly give the formula for making the red iodide of mercury of Mr. Watmough Webster, referred to in your article on 'Reduction and Intensification in Professional Work?'—Simply add a solution of iodide of potassium to one of bichloride of mercury, and the red iodide will precipitate. An excess of the iodide must be avoided or the precipitate will be redissolved.

SAL D'OR TONING BATH.—W. G. ORME. You could not have accurately followed instructions, but it is difficult to say where the error comes in. No precipitate of a reddish colour is formed in making sal d'or. Any such precipitate consists of reduced gold, and may result from (1) impure water; (2), dirty vessels; or (3), most probably pouring hypo solution into gold instead of vice versa. Excess of soda might be a contributory cause. Sal d'or is a colourless deliquescent salt.

MISTAKE IN MOUNTS.—PROVINCIAL says: "I ordered, through a small dealer here, who said he would get them from Germany, some mounts. Now that they are delivered, I find my name is wrongly spelt. The dealer declines all responsibility, and refers me to the firm in Germany from whom he ordered them, giving me their name. Who is responsible?"—The dealer from whom you ordered them. He must settle the matter with the manufacturers. Simply return the mounts to him, and refuse to pay for them.

BACKGROUNDS.—R. TROPFEN writes: "I want to make some sketchy backgrounds for vignettes and bust portraits. Can you tell me if sheets of white and brown paper are to be had as large as about five feet by four feet? If so, where they can be purchased?"—Yes. White and also brown paper can be had of any length, and of about five feet wide. The former is sold by artists' colourmen under the names of cartridge paper and cartoon paper. The brown is sold by upholsterers and large stationers under the name of carpet paper.

FACTORY ACT.—G. & R. ask: "We employ six persons (women) where we do our printing and mounting. An inspector has been to us and tells us we come under the Factories Act, and we must conform to its rules as regards hours of work, half-holidays, &c. Will you please say if photography does come within the Act, because it will make our work, with the shorter hours and the half-holidays, come much more costly; indeed we shall have to take on another hand, perhaps two, as the six we have now can hardly get through the work?"—Yes, your place does come under the Act, and you will have to abide by it, and, we expect, your employees will not be sorry for it.

SALARIES IN NEW YORK.—F. N. says: "Would you kindly inform me what is the usual salary paid to operators in New York City, first and second class, or a rough idea of same? And what is your opinion with regard to the qualifications necessary? Any information would greatly oblige."—In reply: We have no means of telling what salaries are paid in New York. Our correspondent's query may catch the eye of some American who can give the desired information. As to the qualifications necessary, we may, in general, say that, from what we can gather, a greater degree of smartness and ability is required by American photographers than is usually accepted by English employers.

MARKING ON FILM NEGATIVE.—E. G. R. says: "I shall be obliged if you will kindly tell me the cause of the circular yellow mark in the enclosed negative. The film is by Austin Edwards, medium speed; developer, pyro (with sulphite of soda) and carbonate of soda, with a trace of bromide of potash; fixing bath, one in five of plain hypo. The film was in the fixing bath quite a long time, say twenty or twenty-five minutes. I did not notice the mark till the film was dry after washing, of which it had an hour in running water."—The cause of the spot is imperfect fixation, through an air bubble being allowed to remain in contact with the film while in the fixing bath. You might try refixing the negative, but it is doubtful if the spot can be removed.

LANTERN SLIDES AND STEREO TRANSPARENCIES.—LANTERNIST says: "Would you please tell me: 1. How the tone of the enclosed slide may be obtained? It is a colour I admire, but I have never been able to produce the shade. 2. What film supplies a film which may be used to make stereoscopic transparencies with? 3. How might the back of a film be matted so as to do away with ground glass?"—1. The slide appears to be by the collodion process, but similar tones may be obtained on the ordinary lantern plates by a modification of the developer. Try some of the developers given on pp. 1033-1035 of the ALMANAC. With them almost any tone may be obtained. 2. Any of the films who supply films. 3. Any of the manufacturers of films will, doubtless, coat you some on celluloid with a matt surface on the reverse side. Celluloid with a matt surface is a regular article of commerce.

BLISTERS ON ALBUMEN PAPER.—A. BREXTON says: "Could you give me the reason and a cure for blisters on albumen paper? I use — & Sons' double, and take great care in all operations, &c., but get my prints absolutely covered with immense blisters, sometimes as large as a half-crown piece, besides thousands of what I call 'pimples.' I always make up the hypo hours before using, so it cannot be change in temperature of the baths. These blisters only appear in the washing water immediately after leaving the hypo. It is really the greatest trouble I get in all my work, as it is so difficult to wash prints, as they all float on account of the air enclosed?"—In reply: Some papers are more prone to blisters than others, particularly the double albumenised. The best way we know of preventing the blisters is to immerse the prints, dry in methylated spirits for a minute or two before commencing to wash out the free nitrate of silver, then proceed in the usual way. The following method will often obviate blistering. When the prints are fixed dilute the hyposulphite solution with an equal part of water and let them remain in that for a few minutes, then dilute further, before putting the pictures into the washing water.



# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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## THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1900.

Edited by THOMAS BEDDING, F.R.P.S.

THE thirty-ninth annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1 next. Its preparation is already receiving attention. This year's ALMANAC reached a total of 1508 pages, and the entire edition of 20,500 copies was sold out within about three months of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past ALMANACS have been received is the surest proof that the lines upon which that publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1900. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the ALMANAC in directions which may occur to our readers as susceptible of improvement.

The ALMANAC for 1900 will appeal to photographers all the world over as a daily reference guide in practical work. The

formulae will be revised where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages of the 1900 ALMANAC. Those of our friends intending to co-operate with us in this respect will oblige us by letting us have their MS., sketches, &c., at the earliest possible date.

Secretaries of societies will also oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us as early as possible.

The publishers ask us to remind advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

## EX CATHEDRÀ.

THE correspondent of a contemporary echoes a recently expressed regret that, comparatively, so few people devote themselves to the pursuit of the knowledge that after all is surely the only subject worthy of the attention of mankind. "Politics, trade, law, letters, and the like, engross the attention of nine-tenths of us, and the recruits for science are few and far between. Is it not time something were done to alter this, and to train up the coming generations in the service of science, that the abundant promise of the last hundred years may bear fruit a hundredfold during the coming century? I feel sure," he adds, "that there are thousands of fathers who will feel as I do, and I venture therefore to ask for a little information. A middle-class man with a fairly large family of boys, most of whom have done fairly well—generally after wriggling their round selves out of the square holes into which I had fitted them—I want to know how I could start the youngest, a boy of sixteen, of average intelligence, but no



special bent, and educated at one of our second-rate public schools, in some career in which he might work for science and—earn a modest living? It is possible that some of your readers who have been through the mill may give hints. They would, I feel sure, be welcomed by many well-meaning parents. I am not pleading for facilities for the embryo giants of science. Their abilities will find recognition and encouragement, like those of Faraday and many others have done in the past. I only ask, in the first place, how it is possible to start average lads in the pursuit of some branch of scientific work which shall yield bread and cheese and the prospect of really benefiting their fellows instead of robbing them." May we suggest to this gentleman that some of the higher branches of photographic work might satisfy his laudable anxiety on behalf of his son?

\* \* \*

We join with the *Daily Chronicle* in protesting against the public exhibition, by stereoscopic and other means, of improper photographs which many persons are exploiting in some parts of the country. Throughout London and seaside towns just now, points out our contemporary, there is a craze for the exhibition of photographic reproductions of pictures by various mechanical devices. "We do not refer to exhibitions in the parks such as have come under the notice of the police, but to more pretentious penny shows open to the young, to which we would also direct the attention of the police. It has been brought to our notice that many of the pictures exhibited are suggestive, and that some are grossly indecent. The police seize 'Continental works of art' in shops where few people see them; why permit equally objectionable shows open to the multitude?" We trust the authorities will exercise every vigilance in this important matter. So far as the world of photography is concerned, there is comfort in the reflection that these degrading exhibitions do not owe their origin to legitimate photographic enterprise; but we, nevertheless, hope that photographers will be the first to discountenance this prostitution of the camera to such ignoble ends.

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THE Vienna correspondent of the same journal gives an interesting account of the degree of confidence which Her Majesty the Queen reposes in Professor Angeli, Her Majesty's favourite painter, who has recently been intrusted with the execution of a portrait of the Queen. It appears that for the last twenty years the Queen has had her portraits painted exclusively by Professor Angeli, a fact which has caused jealousy to many an English and foreign artist. Professor Angeli, in the course of an interview, said: "The Queen would not sit to anybody else for five minutes. To me, however, she sits for hours whenever I like. Her Majesty has got accustomed to me; to be constantly looked at by another man would greatly annoy her." While sitting to Professor Angeli, letters, telegrams, and even State documents are read to the Queen by Princess Beatrice. Professor Angeli enjoys Her Majesty's highest confidence. No secret (he says) is hidden from him. The last time the Queen was sitting to him at Windsor Castle, on the occasion of her eightieth birthday, she wished to be taken simply as a woman, not as the Queen. This portrait, at Her Majesty's desire, is to be reproduced for circulation amongst the English people. The Queen, however, will not allow the original portrait to be used for reproduction, so Professor Angeli will make a copy of it.

We do not know whether any of those photographers whom Her Majesty honours by sitting to them for her portrait possess anything like the exceptional privileges which Professor Angeli appears to enjoy; but, at any rate, we take it that their sittings frequently occupy more than five minutes, although the Professor appears to think that Her Majesty will not sit to anybody else for that length of time. At any rate, Professor Angeli may be sincerely envied for the very great favour which he alone, of all the world's artists, appears to enjoy at the hands of the Queen-Emress. Commenting on the interview, the *Chronicle* says: "What a pity that Her Majesty did not choose an English, or a Scotch, or an American artist, and get accustomed to him! Millais would not have looked at her more than was necessary, and, as a painter, he was worth a dozen Angelis. Mr. Sargeant would have been a model of discretion, and would have painted a portrait with tremendous force." Perhaps, however, Professor Angeli was not so indiscreet as the interviewer makes him appear to be.

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THE theatre of the Society of Arts has for years past been the scene of a great many meetings and lectures of direct interest to photographers. Such men as Abney, Warnerke, Bolas, Dallmeyer, Ives, Traill Taylor, Lippmann, Beek, and many others have figured amongst those who have addressed audiences there on subjects of the highest importance in theoretical and practical photography, and at times the Royal Photographic Society and the Camera Club have had the free use of the lecture-room for their meetings. There is no doubt that, in this and other ways—particularly by the devotion of some of the celebrated Cantor lectures to photographic subjects—the Society of Arts has rendered very material assistance to the cause of photographic progress, a work in which it has had the immediate sympathies of the Secretary of the Society, Sir Henry Trueman Wood, whose services to photography have been many and various, as our readers are aware.

\* \* \*

THESE remarks are suggested by the circumstance that, in the last number of the *Journal of the Society of Arts*, a brief history of the Society between the years 1754 and 1899 is given. We have set before us a modest estimate of the very great beneficial influence which the Society has always exercised on the arts and sciences. We learn that it is one of the three oldest of the learned and scientific societies in the country. In the department of fine arts, we are told, it had a share in assisting the education and encouraging the youthful efforts of many of the most eminent artists from the time of Reynolds to our own days. On its prize-lists are found the names of Richard Cosway, Joseph Nollekens, George Romney, Sir Thomas Lawrence, P.R.A., Sir William Ross, William Mulready, Thomas Bewick, Aloys Senefelder (the inventor of lithography), John Flaxman, W. Wyon (the medallist), Sir Edwin Landseer, Sir Charles Eastlake, P.R.A., W. P. Frith, J. C. Hook, Sir J. E. Millais, P.R.A. One of the first, if not the first, public exhibitions of pictures in London was that held in 1760 at the Society's rooms in the Strand, near Beaufort-buildings, an Exhibition which really led to the foundation of the Royal Academy in 1768.

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THE history continues: "The great improvement in decorative art which has marked the last half of the present century in this country may be said to have had its birth in the Society



of Arts. Chiefly owing to the strenuous efforts of the late Sir Henry Cole, the Society originated a campaign against the ugliness and ignorance in artistic matters which was certainly prevalent in England about the end of the first half of the century. Its efforts were for a long time met with ridicule, but public opinion was gradually converted, and the value of beautiful and artistic surroundings in daily life, instead of being a matter to be sneered and laughed at, is now regarded as a matter of course. Moreover, the Society took an active part in the improvement of the Patent Law, since the first improvements in 1852 down to the last Patent Act of 1883. It was the action of the Society that first secured protection for copyright in works of art. Its Food Committee was one of the earliest agencies to draw attention to the necessity of providing means by which meat and other foreign food products could be successfully imported. One of its committees for a long time urged on the Post Office the necessity for a Parcel Post (suggested in 1858), and worked up public opinion until it was granted." This little history of the Society—it was to the Society of Arts, by the way, that the idea of the 1851 Exhibition was due—should be read by all those concerned in tracing the causes that have influenced artistic and scientific progress during this century. Assuredly, as we have before remarked, photography owes not a little to the encouraging recognitions which it has so long received at the hands of the Society, Sir Henry Wood, and his predecessor in office, the late Mr. P. le Neve Foster.

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MESSRS. CADETT & NEALL, of Ashted, ask us to notify that they have now made arrangements that, in the future, dealers will be able to secure smaller quantities of carriage-paid goods of their manufacture than in the past, by which they anticipate they will not receive complaints of difficulty in obtaining their various brands in certain parts of the country. This concession will be to the advantage of distributor and user, inasmuch as plates and paper can now be bought in such quantities as to be a guarantee that "Cadett" brands are of the freshest manufacture.

#### PERMANENCE OF THE BROMIDE PROCESS.—II.

REVERTING to the subject of the permanence of bromide pictures—and we might add also gelatine prints generally—we shall here refer more fully than in the previous article to the means by which the changes that have taken place in pictures by this process might have been avoided. These must not, however, as is too often the case, be charged to the *carelessness* of the workers, but, rather, to the work being put into the hands of assistants who are utterly ignorant of the principles upon which either fugitiveness or stability depends. This remark not only applies to assistants but to many who are now making enlargements at a cheap rate for the trade and others. In many cases their knowledge of photography is entirely mechanical; they have no theoretical knowledge whatever of the process by which they produce their work—often good to look at, though it may contain the seeds of its decay. Under these circumstances it is not surprising that one sees so many gelatine pictures, both enlargements and direct prints, that have undergone a marked change, though not faded, within a comparatively short time. We again emphasise this matter because it has been, and is, bringing discredit on a valuable process which it does not deserve.

In the former article we alluded specially to pictures developed with the ferrous oxalate, being—indeed generally—put into the fixing bath while they still contained a considerable amount of free acid, and how that was one of the frequent causes of a speedy change. The remedy in this case is obvious—elimination of the last trace of acid before the picture is introduced into the hyposulphite solution. This is not altogether the easy matter that might be surmised. Let any one after developing, say, an enlargement, and giving it the usual amount of washing—nay, an extra amount—drain it pretty closely and then press a slip of blue litmus paper on its surface and see the result. This will show, in the majority of cases, when the ferrous-oxalate developer is used, that the pictures go into the fixing bath while they are in a decidedly acid condition, and, as a consequence, the hypo is decomposed in the gelatine film, and in the paper supporting it, setting free sulphur and sulphur compounds which may well be expected, eventually, to act mischievously.

It may be urged, by those who produce bromide enlargements at an exceedingly cheap rate, that it would not pay to so thoroughly wash each individual picture so that no acid remains when it is put into the hypo, but with that we have nothing to do, that is their business and not ours, we simply point out the conditions. There is, however, no necessity now to use the acid iron developer and the subsequent acid bath at all, as several of the new developers will answer the purpose quite as well and yield quite as good colours. They would, of course, obviate this source of uncertainty.

There is, however, another very prolific source of the discolouration of bromide pictures—and here chloride ones must also be included—namely, imperfect fixation. In the previous article (see p. 564) we alluded to the reactions that take place in the fixing bath, and pointed out the necessity of perfect fixation in order to get the hypo compounds into a perfectly soluble condition so as to be capable of elimination by washing.

Now, how are these conditions fulfilled—or rather not fulfilled—in a great majority of cases? We are now referring to chloride prints as well as bromide ones, as precisely the same state of things obtain. The formulæ generally given for the fixing bath, for both bromide and chloride pictures, is weaker than used to be employed for albumen prints, and the time of immersion also less. Hence it will be seen that gelatine pictures do not, as a rule, get the same degree of fixation that those by the older process did; whereas, with the thicker film, they ought to have more rather than less. Furthermore, far more pictures are generally fixed in a given quantity of solution than used to be the case with albumen prints, and, as a consequence, the hypo-silver compounds are not got into the necessary soluble state to ensure their complete removal in the after-washing, however prolonged that may be. In some instances prints still contain salts that are sensitive to light, as witness the actual darkening of many pictures by a prolonged exposure to light.

We recently saw in a London suburb, where photographs of local scenery are sold, a dozen or two of prints on gelatino-chloride paper, framed and hanging outside a shop, that were in a woful plight. In some the skies and lights had become of a deep yellow colour, in others they had become a purple brown, and the prints much darker generally than they were at first, and many of the pictures clearly showed that light-sensitive salts were still in the film and in the paper, *i.e.*, the action of the hypo had not been complete. No amount of



washing, had the prints been subjected to it, would, in such a case as this, have prevented the discolouration with long exposure to light.

As we have said before, with perfect fixation a comparatively short washing will suffice, but without that no amount of washing will confer stability. Therefore hypo should be lavishly used (and it is cheap enough now) and plenty of time given for its action; and as an extra precaution the prints, after being fixed, should be immersed in a fresh solution of hypo for five or ten minutes before they are washed. This applies alike to bromide enlargements and prints on P.O.P., when the greatest stability is required.

It will probably be said by some that all this involves extra trouble and increased expense, but with that, as we have above intimated, we have nothing to do. Our object is merely to point out how the greatest degree of permanence is to be secured in gelatine pictures, and nothing more.

#### THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE Forty-fourth Annual Exhibition of the Royal Photographic Society, and the last to be held in the Gallery of the Society of Painters in Water Colours, at 5A, Pall Mall East, was preceded on Saturday last by the usual Private View and *Conversazione*. At the latter function, in the evening, the place of the President (Lord Crawford) who is unfortunately suffering from severe illness (from which we are sure all our readers will wish him the speediest possible recovery) was taken by Major General Waterhouse, who with the Council received the members and guests. The unfavourable weather was, doubtless, the cause of a smaller attendance than usual; nevertheless, the gathering was large and representative, and if the time-honoured difficulty of studying the exhibits was felt quite as fully as hitherto there was the compensating consolation of ample opportunity for those pleasant little exchanges of friendly greetings; the meeting of acquaintances parted, perhaps by the span of a twelvemonth, and a comparison of notes on things in general and photographic matters in particular, which invariably and agreeably characterise R.P.S. *Conversazioni*.

It was a positive relief to escape from the interested nonsense and puerilities that were recently uttered in certain quarters anticipatory of the Exhibition, and get to an inspection of the display itself. So far as we could discover—and we are not deficient in opportunities for gauging the opinions of those most concerned—nobody whose views count for anything at all in the matter cared two straws about the momentous injustice of not permitting the Judges to co-operate in the work of selection. The fuss that has been made over this trifling affair finds its inevitable sequel in a chorus of approval of the way in which the selecting and hanging has been done. A member of the Selecting Committee remarked to us, on Saturday evening, that possibly on reconsideration some few of the photographs on the walls might have been excluded; but amongst the hundreds that were rejected in all probability there was even a smaller number that might have been included in the Exhibition. We doubt if this satisfactory state of affairs could be bettered by calling in the assistance of those heaven-born Judges who have whimpered at their exclusion from the Selecting Committee.

The dominant characteristics of the present Exhibition may be hit off in half-a-dozen lines. As we prognosticated a few weeks ago, nothing startling is on view. The lantern slides and other transparencies show a falling off in numbers and quality. Novelty is not perceptible in the Technical Section, and practically the whole of the apparatus exhibits has been before the photographic world for months past. Coming to the Pictorial Section, we discern less of the imitative mud-flat element than hitherto—a welcome revolt, by the way—and the portraiture is distinctly better and brighter than last year. In architecture, improvement is conspicuous, while in some of the figure studies there is a *verve* and decision of effect which we have not seen equalled for years past at this Exhibition. On the whole, we should say that, regarded from the strictly photographic point of view, the Exhibition is a shade the better of its immediate predecessor. The work of the lens, the camera, and the dry plate is more strongly in evidence than the efforts of the photo-faker and the misguided people who have hitherto confused nebulousity and sombreness of result with pictorial photographic effect. At Pall Mall just now,

in short, we have a collection of photographs which, with few exceptions, do not leave the spectator in doubt as to what they are meant to be, or by what methods they have been produced.

The Judges this year were Mr. Horsley Hinton, Mr. Harold Baker, Colonel Gale, Mr. W. L. Wyllie, A.B.A., and Mr. B. W. Leader, R.A. They awarded ten medals as follows:—

21. <i>Head of an Old Man</i> .....	Dudley Hoyt.
130. <i>Summer Shades</i> .....	J. H. Gash.
139. <i>The Miller's Workshop</i> .....	W. T. Greatbach.
191. <i>After Rain</i> .....	C. F. Inston.
217. <i>In Wirksworth Church</i> .....	W. R. Bland.
278. <i>Sunny Pastures</i> .....	E. G. Boon.
276. <i>Roses</i> .....	J. M. Whitehead.
299. <i>Vignette in two Colours</i> .....	A. Stieglitz.
333. <i>Absorption (copy of etching)</i> .....	J. H. Player.
388. <i>Engraved Screen Plate (200 lines to inch)</i> .....	J. E. Johnson.

All but Mr. Stieglitz and Mr. Inston take a Pall Mall medal for the first time. Already there has been some discussion over the judging, and the opinion has been very freely expressed to us that, with an alteration of the personnel of the photographic members of the jury, the destinations of at least three, if not five, of the medals would be changed. It is best to speak plainly in matters of this sort, and we say at once that there is considerable room for discontent with this year's judging.

One extraordinarily remarkable coincidence has to be noted. Last year medals went to Mr. W. J. Warren (Leeds Camera Club), Mr. C. S. Baynton (Birmingham Photographic Society), and Mr. G. E. Thompson (Liverpool); this year medals go to Mr. J. H. Gash (Leeds Camera Club), Mr. W. T. Greatbach (Birmingham Photographic Society), and Mr. C. F. Inston (Liverpool). We feel obliged to say that the coincidence is all the more noteworthy inasmuch as quite as good work as these gentlemen show comes from other, if less "pictorial," parts of Britain. Nevertheless, we heartily congratulate the medal-winners on their success, and wish them many more triumphs at Pall Mall and elsewhere.

The standard of work in the exhibition is exceedingly high—there are but few false notes among the whole number of pictorial exhibits—and there are nearly 370 of them, a fact that speaks volumes for the exhibitors' artistic progress and the Society's care of selection.

"Schools" are becoming less the fashion, and individual work once more pushes its claims to public recognition, and with evident success.

Let us look at some of the work—we cannot take it picture by picture, for space will not permit, but we will note a few of the things that struck us as being worthy of comment; and, as in our notes on the Salon, we will try and take the exhibits of the workers as their names appear in the catalogue.

First comes Mr. W. J. Croall. We are sorry to see only two examples from this talented gentleman; one appears in the catalogue as a reproduction of his picture of a sporting dog which he calls *Steady*, and the other is a glorified Convention snap-shot of some sheep under a tree with the appropriate title of *Mid-day Rest* (No. 10). The grouping of the sheep is excellent, but they have been "lost" somewhat in the process of enlargement.

No. 4, *Spring Pastoral*, the work of Mr. A. Cochrane, is a more ambitious effort and is also beautifully reproduced in the catalogue.

Every effort has been made to bring the picture together into one harmonious whole, evident pains have been taken to subdue an obtrusive light or to soften an over-heavy shadow, and the result is very beautiful; the only thing that particularly impresses itself upon us is the great contrast made by the very light sheep and the very dark background, this has the effect of making the subject look somewhat "scattered," and a wee bit of toning down in the high lights on the before-mentioned animals would be a considerable improvement, and with the light behind the trees would the sheep not cast shadows?

Nos. 5 and 152 are also the work of this gentleman, but the first is the most worthy of careful study.

Mr. Greatbach sends seven examples—all of them careful works, and several most artistically treated, notably No. 97, *A Woodland Path*, which somewhat resembles Mr. Percy Lund's picture last year. No. 122,

*The marsh is frozen,*

*The river dead,*

is very fine—almost like a silver print drawing, and his medal picture, No. 139, *The Miller's Workshop*, was a wonderful triumph of both artistic and technical skill; quite free from halation, perfect in tone, a simple subject has been made worthy of the coveted award by a combination of the principles of both science and art. The slightly open door sounds the key-note of the composition—take this away and the picture



would become flat. No. 250, *The Mill Stream*, is somewhat lifeless, and is not so good, though beautifully composed. No. 279, *A Summer's Day*, is a charming little landscape, but the shadows are rather heavy.

Mr. W. J. Warren has several well-executed examples; the first, No. 7, reminds us somewhat of Mr. Hinton's picture in the Salon last year, though the treatment is altogether different and strikes us as being somewhat too heavy. No. 105, *At Concarneau*, is full of life and movement; it is a busy scene amid market boats. No. 232, *The Ambulatory Tewkesbury*, is a fine architectural bit, and No. 248, *A Sunny Glade*, particularly appeals to the admirer of detailed riverscape scenery, but *The Terrace at Haldon*, No. 137, is our favourite. Mr. Ralph R. Rawkins has a nice little landscape in No. 8, *A Dorset Meadow*, and No. 220, *Watching the Sunset*, is a picturesque little cottage scene much in the style of Peter Ghent (Liverpoolians well know this artist's work, and whose masterpiece was purchased for the permanent collection at one of their galleries).

The work of Mr. Charles Job deserves special attention. The first (No. 9) is reproduced, and is an artistic rendering of a difficult subject. The old buildings are not as picturesque as they might be, and there is a feeling, as you look at the picture, as if it had something lopped off somewhere. This is due to the tall masts of the boats being seen without the hulls, and we are not sure if the omission of the two principal masts would not improve the effect greatly. No. 67, *Repairing the Harness*, is a delicate bit of work, but we like No. 165 for vigorous treatment.

The head and figure studies this year are again excellent, and it is almost invidious to make distinctions; but Mr. Speight, Mr. Ralph Robinson, Mr. Warneke, Mr. Dudley Hoyt, and Mr. Sidney Underdown, Mr. William Gill, and Mr. Alfred Werner, are all household names, and one naturally looks for something above the average from such gentlemen, and this year we are not disappointed.

The medal given to Mr. Dudley Hoyt (An American, by the way) was supported by universal public opinion, his *Head of an Old Man* (No. 21) being the portrait of the year at the "Royal." Unfortunately, this is the only exhibit from our American cousin. Mr. Ralph Robinson fulfils all that is expected of him, which is saying a great deal. Mr. Warneke's work was also much admired, but Mr. Harold Baker did not send much this year for us to admire, and he seems rather bitten by the architectural craze. There are others whose work we may have occasion to note as we proceed round the gallery.

Mr. Page Croft, versatile as ever, sends in nine exhibits varying from portraiture to landscape, *An Idle Apprentice* (No. 26), a portrait of *Herman Vezin, Esq.* (No. 27), *The Toilet* (No. 49), obviously inspired by Etty. *On Guard* (No. 63) *December* (No. 175)—This is more a "Salon" subject, brown, and sombre, and subdued, like Nos. 231 and 278.

There is a lot of feeling and sentiment in Mr. R. S. Webster's picture of *Sir G. Reid* (No. 33), and No. 40 by Mr. A. Knyvet Gordon might be entitled *My Mother made me Braid my Hair*. Mr. William Balston's *Effie* is a bit of rare technical work, and Mr. F. H. Evans's portrait of *Mr. Storey* (No. 55) is also good. Mr. Ernest G. Boon sends many exhibits (13). No. 240, *Alasians Beaching a Boat*; and No. 310, *Shipping, Genoa*, struck us as being particularly good work. His medal picture, *Sunny Pastures* (No. 273), was the subject of much comment, the more advanced section praising it and the moderatists denouncing the award; and, whilst admiring the work, we cannot say it appeals to our inner sentiments like some others that we could mention.

Mr. Francis A. Bolton sends three pictures. No. 58 is a headland, with clouds and nice foreground, but wanting in interest; No. 117 is rather a misty tree study, and No. 229, *November in the Woods*, requires no description.

Dr. Llewellyn Morgan's exhibits are mostly inspired, we should surmise, by the beauties of his native country, with the exception of his *Font at York Minster* (No. 168), which is a fine bit of work. His *Falls in Sunshine* (No. 178) is the most artistic treatment of a waterfall we have ever seen. Usually waterfalls are ugly, and white, and stiff, but here the doctor has interposed foliage and rocks, and so manipulated his light and shade as to give us a beautiful picture. His other cottage subjects are very Welsh, and are startlingly like some of the studies of the artist we referred to before (Peter Ghent) at his best.

There are one or two pictures of the Paul Martin night school. No. 60 is one of them, but the chief exponent is Mr. W. A. Fraser, and six pounds seems a lot of money for No. 142, except it were paid by the proprietors of the paper whose circulation is announced in letters of fire, the eyecore of the picture. They are, no doubt, all very clever, particularly the one (No. 206) entitled *A Winter's Night*, where the mystic light falls on the snow mounds, giving the scene a weird effect. Yet we would like to see Mr. Fraser turn his talent in other directions.

Now we notice the picture by Mr. Alexander Keighley (No. 60). The tone of rich sepia suits the subject well, the sky is simply perfection, and the value of it enhanced by the deep tones of the landscape beneath. The composition is somewhat diagonal—a long and almost unbroken road leads to a distant mill; all this is in deep shadow, and the sky benefits thereby. No. 155, *Cow Parsnips*, is another but entirely different piece of work, being a very excellent study of this pretty feathery summer weed. All the surroundings are darkened, and kept under to give value to this useful foreground study. No. 228 is Mr. Keighley's greatest effort. The title, *My Lady's Garden*, raises our hopes. We associate it with all that is sweet, and dreamy, and lovely in form and colour, and we have no doubt Mr. Keighley's poetic temperament fired his ambition to emulate the glories of Marcus Stone, and surpass him in photographic excellence. The effort is great, but we should like to ask Mr. Keighley what has scratched the peacock's back, and what those sunflowers have done to grow such strange marks on their flowers and stems, and who cracked and tried to mend the stonework?

For those who will not see this picture, we will try and describe it.

It is an old garden, with lofty trees towering high above the gravel walks on the left, and beneath their shadow an ancient sun-dial covered with lichens, the signs of age and decay, and near by a peacock, which gazes across the path with glowing admiration at my lady, who is attired in a gown of the Empire period. (Forgive us, Mr. Keighley, if we are mistaken in the period; but it looks like it, and fits the scene, as well as the wearer, to a T.)

The lady is tall and stately, and is gathering from an Old English flower-bed some of the blossoms, whilst hard by tall sunflowers rival her in height and beauty. The tall and distant hedges are relieved here and there by graceful foliage and a quaint old bit of stonework. The whole is treated in a rich brown sepia; the idea and *motif* our readers may judge for themselves, though the execution may not be all that is desired. Mr. Keighley, try again. You have got a magnificent groundwork; trust to photography, and let the pencil and brush treat it in colour on the canvas, but not on the print. It was a scene such as this that earned for Andriotti his first fame as a painter.

No. 65, *The Common Lot of Mortals*, is a well-taken but gruesome subject, an interior with figures, and on the bed in the corner lies a woman dying. No. 350 is a portrait by the same master; Mr. T. C. Turner, and is in a much happier, if more ordinary, style, and equal in technique to his other work.

Mr. John Bushby has several pleasing subjects. No. 75 is one; No. 109, *From the Desert*, another; and No. 140 a third.

Mr. J. A. Hodges has a lovely composition in No. 76, *A Scottish Loch*, but this is his only exhibit.

Now we reach Mr. Hinton's first picture, No. 78, *Oyster Beds, West Mirsea*. Essentially a cloud study, everything is subdued to force the sky, which is quite beautiful enough to take the burden of attention upon itself. This is rather a favourite treatment of Mr. Hinton's, and his little book on *Practical Pictorial Photography* gives a similar scene, and shows how it is done.

No. 113, which has been called *Sun Breezes*, is spoilt by a light cloud, which catches the eye and misses an otherwise beautiful and characteristic subject, which is in the best style of the worker.

No. 193, *Silent Gladness*, is disproportionate—artificial and palpably sunned down; the tangled undergrowth is quite overweighted by the heavy trees above, and the whole has an unreal look about it that is not convincing, either photographically or artistically.

No. 89, by Mr. C. C. Branch, is a gloriously lighted subject, as one might expect in the land of camels and drawers of water.

Mr. W. D. Welford also sends a study in lighting; his idea is good. In his mill scene (No. 93) he surrounds with light the dark mill and foreground. The only practical methods of gaining the maximum effect with the minimum of labour are those with which Turner startled his contemporary by putting a dark castle bang against the light, and right in the centre of the picture (Cellar, National Gallery). Mr. Welford's other picture (No. 101), *Telford Bridge*, is also a nice composition, but neither of them is as ambitious as we should expect from this past grand master of photography.

Mr. Percy S. Lankester sends in another of his halated-tree-trunk-reflection-in-the-pool studies, for which we have no sympathy; we want to see something better from you, Mr. Lankester—you can do it; let it be done.

The works of Bolas should be above criticism; two of them are, but the third, which is illustrated in the catalogue, No. 201, is harsh, and white, and square, and ugly, and why it has been put amongst the reproductions we know not.



The architectural subjects are throughout very fine, and, we will take em collectively rather than individually, as near perfection as photographic process can make them, Mr. Gash's work, that of Mr. H. W. Bennett and Mr. C. J. Fowler being particularly admired, to say nothing of the prize print of *Wirksworth Church* by Mr. Bland. By the way, Mr. Bland, are not sunbeams penetrating through a stained-glass window, as at *Wirksworth*, always parallel?

Miss Lovibond's delicate little studies, too, were greatly liked, and Mr. J. H. Avery's *Entrance to the West Door, Lichfield*, was the subject of universal comment.

Mr. John H. Gash has aroused public opinion on his medal picture (No. 130). At first we were inclined to find fault with the award, but, on studying the matter more deeply, we have come to the conclusion that the Judges were not far out. To surround a bright (though perhaps in the print forced) light by dark and subtle shades running in straight lines is a canon of art not fully learned yet by the average photographer (forgive us for speaking so plainly). The selection of the subject is happy and the main idea well developed—again forgive the word. Some say the shadows are slanty and harsh, but look how nicely they are treated and balanced; the eye is led unwittingly from point to point, and is able to jump the apparent obstacle without feeling the "jolt." The light and shade are exquisite—no detail too subdued and yet not too prominent. Yes, we think the award not out of place, all things considered, and we say so because we looked carefully round the room to find a better picture, and, like the man who tried to jump into his pyjamas on the clothes line, we signally failed to do it.

The Liverpoolian, C. F. Inston, is next on the list; he has again got a medal, and no fault can be found with this unless it is the fact that his prize picture is a little like and more perfect than the one that got the medal last year. *The End of a Stormy Day* (No. 148) is very truthful, but his medal picture (No. 191) is luminous in the extreme, and the delicacy of the clouds and perfect rendering of the sea leave no doubt as to the merits of the picture. Mr. Inston sends some head studies, which indicates that he is extending his choice of subject, and we shall look for something equally good from him next year, only in another field. His *Sheep Study in Winter* (No. 162) is also very good. There is no "fake" about this exhibitor's work; he is honest, and has the courage of his convictions.

Mr. Rudolph Eickemeyer, junr., sent two examples of his versatility. No. 140, *When the Daylight Dies*, is the same as exhibited at the Salon, and we heard one gentleman's remark on the subject that was rather funny, and perhaps a little unkind. He said the title ought to be "When Judson Dyes." The other picture (No. 226) is one of the daintiest bits in the Gallery. *The Dancing Children* are dainty, the composition and lighting are dainty, and the work itself is daintily executed. The interior is in the artistic style depicted by Haynes Williams—we will not say Maud Goodman.

No. 174, *A Fair Artist*, by H. Stuart—his only exhibit—is a sunny bit of work, and looks all the more vivid in being hung next Mr. Page Croft's *December*.

The sunlight studies of Mr. C. Keith Humphreys are also well rendered, particularly No. 181, *A Sun Bath*.

Mr. J. Kearney, junr., has many exhibits; in point of numbers, taking individual prints, he has the maximum, many of them good, particularly his sheep studies (No. 182); but why mount them all in one longitudinal mount when the "light line" in each print varies to such an extent as to be positively painful at a short distance, and utterly spoils the whole? Individually mounted in the same manner, the prints would be immeasurably improved. Mr. Kearney is still a votary of the "lamp-post" school, vide his *City Mists* (No. 221) and No. 269; but his *Woodland Sunshine* (No. 254) is his best effort. The shadows on the tree-trunk are not only truthfully, but artistically, done.

Mr. Thomas is represented by two works only, one in his usual picturesque birch and-bracken style (No. 188), rather flatter than usual, but very beautiful, and the other (No. 271), called *The Pool*, is anything but up to this gentleman's standard of excellence. It is the hackneyed scene in the Pool of London, with the same old steamer on the left, and the same old cloud above, and the same old softened-down Tower Bridge in the distance, made a little more misty and softer than usual to tone down the harsh light, but still the view that we get in everybody's guide-book to London.

No. 189, *Fruit*, by J. M. Whitehead, and his medal picture of *Roses* (No. 276), came in for considerable attention, opinions as to the award flowing freely from the mouths of various critics whose opinion on such matters is looked upon as authoritative; but we admired the work, and, whatever is said about it, it is certainly very fine, if not worthy of a medal.

There can be no two opinions on Mr. J. H. Gear's carbon print reproduced in the catalogue. There is only one description for it; it is "Leadereesque."

Mr. Rawlings' pictures, too, should not be overlooked. No. 99 is like Mr. Hinton's scene of the same subject last year at the Salon, which it equals in artistic merit, and No. 259 may be judged from the illustration in the catalogue.

*Ancestral Trees* (No. 218), by A. G. Lawson, is a very sunny beech-tree picture, and we should like to see a few more of his pictorial results.

Mr. Vivian Hyde's work is, as usual, uniformly good. His first picture, No. 161, *Where Rushes Grow*, is delightful in its quiet tones, and the straight lines of sky and foreground are so nicely harmonised that they fail to obtrude unduly—a difficult subject for a photograph, but very ably treated by Mr. Hyde. No. 205, *Fishing Smacks Leaving Harbour*, speaks for itself through the catalogue, where its artistic qualities need no comment from our pen. No. 211, *A Surrey Lane*, we like least, though this is by no means a bad subject; and No. 260, *A Surrey Mill-pond*, should not be passed by.

*The Verge of Day*, by Mr. Bertram C. Wickison, is another beautiful landscape. We are not sure about those reflections with the deep-toned bank and dark tree trunks. The water beneath should be darker also; if one part is reflected, so must the other be if in an exactly similar position. There are signs of treatment, too, in other places, which give the wanting touch to relieve the flatness in the shadows; but that touch is so artistically done that we had better not question its legality.

No. 219, by Philipp Ritter von Schoeller, is one of the little gems of the year, the reproduction being about "life size." What "sentimental" thoughts this little half-tilted boat near the sand dune by the sunlit sea conjures up in our memories. Peace, too, reigns here supreme, and, as we gaze at it for a moment, our thoughts get lost upon that quiet little seashore, and we are lulled into forgetfulness by the soft lapping of the waves, oblivious to the present and the exigencies thereof. Such is the power of sentiment over the captious critic. This gentleman with the long name has several other exhibits, but none of them so fine as this.

No. 227, by the G.O.M. of photography, is also illustrated in that wonderful catalogue. The picture speaks well for the unabated vigour of its producer, but we could almost wish for the sequel picture. Perhaps we shall get it—let us hope so—next year.

No. 238, see catalogue again; a fine study by Oscar Hardee of *Silver Birches*.

No. 241, by W. A. J. Hensler, is a good mud-flat study. This gentleman's work is excellent throughout, and his print, No. 267, specially good, though too much foreground is shown.

No. 275, *The Glow of Summer Noon*, by Mr. J. S. Mummery, appeals to us at once, and has been much admired by all with whom we have spoken of it. It is a difficult subject to treat, but the lines are well broken by the shadows and figures, the posing of the latter being most unconventional.

The "Romney" portrait (No. 303) by Mr. Walter Monro, is at once an ambitious and artistic effort; moreover, it is successful, and those who are acquainted with the artist's picture will notice that the likeness is strikingly like the original.

#### THE TECHNICAL SECTION.

The thirty odd exhibits in the Technical Section are of very great interest. Mr. Sandland's *Lion at the Zoo* (No. 331) shows the king of beasts in a most natural attitude. The Autotype Company contribute several facsimile copies of Rembrandt etchings in photogravure (No. 332), and some collotypic illustrations in colour for Lord Armstrong's book, *Electric Movement in Air and Water*, and a splendidly produced carbon enlargement of a negative by the Rev. C. J. Moncrieff-Smyth of *St. William's Hostel, York*. Father Smyth's negative is an uncommonly good one, and the enlargement does it every justice. For a copy of an etching made by "allowing green or yellow light to fall upon bromide or Alpha paper, placed with the sensitive face in close contact with the picture copied, the bromide paper lying interposed between the light and the picture," Mr. J. Hort Player takes a medal. He has half-a-dozen examples of this interesting process. *Rainbows in the Skies* (No. 341) is Mr. William Andrews' exhibit. The photographs "show that the tint of the sky is lighter inside the bow than the outside. One of the prints also shows the secondary or outer bow." These photographs are of interest as elucidating some of the little-understood phenomena of rainbows. Mrs. Walter Bersey (No. 350), a large portrait by Mr. T. O. Turner, gives him an opportunity of showing his skill in this class of work, but Mr. Turner's powers have not yet been fully demonstrated at Pall Mall. Kodak, Limited, exhibit three enlargements, showing the effects of enlarging through bolting cloth: "(a) Enlargement on smooth Royal



bromide paper without bolting cloth; (b) a similar enlargement with bolting cloth in close contact with the surface of the bromide paper; (c) a similar enlargement with the bolting cloth at a distance of three-eighths of an inch from the surface of the bromide paper; (d) a contact print from the negative from which the foregoing enlargements were made."

Three Lippmann photographs emanate from Mr. E. Senior, though we doubt if they will be properly seen in the position in which they have been placed. There is a picture of the *Eclipse of the Sun as Seen at Quetta* in 1898, by Mr. Fred Bremner, showing the disc surrounded by a mass of clouds. Other exhibits of scientific and pictorial interest also figure in the section. In the lantern-slide department, half a dozen Joly coloured transparencies of flowers by Miss Alice Worsley, the best results we have so far seen by this process. Other contributors of lantern slides are Miss Acland (portraits), Messrs. Malby (flowers), Graystone Bird, Kearney & Kelsey; but the glory appears to have departed from this part of the Exhibition. General E. F. Lloyd is responsible for a dozen carefully prepared stereoscopic transparencies, although personally we should have preferred them in a warm rather than a dark colour.

#### THE APPARATUS SECTION.

Most of the exhibits in the Apparatus Section have recently been fully described in our columns. Messrs. Houghton show an adaptation of the principle of the Sanderson front to hand camera, and Lloyd's rotary print-trimmer, which is said to give clean and true edges to a print without buckling it. Among Messrs. Watson's exhibits are the Gambier Bolton hand camera, the Binocular stereoscopic camera, and the Kromaz colour apparatus. The Tella Camera Company show the latest form of this admired instrument, and Mr. Thomas Webster a printing frame, which allows of the whole of the picture to be seen at once, and a simple little flash lamp. For one of a series of original engraved screen plates, Messrs. J. E. Johnson & Co. take a medal, the ruling being 200 lines to the inch. Zenith cameras and the folding pocket Kodak camera are exhibited by Kodak, Limited. Mr. E. Sanger Shepherd's exhibits include examples of tricolour photographic printing in transparent media, a set of light filters for the work (for which he receives a medal), and the Cadett light filters, Mr. Cadett himself being responsible for a colour sensitizer and orthochromatic plate standardiser, "an instrument which, by means of diffused light passing through adjustable openings and selected colour media and a series of diaphragms to the sensitive plate, affords an easy method of testing orthochromatism, and the safe light glass for the spectrum plate."

Messrs. Mackenzie & Co., of Glasgow show a daylight slide which enables dry plates or films, when placed in the envelopes provided, to be changed in daylight. "The envelope is of a stiff, light-proof cloth, in two parts, and is laid within the slide upon the shutter. The shutter has a groove which engages with a prominence upon the flap of the envelope, so that, when the shutter is drawn, the flap of the envelope is drawn from over the plate with it. There is an opening in the back of the slide covered with celluloid, through which may be seen whether the envelope flap is working properly, and any number upon the envelope. After exposure, the shutter is closed, the same action closing the flap of the envelope, which, with the plate inside, may then be removed, and another inserted in its place."

Messrs. Marion's exhibit comprises the Massey field and studio stand; the Perfect developing dish; the Sectional print-washer; the "Soho" circle print trimmer; a new form of the Hurter & Driffield actinograph; a film-holder to support films during development; a tripod stay; and the speed-testing printing frame, which is a printing frame of the usual type provided with six narrow shutters side by side for the exposure of the plate in strips.

The Cyko camera, No. 4, is shown by Messrs. John J. Griffin & Sons, who also send a frame of curious effects obtained with kaolin. An adjustable vignetting apparatus comes from Mr. Charles S. Southin. "It consists of two light frames of wood and metal, the lower or metal frame being attached to the printing frame by means of a clasp and mill-headed fixing screw, and having a horizontal movement across the printing frame. The top wood frame, which carries the vignetting card, has a movement in a transverse direction to the bottom plate, and can be raised or lowered to any angle or height by means of screwed studs and nuts and a spring. A light-diffuser is attached to the top frame." The Secco Film Company send two capital negatives on Secco films, and prints from negatives made on Secco films and Messrs. Spratt Bros. a 10 x 8 long-focus light field camera and three backs, and a whole-plate long-focus light field camera and stand. Metzograph screens for graining photographs are sent by Mr. James Wheeler, who also exhibits results obtained by his method.

#### THE PHOTOGRAPHIC SALON.

UPON one feature of the Seventh Exhibition of the Photographic Salon we unhesitatingly congratulate those who are responsible for bringing together the collection of photographs and other things which are now to be seen at the Dudley Gallery, Piccadilly. We allude to the omission from the catalogue of the so-called Forewords which, in the six previous issues of the compilation, prefaced the list of exhibits.

This precious deliverance, which varied slightly in manner, but scarcely in matter, from year to year, must be held responsible for a great deal of the ridicule and contempt which the principal photographic and non-photographic newspapers and reviews in Great Britain have always cast at the Salon. Condensed in meaning and teaching, these monumentally stupid Forewords asked people to believe that pictorial photography did not exist before 1893; that the Salon was the only place where pictorial photographs were shown; that all the exhibits there betrayed evidences of personal control and inspiration; that they were produced in virtue of a boasted ignorance of optics, chemistry, and the "mechanics" (*sic*) of photography, &c. If all, or any, of this balderdash were true, then a "photographic" Salon, which ostentatiously went out of its way to belittle, if not to deny, the paramount aid of photography in the production of its exhibits, was a sham in name, if not in essence. The word "photography" had no business to be used at all in such a connexion.

The suppression of these silly and harmful forewords should disarm a great deal of the opposition they always provoked, and must be regarded as a tacit admission by the Salon folk that the contempt previously shown for photographic knowledge in pictorial work was an indefensible piece of folly which they are now anxious to wipe out. It is indeed fortunate for the present Exhibition that the Forewords have been abolished, otherwise we should have had the curious sight of a conflict between theory and practice, the Forewords calling the Salon Exhibition one thing, the Exhibition itself silently, but none the less effectively, showing that it was partly something else altogether.

For this year's Salon is a mixture of exhibits which are obviously photographs and other things of which the method of production affords scope for a considerable amount of guesswork. On the one hand, exhibitors such as Mr. Annan, Mr. Baker, Mr. Bright, Mr. Cameron, Mr. Hubert Elliott, Mr. F. H. Evans, Mr. Greatbach, Mr. Greger, Mr. Histed, Mr. Lankester, Mr. Ralph Robinson, Mr. H. P. Robinson, Mr. Leyton Scott, Mr. W. J. Warren, Mr. Wellington, and others, show us results in which it is easy to trace the predominating influence of the knowledge of how to use a lens, expose a plate, develop a negative, strike a print, and yet secure a pictorial result. Be it ever so pictorial, the photograph is there.

But, when we turn to many of the gum and other prints in the room, we are met by the obvious fact that their producers have strenuously sought to conceal their source of origin. You are conscious that attempts have been made to imitate charcoal drawings, stippling, etching, and water-colour work; and that, while these attempts have only met with partial success, and in some cases are mere burlesques of the real thing, the photography of the work is unmistakably bad. The exercise of the much-desiderated personal control has introduced distortion of outline and perspective and destruction of structure, the laws of lighting have been set at defiance, tone values falsified, and definition subdued beyond all recognisability of subject. This is not good photography.

The Salon, in fact, this year is a double Exhibition—photographic and non-photographic, and the results shown automatically classify themselves under two heads. If this sort of thing continues, would it not be well in future for the Salon to go in for a technical as well as a "pictorial" section? Then we should know where we were. At present we are asked to admire two sets of productions—good photographs and bad photographs, or, at least, to regard them from two standpoints in diametrical opposition. Clearly the Salon is a "photographic" Exhibition or it is not; in either case, half the work shown this year is out of place; but, if in future would-be exhibitors are asked to specify how their pictures are to be classified, "technical" or "pictorial," the present difficulty would be easily got over, and in that case the Salon would, doubtless, appoint technical and pictorial selecting committees. Who knows?

This year we have an artificial striving after pictorial effect that is, at times, ludicrous. One ingenious gentleman, a very clever experimentalist no doubt, gives us:—Two Brown Studies, A Puzzle in Indigo, A Villa in Green Gum, and A Study in Coloured Chalks. They are, some of them, very nice indeed—very picturesque, full of feeling—but in our humble opinion, in certain instances, they are utterly without the bounds of legitimate photography. Let us take a few examples of well-known



workers from the catalogue and analyse them indiscriminately, contrasting here and there the good, bad, and indifferent.

The first name of note is that of Robert Démachy, whose work is so well-known to our readers that they will readily follow our criticisms. His eleven exhibits are in excellent taste, but some naturally appeal to us more than others. His first exhibit, No. 2, is in the red chalk style with semicircular mount. *A Child* is no title at all, but is sufficient to indicate that the print contains a figure, in this instance not the graceful model that we are accustomed to from this exhibitor. The child is laying at full length in an uncomfortable attitude, with a look of abject fear on its face quite unlike what one expects, except in the work of such exhibitors as Mr. F. Holland Day.

Mr. Démachy's next study (No. 7) is more charming. *Première Communicante* (No. 15) is full of expression and feeling, and shows us that the French model is far superior to the usual stiff and hard-hearted English dummy. No. 20 is also a very pleasing study of a market girl (the model free from self-consciousness again), and No. 31, *A Fishing Boat*, shows Mr. Démachy in an entirely different light. Here is motion in the boat and waves, and one feels at once, instinctively, what the artist intended to convey—like the boat pictures of the late Edwin Ellis, which it much resembles in treatment—this is, at once, broadly and freely treated, yet nothing is lost in the effort. Again Mr. Démachy's versatility is noticeable, for next is a delightful little head (beautifully framed too), and further on a portrait (No. 99), and, again (No. 106), *La Malmconia*, and several others. No. 123, a portrait in the open air of a girl with pampas grass, is rather spoilt by the dark figure against the light glass, and, as this is placed close to a charming picture (No. 125) by Mr. Ralph Robinson, the defect is the more noticeable.

Next, following the names in the catalogue, comes *Spring*, by an American contributor, Mr. Clarence H. White. He divides his picture, that of a female—a la Albert Moore—in a garden of spray blossoms, into three parts, putting the lady in the centre and blossoms in separate panels on either side; the subject is good and nicely treated, but it is old, and the price (71.) including the ingenious mounting and framing somewhat heavy. Mr. White's other pictures, Nos. 114 and 174, are worthy of more than passing recognition. Mr. Will Cadby's work follows; and, if No. 6 is a true rendering of his landlady, we are sorry for him, and for her, poor woman; we should also think her dear at the price, viz., 10s. 6d., for she is very infirm, very chalky, and very ugly.

*Swiss Hay Sledges* (No. 29) is another that we cannot for the life of us either understand or appreciate; picture a snow hill, and silhouetted against it in black what look like a removal pantechnicon with black horses and black figures at more or less regular intervals. This may be a gum effect, but whatever it is called or intended to represent we neither know nor care, we can only say that, like gum, it sticks very unpleasantly. No. 84 is better, but it resembles a slight sketch of a snow scene, done, as we heard a passing critic remark, "with a stump and chalk." No. 158, *A Snow-shoveller*, is another "crayon" study, and we should recommend Mr. Cadby to bury his models as quickly as possible and find others, for a thing of beauty is a joy for ever. How about a thing of ugliness? Is it art? is it photography?

No. 10, *Cigarettes* (a sketch for a poster), by Clement Hopkins, is a black-and-white figure, whose arms, body, and legs are all apparently in uncomfortable and grotesque attitudes. Perhaps it was originally intended for the potency of So-and-So's "Special Scotch," but the perpetrator did not like to give his friend away, so he altered the title. Again, we say, Is this art or photography, or artistic photography, or utilitarian eccentricity?

No. 47, *Puss in the Corner*—a study in red chalk. The kitten days seem over; the figure is ugly in pose, and her attitude might have been suggested by the more graceful "French" picture *Le Souris*. The foreign element is much to the fore this season, and we cannot but admire some of the strangers' clever work, and suggest that our own countrymen might condescend to take a lesson occasionally therefrom.

Mr. Puyo's work is in his usual characteristic and artistic style—his maidens three—whether under the title of *panneau décoratif*, and whether singly or taken together, are always delicately taken, exquisitely, though perhaps not always truthfully, lighted and charmingly treated.

We should like to, but we cannot, say so much for the work of Mrs. Kasebier; it is more eccentric. Her models are not as beautiful as butterflies; her tones are dark, and a feeling of deep melancholy pervades one's inner consciousness as one gazes on the sad faces of her subjects; yet this lady's works are lifted above the plane of mediocrity by the originality of their composition and treatment. Her picture (No. 127), *Mother and Children*, is particularly well done, and we should like to see more of it. The tones are lighter; that intense blackness which we

notice in many of the pictures this year, and which seems to be the prevailing craze, is not so noticeable in this clever lady's last-mentioned work. No. 12, *Sous Bois*, is a luminous treatment of the parallel tree subject. It has most of the good qualities and few of the bad ones for a picture of its kind.

The work of Mr. Eustace Calland is somewhat disappointing. No. 13 is, perhaps, his best, and is a light treatment of a landscape similar to those exhibited some years ago by Mr. G. H. Boughton at the Royal Academy. No. 78, *At Twickenham Ferry*, is a good imitation of a bad black chalk drawing, a very black chalk drawing, and where the ferry is we don't know; but this print was mounted on a larger white mount, which completely smothered it. It was altogether unworthy of Mr. Calland's reputation. No. 151 was nearly as bad, horrid straight black lines running right across the picture from the bottom left-hand to the top right-hand corner, dense black masses of trees, no delicacy, only glutinous gum. Stick not to the modern craze of anti-photographic processes is our advice to those about to photograph anew.

No. 24, *A Normandy Road*, by Mr. C. H. L. Emanuel, is a somewhat similar subject.

No. 44, *A Portrait of Sir W. B. Richmond*, is a clever bit of work, as is also No. 172; but the latter is sadly over-mounted.

No. 51, *The Willows*, by Miss M. Devens, looks very pretty in its red chalk and nice gold frame; and No. 52, *La Cigale*, is also a drawing-room article *de vertu* in blue and gold, strongly reminiscent of the Flaxman style of decoration.

No. 58, *Wind and Rain*, by Charles Moss, is really excellent and full of artistic feeling; but why not do it in charcoal at once? This applies to many of the photographs so called, that hang on the walls of the Salon. No. 148 is another by the same gentleman, only of the mud-flat school, which it very closely copies; and No. 225 is another worth noticing *en passant*.

Prices are high this session. Mr. F. W. Birchall has a weird and mystic subject (No. 55), called *The Trinity of the Dawn*, price 12l. 12s. We are not sure whether the picture was hung so high on account of the price, but it is in the sacred corner of religious art—the most expensive corner, by the way, in the show for its size. Three prints. Total cost, twenty-four guineas. Things must be good for those amateurs that devote themselves to religious mysticism.

The further we go the more gum we get. Mr. George Davison is devoted to it. No. 60, *Night and Morning*, is a black-and-white treatment. In the distance, white (dirty white) robed choir boys in the nearer distance, or foreground, are what appeared to be very large notes of interrogation, but what, on closer inspection, were found to be men in rather crooked postures—black men, white boys—title, *Black and White*. Mr. Davison had a lot of these dark and dirty-looking pictures, that appeal neither to the photographer proper, nor (rarely indeed) to the artist, unless of the pronounced new English style, or of Whistlerian school. Look, for example, at No. 66 and at No. 116. If this is photography, let us play at painting and call it art. *Boulogne Quay* (No. 138) is certainly very finely rendered, but gives one the "blinks" to look at it for long; and No. 146, *Hayling Island*, is also an exception to the above rule.

No. 64, *Auld Reekie*, by Mr. Ralph Robinson, brings us to the other side of the subject, and we must congratulate Mr. Robinson, senior, on having such an apt pupil, a real chip off the old block, for his work is always artistic, careful, and most perfect in technique. This picture is somewhat weird perhaps, but leaves no doubt on the mind of the spectator of its "motif." Let us carefully follow Mr. Robinson's other work, which we can always do with advantage. No. 109, *Heads of a Girl*, are all graceful head studies, tastefully mounted and framed, quite a harmony in brown. The only fault we can find, collectively, is with the lighting on the arms, which makes parallel lines of the arms of the two figures on the left, and this is rather emphasised by the third arm being posed and lighted in the same way, but in the contrary direction. Individually mounted, this would not, of course, be noticed. Still, the three heads are exceedingly beautiful. No. 125 is another fine example. The perfect rendering of the face and figure dead against the light without halation, and the interposition of the black hat, are triumphs of the photographer's skill and artistic ability. No. 143, *Portrait of a Clergyman*, is all right photographically, but the man of the cloth looks very ill at ease, and as if he had something under his coat that he would very much like to get rid of without being detected in the act. No. 167, *La Penseuse*, is also characteristic of the worker, but the lopping off of half the head and figure seemed a pity to us. No. 171, *In an Old Window*, looks like a smaller study, on similar lines, to last year's picture of the same subject; and here we might refer to the picture by



Mr. Robinsen, senior, viz., No. 91, *Old Dapple*. The picture of a fine horse standing squarely on its legs, the envy, admiration, and delight of the bystanders, who are posed in the way familiar to us in our veteran's earlier works. The picture is taken on one negative direct, and is worthy of a high place in the collection of its able producer.

Of Mr. Greatbatch's work, No. 68, *The Ford*, looks rather on the slant, but No. 192, *In Winter's Garb*, reminds us of a similar scene entitled *Chill October*, exhibited a year or two ago at a local Exhibition—we forget by whom—but the two subjects are precisely alike; the one was a painting in oils, whilst this is an excellent photograph.

The Hon. Secretary is represented by two works, Nos. 69 and 83, both of them fair samples of the advanced style of portraiture; yet Mr. Craigie seems terribly afraid of getting a little too much detail or definition, and we do not consider his work equal to that of last year. No. 74, by Heinrich Kühn, is a solitary example by this clever operator, and we are sorry to note the fact. The title is almost sufficient to indicate the nature of the study (even to English ears). The picture is very sunny, a little too subdued, perhaps, considering the amount of light and shade, and also marred by the fact that the bold clouds contain a caricature of a face which is exceedingly unfortunate for exhibit and exhibitor, alike, for a blemish like this, once seen, grows on one and obtrudes to such an extent as to become painful.

No. 75 is another blue or green gum picture from the brush of Hans Wazek. This, again, is more pictorial than photographic, though very full of feeling as a work of art. There is another, but not nearly so nice, and with much more Prussian blue and indigo in it; this is No. 227, and may well be passed over without comment.

Baron A. von Meyer is not by any means so well represented this year as last. His portrait in the style of the old masters is by far his best picture, but we presume he has not had the leisure to devote to this favourite hobby, owing to his recent marriage.

No. 85 was one of the best portrait pictures in the show. The catalogue says it is a portrait of *Miss Bourke*, daughter of *Hon. Mrs. Edward Bourke*; but, whoever she may be, she has a sweet face and a beautiful figure, which are shown off very effectively, and spoilt only by being contrasted with a very conventional stained-glass window, the pattern of which will catch the eye in spite of the other and more beautiful attractions of the print. This is the work of Mr. Robert Johnson, who also shows a portrait of *Mrs. H. Beerbohm Tree* (No. 95) and the *Study of a Girl's Head* (No. 219).

No. 86, *Evening on the Lune*, is by Mr. Alex. Keighley. This is a dreamy, misty, in-the-gloaming kind of river scene, where "the shades of night are falling fast," and all is subdued and peaceful, even the ripple on the water might be mistaken for a moonbeam that had got lost and gone astray, and was struggling to find its way back to its original source again. The ancient-looking hostel in the distance could not be associated with the modern and hideous river-side pub., such is the artistic treatment of the picture, and, if the details are occasionally somewhat wobbly, we must appreciate the poetic desire of the exhibitor whose work generally meets with universal approbation.

No. 94, *Dutch Fisher Folk*, is also good, somewhat low in tone, perhaps, and a little flat, but the composition is excellent, the positions of the figures (taken just at the right moment) give immense relief to the scene which rather follows in the footsteps of the French school of "under-tones." Mr. Keighley has evident flights of poetic fancy. *An Old Viaduct* (No. 96) is another example of this—not that we decry poetic treatment; on the contrary, this is particularly successful and we like it, and *An Old Viaduct* appeals to our senses in the way we hope its exhibitor intended it should, the only thing we would wish to impress upon the general workers of this school is, Don't overdo it; ambition to be artistic—practically artistic—is a great ambition, but it is not always practicable, particularly when limited by technique, such as the requirements of photography demand.

We are sorry not to see more of Mr. Percy Lund's work. No. 101, a nude figure, is not up to the standard expected from Mr. Lund, but this is amply atoned for by No. 232, entitled *Halcyon Days*, a figure study in the operator's best pastoral style. The brown canvas mount, too, is in perfect harmony with the print and frame.

Next we come to the work of Mr. A. Horsley Hinton. No. 105, *Gorse Bloom*, is not in the artist's happiest vein. A large and picturesque sunlit mass of cloud floats over a gorse-covered landscape; but somehow the landscape and the cloud do not appear to fit each other in the way usually associated with the exhibitor's best work. The cloud in itself is perfect; the landscape has been made to support it, but it comes in badly somehow; there is a fitful gleam of light on a corner of the gorse, and a fuzzy, sunned-down, artificial appearance about the rest of the

foreground and middle distance that detracts from the value of the work as a whole; yet we must not condemn the picture unduly, as we know the exhibitor was very pushed for time, and could not give his work the care and attention it needed to bring it nearer perfection and nearer the operator's own standpoint. No. 197, *By the River*, is much better; in fact, there is little to be desired in this work, it is truer and less artificial-looking. The tall trees are characteristically wrought, the light leaving the sky as it does helps to bring these trees in bolder contrast against the smaller ones, thus giving a greater effect of "breadth" to the whole than would otherwise have been the case. The beautiful well-lighted foreground assists in no small measure in imparting a strong interest to the subject, and at the same time gives value to the distance by contrast. That the lights have been lightened or the darks darkened to attain the ends of the artist may or may not be true, yet the effect is very striking, the only apparent triviality that has escaped the lynx eye of the exhibitor is the "undarkened" patch of half light in the immediate foreground, a fault so trivial that it is hardly worth while recording. No. 206, *After Rain*, is again not so pleasing. It is weaker in treatment, lacking in interest; particularly is this noticeable between the trees and the bottom of the picture; there is also a fuzzy look, as if the work had been sunned down all over, losing that "crisp glisten" that one sees "after rain," and which, we admit, is very difficult to obtain in an artistic manner in photography or in painting. The introduction of cattle, figures, or sheep, would help the picture somewhat; but we are not in love with the scene, and pass on to the next, which is No. 214. *In a Yorkshire Glen* is more on a par with his last but one, and resembles in choice of scene one of his pictures exhibited here last year. The rugged and mountainous path, lighted with the object of throwing the huge stones into greater prominence, the tangled trees dark against the high sky line, all help to make a romantic picture; the only thing one misses is a connecting link of distant hill to bridge the distance between the trees right and left, a scheme Mr. Hinton introduced, if we remember rightly, in his last year's picture.

Mr. W. Thomas is only represented by two works this year, Nos. 107 and 153. *The Mill Dyke* is good and slightly out of Mr. Thomas's usual style, but his *Woodland Glade* is not up to the standard of perfection one naturally expects from such an experienced worker. Nor are Mr. J. B. B. Wellington's subjects (Nos. 92, 108, and 189) as good as usual. They are somewhat black and harsh. Mr. Wellington has done, and can do, much better work than this.

Viscount Maitland is not so well represented as hitherto. *A Flooded Road*, No. 88, is a very fine piece of work, but his other subjects do not appeal to us, although his *Sunset* (No. 168) if it were a painting, might do so.

No. 180 is a nice little portrait study by Sidney Herbert, but the one next to it, No. 131, *A Study in Flesh Tints*, is peculiar both in style and treatment.

Mr. Harold Baker sends five pictures this year. An excellent portrait of S. H. Baker, Esq., R.E. (137), another portrait of the Countess of Warwick (142), a clergyman who looks very ill (143), a most important and very fine study in costume of Mr. Scott Baist. The latter is a triumph of posing, lighting, and technical skill, and is undoubtedly Mr. Baker's best effort. His last exhibit, No. 191, *But let my one feet never fail To walk the studious cloisters pale*, is also extremely well done—it is both artistic and technically good. No. 182, *In the Jasmine Tower, Agra*, by Mr. E. R. Ashton, is a work to which the same remarks apply.

Mr. W. J. Warren's pictures, too, deserve careful attention. No. 186, *The Man in Armour*, is, as its title implies, a man in armour; it is only small, but good; rather over-framed if anything, yet this keeps the strong light out—perhaps the idea of the exhibitor. No. 215 looks very like a Whitby stranded boat scene—has a long foreground and a subdued artistic atmosphere about it that is rather taking, and No. 246 was a portrait of S. W.

No. 200, by Walter Bennington, helped to throw up Mr. Hinton's picture, close by, very considerably. For those who have plenty of time, and a little ingenuity it will afford them an opportunity for exercising the latter quality in trying to identify the nature of the things represented by white blobs spotted over the foreground and middle distance of this picture. To give the artist his due, the lines of the composition are rather nice, but the execution!—well, three white dots and a smear don't make a foreground, nor do four fat finger marks and a black line make a tree.

No. 205, *The Black Cat*, by Mrs. Cabot, would sound better if called *Le Chat Noir*, and look equally well, for it was not a bad idea.

The portraits of Histed are, without exception, excellent. There are five of them—Nos. 216, 223, 234, 241, and 256—and they should be care-



fully studied, as well as Mr. Craig Annan's sole exhibit, the portrait of Mr. Orchardson, the artist. Alas! that we have not more "Orchardsons" and more "Annans" in this gallery. It was universally admired; even from the most "progressive" exhibitor down to the humble critic, all vied with each other in praising the portrait of the show.

No. 243 was as good a "game" study as any in the room, but the "young lady" was "prepossessing."

A rather rich treatment, somewhat resembling a dry-point etching, was noticeable in the picture of Mr. W. E. Dawson, No. 253, *A Birch Glade in Sherwood Forest*. The velvety black foliage against the yellow-toned sky was an effective arrangement.

### OZOTYPE.

On my return from a holiday, I have just come across your issue of August 18, containing a letter from an American correspondent, Mr. Colin Napier, relating to "Ozotype." I am sorry to say that in nearly all the working instructions with regard to this process which have been published unauthoritatively the writers do not strictly adhere to the method of working I laid down in my paper before the Royal Photographic Society, and so experimenters are led into error.

In my opinion the principal cause of failure is soaking the carbon tissue too long in the acetic solution, and the omission to thoroughly surface-dry the squeezed print and tissue between blotting-paper before hanging up to dry. It is astonishing what a small quantity of acetic solution is required. The temperature of the acetic solution should be between 65° and 75° F. for smooth paper. The carbon tissue should be immersed for one minute when soft tissue is used, and for one and a half minutes for hard tissue. At the expiration of this time the print should be brought in contact with the carbon tissue under the surface of the solution (of course avoiding air bubbles), and the two, clinging together, withdrawn at once, this operation lasting about ten seconds. Squeeze and surface-dry as soon as possible, and hang up to dry. When dry, immerse in cold water for twenty to thirty minutes, and develop in water at about 106° F. Glycerine added to the acetic solution will be found of great advantage. A good formula for ordinary rather plucky negatives is:—

Water .....	40 oz.
Glacial acetic acid .....	1 drachm fluid.
Hydroquinone .....	15 to 20 grains.
Glycerine .....	2 drachms fluid.

Do not over-print.

I take this opportunity to enjoin experimenters to wait a little while. An improved sensitising solution and a special carbon tissue are being prepared, and, when everything is ready, those photographers who aim at producing artistic pictures in a permanent medium, of any colour and on any paper, will be surprised to find how easily it can be done.

THOS. MANLY.

### EXHIBITIONS AND EXHIBITORS.

[Abstract of a paper read before the Hackney Photographic Society.]

I HAVE often been asked by photographers, anxious to improve their pictorial work, what they should do, are books of any use, should they study other people's work? and so on. Well, really it is a very difficult question to answer. Some of our books are written by men who know what they are talking about, and the study of the pictures produced by our best workers is bound to repay can we but keep out of the sin of copying. I do not suppose any one would deliberately set himself to direct copying; what we have to avoid is too close an approximation of style and treatment. At the same time the scope of the pictorial photographer is not great, and there are not enough styles to go round, so that, if you do by chance find an opening for your taste in a similar direction to another worker, I should advise pursuing it with all your ability, rather than attempting to make a change. For instance, if birch-and-bracken subjects are to your taste, and you put forth all your efforts in that direction, do not change to architecture because Brown says you are imitating Jones. Considering the limitations of photography, some of the press outbursts on plagiarism are just a wee bit far-fetched, and, any way, you need not pay much attention to them. By all means get an absolutely original style if you can, and I should strongly advise this, were it not for the absolute impossibility of it.

Another piece of advice is to absolutely shut your ears against the hysterical technical photographer and his denunciation of "faking." He only wants you to be upon the same level as himself, and shorts if you mount a step higher on the ladder. What he can do to a negative or a print he terms "improvement;" what you can do beyond this he terms "faking." That is all there is in this cry of "faking." We all try to improve our results; we intensify, reduce, alter tones, and do hundreds

of things chemically, optically, mechanically, or any other "cally," so why not "fakeally?" To put it broadly, if a dab of dirt at a certain part will make an improvement, dab away; if a mark that is obtrusive can be removed by soap and water, wash it. What you do and how you do it matters to no one, the resulting print will still stand upon its merits. If what you do is an improvement, it cannot offend by obtrusiveness, and therefore it is right. The question of what is legitimate and what not, is a good subject for an evening's discussion at a society when the promised lecturer does not materialise, but it is not one that an earnest worker should even consider. It is a subject teeming with humorous possibilities of debate, but should be reserved for an evening's relaxation from photographic work.

One more point and I must leave the exhibitor. It is that each one should endeavour to assist the Hon. Secretary of the Exhibition, and to find excuses for him and his co-workers, rather than, as is usually the case, giving him a lot of trouble through carelessness, and doing no end of fault-finding in addition. We are apt to forget that the officials of an exhibition are, as a rule, unpaid voluntary workers, giving as much time as they can squeeze out of business hours in addition to all their spare time. I speak from the dual points of exhibitor and organizer, and know full well the faults on both sides. But I think there is less consideration shown by the exhibitor, and more by the official responsible for the exhibition. Exhibitors will not follow out rules, regulations, and instructions, and many troubles are thus caused. For instance, at a recent exhibition that I had charge of, a framed portrait arrived with absolutely nothing on back or front of frame, nothing on the wrapping paper to indicate who it came from, and the post-stamp was undecipherable. A month or two after I received a simply awful letter about gross carelessness, &c., &c.—you can easily fill in the &c.s.—which, after inquiry as to what the picture was like, turned out to be the one unlabelled. How on earth I was to deal with a picture like that, no title, no class, no sender's name, and not even the town it came from, I should like to know. I could give numerous examples of gross carelessness upon the part of exhibitors, leading to unpleasant letters and crossness all round.

Turning now to exhibitions themselves and questions connected therewith, we have recently had the matter of doing all one's own work put before us rather strongly. Your first thought will be that there is very little in this, but I think upon reflection you will find it is a many-sided question. Personally I admit that, within certain limits, I should not object to part of the work being done by other hands. It may now, I think, be safely held, that purely mechanical, or even skilfully technical, work, on its own merit, is but of little consequence without the evidence of personal taste and feeling. If the particular part of the work into which the individuality can be imparted is produced by the exhibitor, the other mechanical operations are simply necessary to complete. I presume the outcry is raised against such a thing as getting an enlargement done by a trade printer. If we take it, as we are entitled to, that the merit of the result was secured in the selection of the subject, the exposure and development of the plate, why should the mechanical operation of producing a print by some one else be wrong? We do not make our plates; why shouldn't that be insisted upon as well? We may place the print in the framer's hands and tell him to use his taste in selecting a suitable frame, why is that not objected to? Personally, I do all my own work, from exposing the plate to the framing, sometimes even to the making of the frame, and therefore it is a matter I can speak impartially about. If I were to take as illustration the making of the glass plate itself before coating with emulsion, possibly that would be going too far, as the manufacture of glass is not within the power of the ordinary photographer. But certainly the making of dry plates is within our power and province, yet no one appears to think this obligatory. Many of our ideas as to what is right start nowhere and end in the same locality. Why should we skip the making of the plate and paper, commence with exposure and end up with printing, leaving out also mounting and framing? These sort of definitions are very common in photography, and as arbitrary and reasonless as common.

But, on the other hand, I admit the chance of danger in giving a free hand to the exhibitor as to what he may get done for him. It is difficult for even a trade printer to make prints or enlargements without effecting some change. There can be but few workers who would not improve a result when the chance occurred, provided it did not entail much time or labour, and that would be wrong, of course. If we could ensure that the print produced by other hands would be always inferior to one produced by the exhibitor, all would be well. But we could not guarantee this, even with trade printers. To be a purely mechanical operation, there must be no element of uncertainty as to improving the result.

Therefore, although I do not see why we should be told where to start and where to leave off, to take a very practical view of the matter, the more the actual exhibitor is responsible for the work the better.

Another question, almost a periodically recurring one, is that of Judges and their qualifications, and, although it is rather a burning subject to tackle, a paper upon exhibitions would be incomplete without some reference to it. In photography we are rather curiously situated, and it difficult to make comparisons with other kinds of judges. Photography is started as a chemical, optical, and scientific study, and it is only of recent years that we have progressed far enough in the direction of the pictorial to make this latter a serious consideration. The consequence is



that we have many men fully conversant with all the scientific side, but very few of much account as pictorial workers. We have at our exhibitions Judges who have never tried their hands at pictorial work, who know very little about it, and some of whom are actually fond of parading their entire disbelief in the pictorial altogether. Yet it is held by many that, to appreciate pictorial merit in a photograph, a man need not of necessity be able to do the same work himself. It has been an article of belief for years amongst some, that a man can be a good judge of music without being a musician himself, or a good judge of painting without being able to paint. And these opinions are held by honest thinkers, and are therefore entitled to our respect. But it is only when we get to the region of fine arts that we find such a state of things. If we descend to sport and pastime, or the more sordid breeding of fowls, bulldogs, cattle, horses, &c., the judges for these are men who have the whole matter of points at their finger-ends. A judge of bulldogs would not probably be accepted as a capable judge of butter-making unless his knowledge was as great of the latter; that is to say, he happened to be a good judge of both. But we have judges of the pictorial whose qualifications are strictly scientific. On the other hand, we are asked to believe that painters, who know nothing of photography, will also make good Judges.

I will not discuss these matters, but will give my own opinions. I feel always that I should like my work judged by men directly in touch with me, not by painters unfamiliar with photography, nor by technical men unconscious of the pictorial. I want my work judged by men doing similar work, whose photographic aims and thoughts run in the same direction as my own; whether equals or superiors matters nought, so long as they can appreciate and understand. Let me endeavour to illustrate the matter practically. Supposing in this Society you inaugurated a competition for, say, bromide enlargements. Would you elect as judges one man well known as a micro-photographer, another renowned for chemistry, photographic and general, and a third because of his fame as a carbon worker? Would you not rather choose men whom you knew had the best experience of practically working bromide enlargements?

With a reference to the Selection Committee of the Royal Society I must bring my paper to an end. This year the Salon seems to have affected the Council of the Royal Society more than usual, for there can only be one explanation of their action in excluding the Judges from acting on the Selection Committee as of yore, viz., that some of the Judges were prominent members of the Salon. We have been told so often that the Salon does no harm to the Royal Society—indeed, that it benefits it—that it comes rather as a shock to find the Royal Society admitting the rivalry in so marked a fashion. At the same time, the Royal would not admit that their Exhibition is one whit less pictorial than the Salon, and yet they elect a Selection Committee who pre-judge the work, some members of which are not pictorial photographers. We have therefore to face this year the curious state of things of two boards of Judges, and, from the pictorial aspect, the weakest one with the most power. To my mind, there is only one thing to be done, and that is, that next year the Selection Committee must be elected, as are the Judges, by the members, and not by a small body like the Council. As this year stands, we shall not be able to judge what pictorial workers think of our work, and the awards will merely be a selection of the best of those admitted. If we are to have two sets of Judges, let them be chosen in the same manner.

WALTER D. WELFORD.

#### AMENDATIONS OF THE PLATINOTYPE PROCESS.

At the meeting of the Leeds Camera Club, on September 20, a practical demonstration and lecture on "Amendations of the Platinotype Process" were given by the president (Mr. W. J. Warren). The elementary principles of the process, said the lecturer, were generally familiar to most of them. He described the different brands of paper in the market, though what he dealt with was that of the Platinotype Company, produced under the management of Mr. Willis, the original inventor, and Mr. Warren did not think any one had ever been able to say they had received a bad tin. In the production of the paper it was absolutely necessary that it should be dried at an exact temperature, and, whilst they knew the imperative necessity of keeping it quite dry, yet it would be useful for them to know, if they did get any spoiled by damp, that they could restore it by placing it in an oven heated to the exact temperature of 100° F. In a few minutes they would hear the paper crackle, and then it would be right to use. Taking, then, the normal developer, a solution of oxalate of potash 1 part to 4 parts of water, it should not be under the temperature of 160°, and it must not be acid. The effect of acidity was to give a very black image strong in contrasts, and if not well exposed, the image would not come up. Using the same normal developer, and heating it to a temperature of 160°, a decidedly warmer and pleasing tint was obtained, the exposure in this case being rather less than usual for the cold bath. A warm brown or sepia tone was readily obtained by using the same developer, still keeping it to 160°, and adding to every ounce one drachm of a saturated solution of mercury bichloride. By doubling the dose a curious effect was sometimes obtained, the image

floating off entirely. He cautioned them against printing in the sun in very hot weather, or the same result might occur. Mr. Warren next dealt with the sepia papers, which must be developed by the special salts sold by the company, dissolving 8 ounces in 27 ounces of water; this was also heated to 160°, and beautiful tints produced. By still further heating, say, to 200°, warmer tints were obtained. It was important that the same temperature should be maintained if more than one print of the same tint was required, and he showed, by allowing the bath to cool gradually to 112°, a distinct difference in the prints developed during the time of cooling down from the 160°. He showed that the sepia bath could not be used for the ordinary papers, which clearly demonstrated that not only was the solution different, but that the salts used in the sensitising of the paper also differed, and he cautioned them against storing sepia along with the ordinary papers in the same tin. By so-called "toning" the print a variety of tints and colours was obtained. This was really a process of intensifying, inasmuch as another metal was added to the image formed, and this clings in greater quantities to that part where the greatest deposit is, and adds to the shadows in greater proportion than to the half-tones and high lights. For the uranium toning Mr. Warren gave the following formula:—

No. 1.		
Uranium nitrate .....	48 grains.	
Glacial acetic acid .....	48 "	
Water .....	1 ounce.	

No. 2.		
Potassium ferridcyanide .....	48 grains.	
Water .....	1 ounce.	

No. 3.		
Ammonium sulphocyanide .....	280 grains.	
Water .....	1 ounce.	

One drachm of each of these was added to 12½ ounces of water, the print immersed until the desired tint was obtained, then rinsed in a five per cent. solution of acetic acid.

To obtain blue, or bluish-green tints, often useful for moonlight effects:—

No. 1.		
Ammoniated iron alum .....	¼ ounce.	
Hydrochloric acid .....	¼ "	
Water .....	2½ ounces.	

No. 2 and 3 solutions as above.

Take 5 parts No. 1, 2 parts No. 2, and 5 parts No. 3, with 1000 parts of water; immerse the print till the colour appears, then wash.

#### THE BARNET WORKS.

SINCE we last paid a visit to the works of Messrs. Elliott & Son, of Barnet, many changes have taken place in the nature of the firm's business. The branches devoted to dry plates, gelatino-chloride, and bromide-paper making have advanced by leaps and bounds, and it was in order to see for ourselves the additions to the manufacturing premises which this growth in trade had rendered necessary that, on a recent morning, we made our way to the little northern town which is the centre of so much photographic activity.

The situation of Messrs. Elliott's works is an ideal one for a business which, besides being devoted to the manufacture of sensitive photographic preparations, also embraces the production of many kinds of printing and enlarging. The buildings, situated at the rear of the town on its eastern side, overlook the hills and valleys towards Essex. From the very doors of the dry-plate and paper buildings the green panorama stretches away to the hazy distance, and one might imagine oneself not merely ten miles, but ten times the distance, removed from the centre of London. The air is crisp and invigorating, and it always seems to be sunny on these northern heights.

The inclusion of a large tract of ground adjoining their old premises, and situated at the very edge of this bracing, open country, has enabled Messrs. Elliott to erect two spacious factories, each situated well away from the other buildings, so as to minimise the risk of fire and at the same time leaving plenty of space in case future extension should be decided upon. The superficial area at the firm's disposal is so great, that one of the largest photographic manufactories in Great Britain, if not in the world, might easily be erected at Barnet.

About ninety hands are employed in the dry-plate building alone. Three coating machines are used, and, at the time of our visit, no less than eighteen of the staff were engaged in minutely examining the plates as they arrived from the drying-rooms. These chambers afford facilities for stacking several thousand dozens of plates at a time. Electric light is available in this building, and we note that, throughout, the non-actinic illuminant by which the work is conducted is of the "safest" kind—indeed, in this respect Messrs. Elliott carry caution to the utmost limits. The emulsion-making and cooking-rooms are exceedingly spacious, and are furnished with the latest appliances. A large experimental



laboratory, with every imaginable convenience for chemical work, excited our admiration.

The gelatine chloride paper has a building to itself. It is coated in 3000 feet lengths, and as it passes over the coating machine it is led up to the roof by an ingenious mechanical arrangement which carries it round and round the room in festoons. When dry it is converted into a roll and attached to the cutting machine—the first of its kind we have seen at work. This instrument, as the paper passes through, acts, as it were, like a series of scissors gauged to the required distances, and cuts the paper along its length, while it travels on towards a guillotine, which then cuts it across its breadth. This machine is a most valuable labour-saver. We are informed that there are not more than three of them in use in this country.

The examination and packing of the gelatine and bromide papers is conducted with as much care and caution as if they were dry plates, so that the sensitive coatings receive the maximum amount of protection from actinic light. Indeed, in every part of these spacious works, with their many ramifications, one sees evidence of the application of a thorough technical knowledge to the production of the plates and papers for which Messrs. Elliott are so widely and favourably known. Over a hundred and fifty hands are employed at the Barnet Works. It affords an interesting idea of the growth of the manufacturing business since our last visit to realise that the whole of the rooms then devoted to the production of the dry plates could be comfortably placed inside one of the many branches of the factory which have since been erected.

The Barnet plates and papers are, we are aware, well known and appreciated over seas, Messrs. Elliott having agencies in Japan, Australia, South Africa, &c. The popularity of these productions is well deserved, for, as we have often testified from personal trial, they are of the highest quality.

The rapid manner in which Messrs. Elliott's plate and paper business has grown is an eloquent commentary on the commonly uttered opinion that photography is not so much practised as heretofore. Photography is one of the necessities of modern existence, consequently the scope for industrial enterprise which it offers is practically illimitable. Such firms as Messrs. Elliott deserve all the success they achieve.

#### PHOTOGRAPHIC COPYRIGHT UNION.

THE Annual General Meeting of the Photographic Copyright Union was held on Tuesday evening last at the Café Royal, Regent-street, W. Mr. Frank Bishop occupied the chair, and among those present were Messrs. J. Lillie Mitchell, Alfred Ellis, William Grove, Bulmer Howell (Solicitor to the Union), Hubert Elliott, E. C. Elliott, Arthur Weston, W. Downey, Horatio Nelson King, Gerald Bishop, H. Gower (Secretary), H. H. Hay Cameron, Thomas Bedding, H. Snowden Ward, E. J. Wall, A. C. Brookes, and many others.

The Chairman, in the course of a few opening remarks, said that it had been decided in future to impose an annual subscription of half a guinea on membership of the Union. The system of relying on donations, and not insisting upon subscriptions, had not been found to work well. Referring to the Copyright Bill recently introduced into the House of Lords, and in connexion with which members of the Union and other gentlemen had given evidence, Mr. Bishop said the artists who had promoted that measure were evidently suffering from swollen heads; they unduly exalted the value of paintings, and depreciated that of photographs.

Mr. Mitchell read a letter from Mr. J. J. Elliott, regretting his inability to be present at the meeting owing to absence in the United States, and warmly commending the work of the Union. Mr. Elliott thought that every photographic society should join in the work of defeating the proposed Copyright Bill.

Mr. Bulmer Howell (Solicitor to the Union), in an interesting speech, characterised the Copyright Bill as a piece of spite on the part of artists. The terms of the Bill, according to Mr. Howell, were due to Mr. Bale, of the publishing firm of Cassell & Co., and Mr. T. E. Scrutton, the former counsel of the Union, was its draughtsman. Mr. Scrutton was said by Mr. Howell to have remarked in the lobby of the House that the Bill would "make photographers sit up." Mr. Howell advised the Union not to relax its efforts to defeat the Bill on its reintroduction, and suggested that kindred societies should be invited to join the Union in its work of opposition.

On the motion of Mr. Arthur Weston, seconded by Mr. E. C. Elliott, the report of the Committee, with a slight alteration, was adopted. We append a few extracts from the report:—

"It is gratifying to find that the photographic profession generally is now much more *au courant* with the details of the Copyright Act, and more alive to the protection of their rights and the many purposes, in addition to publication, to which photographs can be applied. Your Committee strongly advises all members to continue to register their published work, and any other photographs likely to be of general interest.

"During the year the attention of the Committee has been concentrated chiefly upon the consideration of Lord Monckswell's Copyright Bill, introduced to the House of Lords during this last session, and evidence has been given before the Select Committee of the House of Lords (to whom the Bill was

referred) by Mr. Bulmer Howell (Solicitor to the Union), and by Messrs. Joseph J. Elliott, Gambier Bolton, E. Frih, and J. Lillie Mitchell as representing the Union. The Committee attended also, by special invitation, the meetings of the Royal Photographic Society and the Camera Club to discuss the provisions relating to photography in the Bill, and strenuous opposition was offered both before the Select Committee and at these meetings to the proposed position of photography from its classification in the fine-art section, which position it rightly holds in the present law under the Bill of 1862.

"Continued watchfulness will be required by your Committee and by all interested in photographic copyright in connexion with the Bill that is to be introduced into Parliament next session.

"The exceptionally heavy working expenses of the Union during the past year, on account of legal work in connexion with Lord Monckswell's Bill have been duly met, but, many members having expressed their preference for an annual fixed subscription, instead of uncertain calls for contributions for the purpose of meeting expenses connected with the working of the Union, it was thought desirable to circulate the whole of the members as to their opinion on this important subject, and so satisfactory were the large number of replies received in favour of a fixed subscription, that your Committee now advocate a return to the original half-guinea membership fee, and this recommendation appears amongst the amendments to the Rules to be proposed.

"In accordance with Rule V., which requires two members of the Committee to retire by rotation, Messrs. Frank Bishop and William Grove are the retiring members, but these gentlemen offer themselves for re-election.

"As arranged at the last General Meeting, Mr. Thomas Bedding and Mr. H. H. Cameron have audited the accounts and certify the same are correct."

After further remarks from the chair, Mr. Downey, and other gentlemen, votes of thanks were passed to the Auditors, the President, and Committee, and the meeting closed.

#### LANTERN NIGHTS AT THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

DURING the course of the Exhibition there will be displays, by means of the optical lantern, every Monday, Wednesday, and Saturday evening as follows:—

Saturday, September 30.—"A Trip to Ireland." Arranged by Mr. C. H. Oakden (President of the South London Photographic Society).

Monday, October 2.—"Flower Studies," by J. Carpenter.

Wednesday, October 4.—"Tele-photographic Studies," by E. Marriage.

Saturday, October 7.—"A Trip to Paris, *via* Newhaven, Dieppe, and Rouen," by Algernon Brooker.

Monday, October 9, "Zoological and other Animal Studies," by Henry Sandland, J.P.

Wednesday, October 11.—"Beauties Old and New in the French Riviera," by S. J. Beckett.

Saturday, October 14.—"Mountaineering within the Arctic Circle," by Mrs. Main.

Monday, October 16.—"Travels in Italy, Spain, Algeria," &c., by H. Little.

Wednesday, October 18.—"A Holiday in North Wales," by J. A. Hodges.

Saturday, October 21.—"Bits by the Way," by E. Dockree; and "Byways of Italy," by J. C. Ashton.

Monday, October 23.—"North Country Life and Scenery," by E. G. Lee.

Wednesday, October 25.—"Olla Podrida," by Tom Bright.

Saturday, October 28.—"Lowestoft and Neighbourhood," by H. Vivian Hyde.

Monday, October 30.—"Surrey Commons, Ponds, and Rivers," &c., by T. M. Brownrigg.

Wednesday, November 1.—"Animal Studies," by Chas. Reid.

Saturday, November 4.—"Belgium Revisited," by W. D. Welford.

Monday, November 6.—"Some Beauty Spots of English Scenery," by J. A. Hodges.

Wednesday, November 8.—"Palestine," by P. R. Salmon.

Saturday, November 11.—"Lucerne and its Environs," by John H. Gear.

#### THE HACKNEY EXHIBITION.

We are requested to announce that the Hackney Photographic Society will hold its Annual Exhibition on Wednesday, Thursday, and Friday, November 15, 16, and 17, 1899. The Judges are to be Messrs. Harold Baker, A. Horsley Hinton, and J. B. B. Wellington, with, as Hanging Judges, Messrs. Alexander Mackie and H. Vivian Hyde.

The following are the Classes:—Members: (A) Portraiture, Figure, and Animal Studies. (B) Architecture. (C) Landscape, Seascapes, and River Scenery. (D) Hand-camera Work. (E) Set of four Lantern Slides. Open: (F) For Pictures which have not received an award at a Public Exhibition. (G) Portraiture and Genre. (H) Champion—for Pictures which have received an award at a Public Exhibition. (I) Set of four Lantern Slides which have not received an award at a Public Exhibition. (J) Champion—Set of four Lantern Slides which have received an award at a Public Exhibition. (K) Stereoscopic—Set of four Prints or of four Transparencies.



A silver and bronze medal will be awarded in all classes except c and h, in both of which a gold and silver medal will be awarded.

A special gold medal is offered for the best picture in the Members' Classes.

A silver medal will be awarded to the best trade exhibit, or for the most useful photographic article shown by either the trade or by any amateur.

Certificates will be awarded at the Judges' discretion.

Entry forms and all particulars may be obtained of the Hon. Secretary, Mr. W. Seife, 70, Paragon-road, Hackney, N.E.

### THE STAFFORDSHIRE EXHIBITION.

The following are the awards in the Photographic Section:—

Class 1 (Champion).—1. *Wanderers from the Path*, Mr. C. F. Inston, gold medal; 2. *At Twilight*, Mr. W. E. Dalglish, silver; 3. *Fruit*, Mr. J. M. Whitehead, bronze; 4. *North Choir Aisle, Ely*, Mr. E. B. Bull, bronze.

Class 2 (Landscape).—1. *Wanderers from the Path*, Mr. C. F. Inston, silver medal; 2. *At Twilight*, Mr. W. E. Dalglish, bronze; 3. *At Littleton, Sussex*, Viscount Maitland, diploma; 4. *A Moorland Sunset*, Mr. J. T. Charters, diploma; 5. *Winter*, Mr. H. Lewis, diploma.

Class 3 (Seascape).—1. *Sunset on the Forth*, Mr. W. J. Croall, silver medal; 2. *The Breaking Storm*, Mr. C. F. Inston, bronze; 3. *A Busy Corner*, Mr. L. West, diploma; 4. *Bare of All, &c.*, Dr. J. C. Saunders, diploma.

Class 4 (Portraiture).—1. *The Workshop*, Mr. Chas. Speight, silver medal; 2. *Waiting*, Mr. J. K. H. Crawford, bronze; 3. *Portrait*, Mr. Robert Ayton, diploma; 4. *Miss Ferguson*, Mr. W. J. Byrne, diploma.

Class 5 (Architecture).—1. *North Choir Aisle, Ely*, Mr. E. B. Bull, silver medal; 2. *Choir, Salisbury*, Mr. W. Howell, bronze; 3. *Behind the Great Screen, Winchester*, Mr. C. H. Oakden, diploma; 4. *Choir Aisle at Newark Church*, Mr. A. J. Loughton, diploma; 5. *North Choir Aisle, Ely*, Mr. E. H. Lamb, diploma.

Class 6 (Ladies).—1. *A Village Worthy*, Miss E. M. Grey, silver medal; 2. *Storm, Lake of Geneva*, Miss A. Baird, bronze.

Class 7.—Withheld.

Class 8 (Instantaneous).—(Silver medal withheld) 1. *A Close Finish*, Mr. C. M. Wane, bronze medal.

Class 9 (Flowers, Fruit, &c.).—1. *Fruit*, Mr. J. M. Whitehead, silver medal; 2. *Flower Study*, Miss Annie E. Blake, bronze.

Class 10.—Withheld.

Class 11 (Enlargements).—1. *Waiting*, Mr. J. K. H. Crawford, silver medal; 2. *The Breaking Storm*, Mr. C. F. Inston, bronze; 3. *Sunset on the Forth*, Mr. W. J. Croall, diploma.

Messrs. Thomas Mottershead (Longton) and Harry Wade (Manchester) were the Judges.

### EXHIBITION AT EXETER.

The first Exhibition of needlework, photography, chip-carving and decorative painting in connexion with the University Extension Guild, took place at the Albert Memorial College, Exeter, last week. A local contemporary says that, in regard to the photographic exhibits, the work of judging was most efficiently carried out by Mr. Chas. Rowe, of Torquay, whose awards gave entire satisfaction. The section, though small, indicated some interest in the special subject—architecture—to which this portion of the Exhibition was devoted. At the same time the treatment of each subject was in nearly every instance pictorial, which was perhaps, on the whole, not an unhappy incident. An architect, or a student in architecture, might find but little to help, but the general public and the photographer, who sought for hints, would find this section full of suggestions. One worker's contributions stood out clearly from the rest, in selection and in execution. Of this work the upright print in the frame 126 was clearly the best, and to this the first prize was awarded. Two prints were included in the frame (a very unwise method at any time), and both were studies of old houses in Tudor-street. Both would be worthy of a high place in a collection of photographic survey prints, of which the Exeter Photographic Society ought to produce a considerable number before the originals have passed away, and for the sake of a record being made of interesting and picturesque portions of the city, which, in the course of time, will naturally be removed. The second prize went to No. 147, an interior of St. James's Chapel, Exeter Cathedral. This differed entirely in style from the prints already referred to, and was an example of careful detail, admirably rendered and well printed. Evidently from the same exhibitor who took the premier position came some admirable studies of the sculpture on the west front of the Exeter Cathedral. These were, in a sense, sketchy and artistic, soft in quality and of good tone. Such studies are valuable to the archaeologist and to the lover of a picture equally, and reflect the greatest credit on their producer. *Exeter Cathedral Choir looking West* (No. 121), by Miss Gidley, was an example of fine detail work, and was commended. It was printed on a very unsuitable paper, and loses quality thereby. The remainder of the section does not call for much comment, the average was fairly good. One point is emphasised here and there,

and it is the fact that amateur photographers are afraid to cut down their prints in order to get good proportions and to add to the pictorial quality. It is a pity that photographic workers do not exercise greater care and thought in mounting as to colour and to framing. Many of the prints shown could have been seen to far better advantage if these points had been considered; prints should be framed singly.

## News and Notes.

PHOTOGRAPHIC CLUB.—October 4. Mr. Henry W. Bennett, F.R.P.S., on "Architectural Photography."

MESSRS. BENDER & Co., of 242, London-road, Croydon, have been awarded two first prizes for carbon and bromide enlargements in the South German Exhibition at Stuttgart.

AN esteemed correspondent in Paris writes: "How can living pictures of the trial at Rennes be shown when even pocket cameras were not allowed in the Court House? A mystery, is it not?"

A CHEAP edition, in sixpenny weekly parts, is about to be issued of *Cassell's Gazetteer of Great Britain and Ireland*. The work is very fully illustrated from authentic photographs, and will contain sixty maps in colours. Part I will be ready on October 4.

THE West London Photographic Society will, during the forthcoming season, cater for the needs of the beginner by holding a series of six lectures and demonstrations on elementary subjects, of which full particulars will shortly be announced. These beginners' meetings will alternate with the ordinary meetings of the Society.

A NEW weekly magazine will be issued early next month by Messrs. Cassell & Co., under the title of *Sunday Chimes*. It will be very fully illustrated and will aim at supplying for the day of rest matter as high in quality and as attractive in character as that provided for the week day by their very successful publication the *New Penny Magazine*.

THE Longton and District Photographic Society's Fourth Exhibition will be held in the Sutherland Technical Institute, Stone-road, Longton, from Monday, November 20, to Saturday, November 25, 1899. The following are the Open Classes: H, Pictures previously medalled, gold, silver, and bronze medals; J, pictures not previously medalled, silver and bronze medals; K, lantern slides (sets of six), silver and bronze medals. All entries and other communications to be addressed to the Hon. Secretary, Mr. Thomas Mottershead, 43, Stafford-street, Longton, Staff.

SANDELL "PERFECT" COMPETITIONS.—The following are the results of the August competitions:—101. prize, *The Rehearsal*, Mr. Thomas Knox, Belfast; 51. prize, two studies—*The Little Artist and Tired Out*, Mr. A. Darn, Wootton-under-Edge; 11. prizes, *Lady Chapel, Bristol Cathedral*, Mr. H. E. Brightman, Bristol; *Summer*, Mr. J. M. Nisbett, Horselydown; two studies—*In Earl's Colne Church and The Drawing Slate*, Mr. C. S. Tyler, Earl's Colne; two studies—"He cometh not," she said, and *Fly catching*, Mr. W. Shaw, Camberley; *Reading and Writing*, Mr. William McLean, Belfast; *Blowing from the Nor'-West*, Mr. Charles F. Inston, Liverpool; "I've lost my way," Miss H. Phillips, Colwyn Bay; two studies—*Choir and Altar and North Side Aisle, Christchurch Abbey*, Mr. H. W. R. Child, London; *Sunshine and Shade*, Mr. E. A. Salt, South Croydon; two studies—*In Lichfield Cathedral*, Mr. Edgar R. Ball, Forest Hill.

THE Borough Polytechnic Photographic Society open their winter season on Wednesday, October 4, with a popular lantern lecture by Mr. Thomas Fall, F.R.P.S., on "Photographic Experiences." This is the first of a series of monthly lectures of a popular photographic nature, which constitutes one of the features of this Society's programme. These lectures will be held at the Polytechnic, 103, Borough-road, S.E., on the first Wednesday of each month at 8.30 p.m. and will be open to the general public at a nominal charge for admission. In addition to a strong list of Wednesday lectures and demonstrations, a connected series of practical instruction evenings has been arranged for each Friday throughout the season. These meetings are under the supervision of a member appointed for the occasion, and are specially adapted for beginners and those contemplating taking up photography as a hobby. The first of these elementary instruction evenings will be held on October 6, subject, "Apparatus: the Principle of a Lens' Action; the Functions of Single, Rapid Rectilinear, and Wide-angle Lenses." The Hon. Secretary is Mr. P. C. Cornford, 103, Borough-road, S.E.

MESSRS. FUERST BROTHERS, of 17, Philpot-lane, London, E.C., are now in a position to offer the following film subjects: *Dreyfus Trial*.—1. *Meeting of the Council of War*: The lawyers, Messrs. Demange and Labori are conversing; Colonel Jouaust informs them that the meeting is about to begin; the Court enters, and the accused is brought in; the defendants demand a hearing for General Mercier, who comes in and gives evidence. 2. *Dreyfus in his Cell*: Seated by his wife, he convinces her of his innocence, and bids her hope; a police sergeant enters, and tells Madame Dreyfus that the time for her visit has expired; husband and wife embrace one another, and Dreyfus leads his wife to the door; entrance of the two lawyers for the defence, MM. Demange and Labori; Dreyfus asks them to be seated, and they begin to examine the dossier. 3. *Entrance of the Council of War*: Dreyfus crosses the road and enters the Council Chamber; the lawyers, MM. Demange and Labori, follow, carrying on an animated conversation; then come the witnesses, General Mercier and others, also Colonel Jouaust, President of the Council. 4. *Leaving the Council Chamber*: The witnesses, led by General Mercier; then Dreyfus, accompanied by a sergeant of police, followed by his lawyers, MM. Demange and Labori. Each film is sixty-five feet in length.



**AN EXTRAORDINARY CASE.**—On Thursday, at Bedale, Sir Henry B. Pierse, Bart., remanded two travelling photographers, named Frank Johns and William Henry Hammond, until Tuesday next on a charge of obtaining 3s. by false pretences from a boy named Fred Seafie, aged fourteen, at Masham, on the 20th inst. One of the prisoners had induced the boy Seafie to have a look round their photographic booth, saying it would cost him nothing. When he got inside, they seated him in a chair and told him that, if he did not keep quiet, the place would be blown up. They then took his photograph, and charged him 3s. for four copies. The boy, being frightened, paid the money to get out, and he then complained to Inspector Holmes, who arrested Hammond in the booth. Johnson absconded, but was traced to Tansfield, where he was apprehended by Sergeant Kemp.

The Birkenhead Photographic Association will hold an International Exhibition of photographic work on Tuesday, Wednesday, Thursday, Friday, and Saturday, April 3, 4, 5, 6, and 7, 1900, in the large buildings of the Y.M.C.A., Birkenhead. The Exhibition Secretaries are Messrs. C. F. Inston, 25, South John-street, Liverpool; S. Tagg, 32, Chestnut-grove, Birkenhead; T. J. Smith, 74, Prenton-road East, Birkenhead. The following are the classes: 1. Landscape (with or without figures), one silver-gilt medal, one silver, and one bronze. 2. Seascape and Marine, one silver, one bronze. 3. Portraiture and Genre, one silver-gilt, one silver, and one bronze. 4. Architecture (exterior and interior), one silver, one bronze. 5. Photo-mechanical, one silver. 6. Photo-micrography, one silver. 7. Stereoscopic work and Transparencies, one silver. 8. Hand camera work (sets of four prints in one frame—camera must have been held in the hand), one silver-gilt, one silver, one bronze. 9. Lantern slides (sets of six) (a) Slides that have previously received an award in open competition, silver-gilt; (b) slides that have never received an award in any open competition, one silver, one bronze. One solid gold medal will be awarded to the best picture in the Exhibition (classes 5, 6, and 7 excepted). One solid gold medal will be awarded to the best set of lantern slides in the Exhibition.

## Patent News.

The following applications for Patents were made between September 11 and September 16, 1899:—

**ANIMATED PHOTOGRAPHY.**—No. 13,294. "A Method of Showing a Series of Pictures in Animation." H. WHEELER.

**NEGATIVE PAPER (STRIPPING).**—No. 18,430. "A Negative Paper to be Drawn off." Complete specification. A. HOFMANN.

**COLOURING PHOTOGRAPHS.**—No. 18,594. "An Improved Process for Producing Coloured Photographic Pictures." B. KUNY.

**DIVIDING BEAMS OF LIGHT.**—No. 18,669. "Improvements in Means for Dividing Beams of Light for Photo-chromoscopic and other Purposes." E. S. SHEPHERD.

**CAMERAS.**—No. 18,681. "Improvements in or relating to Photographic Cameras." Complete specification. W. B. THOMPSON.

**FILMS.**—No. 18,738. "Improvements in or relating to Photographic Films." O. MOH.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
2.....	Camera Club.....	Opening of Exhibition of Pictures of the East, by E. R. Ashton.
2.....	South London.....	Pyro Soda Development. Ben E. Edwards.
3.....	Gospel Oak.....	Discussion: The Hand Camera, its Influence on Photography.
3.....	Hackney.....	Criticism. F. W. Gosling.
3.....	Redhill and District.....	Carbon Printing. J. O. Grant.
4.....	Croydon Camera Club.....	Short Address by the President, followed by a Demonstration.
4.....	Borough Polytechnic.....	Photographic Experiences. Thomas Fall, F.R.P.S.
4.....	Photographic Club.....	Architectural Photography. Henry W. Bennett, F.R.P.S.
5.....	Camera Club.....	Natural-colour Photography. E. Sanger Shepherd.
5.....	London and Provincial.....	Demonstration: Viol. T. Thorne Baker.
6.....	Borough Polytechnic.....	Elementary Instruction Evening: Apparatus: the Principle of a Lens' Action.
7.....	South London.....	Excursion: Chislehurst for St. Paul's Cray. Leader, W. F. Slater.

### ROYAL PHOTOGRAPHIC SOCIETY.

SEPTEMBER 26,—Technical Meeting.—Mr. Chapman Jones, F.I.C., F.C.S., in the chair.

#### APPARATUS AT THE EXHIBITION.

As usual at the first meeting of the Society after the opening of the Exhibition, the evening was devoted to the examination of the apparatus exhibited.

Messrs. G. HOUGHTON & SON'S representative explained the Sanderson Hand Camera, adapted for use in the hand or on a stand, and embodying the Sanderson universal swing front. The camera has a removable focussing screen with spring hood, a reversible back, view-finder, rack and pinion, and focussing scale, and is fitted with a Bausch & Lomb shutter working between the lenses, and giving speeds of from one second to one-hundredth of a second by hand or pneumatic release. The other exhibits of this firm were a camera, combining all the features of the Sanderson camera but at a more popular

price, and Lloyd's Rotary Trimmer, a very useful piece of apparatus in which the cutting edge is a wheel travelling along a fixed horizontal bar.

Mr. J. H. AGAR BAUGH explained the Biokam, exhibited by Messrs. John Wrench & Son, an apparatus consisting of a combined cinematograph and snap-shot camera, printer, projector, and enlarger, fitted with Voigtlander lenses for taking and projecting the pictures, and also the printing frame and developing tray for use therewith.

Mr. E. CLIFTON demonstrated the new model Dallmeyer hand camera (J. H. Dallmeyer, Ltd.), with long extension for use with lenses of the convertible type, and provided with rising and cross front, two brilliant finders, f-6 Stigmatic lens, and Bausch & Lomb Unicum shutter.

Messrs. W. WATSON & SONS' representative first explained the Gambler Bolton hand camera, designed for very rapid work and especially for studies of animals and yachts, and other long-distance work. It is fitted with a Thornton-Pickard focal-plane shutter with speed indicator, and can be used with dark slide, changing box, or roll-holder. One of its chief advantages is a full-sized finder, by means of which the image can be focused up to the moment of exposure, the pressure of a discharger causing a mirror to rise to the top of the camera and to automatically release the shutter. The apparatus, which is admirably adapted to the purposes for which it is intended to be used, has already been fully noticed in these columns. The binocular stereoscopic camera, resembling in size and appearance an ordinary field glass, was next described, its novel arrangement being that the lens is placed at the side of the instrument instead of in the front, so that the object photographed is at a right angle to the direction in which the operator is apparently looking. An accessory to this exhibit was a stereoscopic printing frame, obviating the necessity of dividing and transposing the negatives or positives. Messrs. Watson also showed the apparatus used in the Kromaz process of three-colour photography, comprising a frame containing a set of colour screens, a repeating holder for attachment to the camera and carrying the colour screens and dark slide, and a stereoscope for viewing the finished pictures. In this adaptation of the three-colour process only two pairs of negatives are taken, one pair through red and blue screens, and one pair through a green screen, and from the stereoscopic negatives so obtained positives are made, which, combined in the special chromo stereoscope, reproduce the object in its natural colours.

The TELLER CAMERA COMPANY, Ltd., exhibited the new and improved pattern of their well-known camera, which has already been noticed in these pages.

Mr. THOMAS WEBSTER showed a very ingenious book-form printing frame, designed to allow the whole of the picture to be seen at once, and adapted to printing either from plates or cut or rollable films. He also demonstrated a flashlight apparatus of extreme simplicity of construction, the magnesium powder being driven by a spring through the flame of three wax matches.

Mr. SANGER SHEPHERD exhibited a set of two-inch square trichromatic light filters for natural colour photography, adjusted for the Cadett Rapid Spectrum Plate by means of a modification of Captain Abney's colour sensitizer. He also showed examples of a simplified method of natural colour photography by trichromatic printing in transparent media, and a series of light filters for orthochromatic work on the Cadett Spectrum Plate. Mr. Cadett's Colour Sensitizer and Orthochromatic Plate Standardiser were briefly referred to by Mr. Sanger Shepherd, who also showed the spectrum plate "Safe Light."

Messrs. MARION & CO.'s exhibit included several ingenious contrivances, comprising the Massey Field and Studio Stand, a Perfect Developing Dish, Sectional Print-washer, Desk-trimmer, Soho Circular Print-trimmer, a new flat pocket-book form of the Hunter & Driffield Actinograph, a holder for supporting films during development, &c.; a tripod stay, to prevent slipping on smooth surfaces; a speed-testing printing frame, with six narrow shutters side by side for the exposure of a plate or print in strips; the Stereoscopic Swallow hand camera; and the Swallow hand camera for thirty quarter-plate cut films.

Mr. C. S. SOUTHN showed an adjustable vignetting apparatus. It consisted of two light frames of wood and metal, a lower or metal frame for attachment to the printing frame, and a top wood frame, carrying the vignetting card, capable of being raised or lowered to any angle or height by means of screwed studs and nuts and a spring.

Messrs. SPRATT BROTHERS described their long-focus light field cameras, which possess several novel and ingenious features.

Mr. J. Wheeler's metzograph screens and reticulated ruby glass were shown by his representative, and the exhibits of Messrs. J. E. Johnson & Co. (engraved screen plates), Kodak, Limited (Zenith and Kodak cameras), Messrs. Mackenzie & Co. (Daylight slide and Daylight camera), J. J. Griffin & Sons, Limited (Cyko camera and frame of curious effects with the Kachin developer), and the Secco Film Company, Limited (negatives on Secco films and prints from the same), were examined in the absence of the exhibitors.

Messrs. C. P. Goerz exhibited an apparatus capable of being used either as an opera-glass of two powers, magnifying two-and-a-half or three-and-a-half diameters, a twin-lens hand camera, or a stereoscopic hand camera, the size of the pictures being two inches by one and three-quarter inches.

#### COMING EVENTS.

October 10, Ordinary Meeting: the President will deliver his annual address, and will present the medals awarded at the Exhibition. October 17, Photo-mechanical Meeting. October 24, Technical Meetings; subjects to be announced.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 21,—Mr. R. Beckett in the chair.

The announcement of the death in Japan of Professor W. K. Burton was officially made, and it was agreed to record the deep regret which the members felt at the loss of one of the honorary members of the Association.

Mr. W. F. Slater passed round a copy of one of the groups taken in Belgium on the occasion of the recent excursion by the South London Society, in which several well-known photographers from different parts joined.



The question arose as to the arrangements for the annual outing to Hampstead in which this Association and the Photographic Club usually joined, and Mr. Freshwater was deputed to inquire as to suitable headquarters and report.

A copy of Penrose & Co.'s handsome annual was passed round by Mr. Slater for inspection. It was unanimously voted a very fine production, and was examined with much interest.

#### PHOTOGRAPHIC CLUB.

SEPTEMBER 20.—Mr. A. E. Staley in the chair.

Mr. E. W. FOXLEE, speaking upon the subject for discussion,

#### UNCORRECTED LENS WORK.

said that he had not worked much with the usual spectacle lens, but he knew and had seen much excellent work by them. He thought that in the old days such lenses were adopted much on the score of economy, and not from special appreciation of the results to be obtained. He pointed out that Steinheil's periscop was not corrected, and that it was issued with directions for adjustment. The lens used in the first Kodaks were uncorrected, but, the focus being fixed, allowance was made.

The CHAIRMAN said there were at present on the market several uncorrected lenses, and mentioned that fitted to one make of hand camera which was partly corrected—a wide-angle lens of some 120°, and cheaper than an ordinary wide-angle—Dollond's Monocle, and a German lens provided with a mechanical adjustment. Personally he was of opinion that such lenses were only used as a fad, seeing that it was now possible to obtain a whole-plate rapid rectilinear lens for 12s. 6d.

Mr. J. R. WILLIAMS, speaking of the type of camera fitted with such cheap lenses, mentioned that he knew that somebody was using a lens and camera of first class make to get specimen photographs for a 3s. 6d. hand camera.

Mr. FOXLEE said that he should also like to mention another side to the correction of a lens, *i.e.*, over-correction, and stated that Voigtlander's early Petzval lenses were all over-corrected, and that Voigtlander, while conforming to the demand for exactly corrected instruments, still adhered to the opinion that over correction was better for working. With this he agreed, and said he had bought a pair of *carte de-visite* Voigtlander lenses, which he had used for months before he found out, by testing a friend's lens on his own camera, that their foci were not identical.

**Hackney Photographic Society.**—September 19, Mr. W. Rawlings presiding.—In the course of the evening Mr. W. D. WELFORD read a paper on the subject of

#### EXHIBITIONS AND EXHIBITORS. [See page 618.]

A long and interesting discussion followed Mr. Welford's paper, in which the CHAIRMAN said that Mr. Welford had omitted to mention one advantage of exhibitions, *viz.*, that they formed good incentives for improvement. He quite agreed as to the inadvisability of competitive exhibitions, but he did not like the idea that an exhibitor should study the preferences of the particular Judges who were to judge his work. On the contrary, let each man show the best he could do and ignore the possible fancies of the Judges. On the subject of faking, he thought that a limit should be made and the line be drawn at extensive working up of the print. With the exception, perhaps, of mounting and framing, all the work should be the exhibitor's own. Mr. R. BRACKETT thought that a great improvement could be made in the judging. Judges ought to give the reason for their awards, and so make the Exhibition of much greater value both to successful and non-successful exhibitors. The system of exhibiting work only partly done by the exhibitor was a great abuse. The man who did the work ought to get the credit of it, instead of which exhibitors often got credit for work which was not their own. Concerning medals in members' classes, he thought that no friction ought to be caused by it. Mr. FARMER had known cases where Judges' decisions had caused discontent, but not in one member against another. Personally he was strongly against the practice of giving medals, and thought that the honour of having one's pictures selected for exhibition should be sufficient reward. He thought that work shown should be entirely the exhibitor's own, with the exception of framing. Messrs. W. L. BARKER and ROOFER and several other members expressed the opinion that medals encouraged many to exhibit who would not do so otherwise. Mr. HENSLEY said he would prefer to exhibit where no medals were offered. A good selection committee should be chosen and reliance be placed in it. In such a case he would consider the honour of having his picture accepted sufficient. This plan would, however, be found difficult to work in the case of a small society exhibition. Mr. FARMER thought that some refrained from exhibiting through fear that their work would not receive an award, and consequently would suffer in comparison with medalled pictures. If no medals were awarded, all would be placed on an equality, and it might be the means of inducing diffident ones to exhibit. After others had spoken, Mr. WELFORD replied. He agreed with the Chairman that an exhibition was an incentive to good work. He had advised exhibitors to study the tastes of the Judges, because he considered that there was no use in a man forcing his prints on a Judge who, he knew, would not care for them. On the subject of faking, he thought it did not matter whether the work was put on the negative or the print, or, indeed, where it was put, so long as it passed the Judges. It was a very difficult matter to draw the line as to where faking should begin or end.

#### FORTHCOMING EXHIBITIONS.

1899.

Sept. 29-Nov. 4 ..... Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.

Sept. 29-Nov. 11..... Royal Photographic Society. Hon. Secretary, Major-General Waterhouse, 66, Russell-square, W.C.

October 11 ..... Ludlow Photographic Society. Hon. Secretary, 14, Mill-street, Ludlow.

„ 18-24 ..... Croydon Camera Club. Hon. Secretary, W. H. Rogers, 106, Holmesdale-road, South Norwood.

„ 22-Nov. 19... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.

Nov. 27-Dec. 18 ..... American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.

December 7-9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.

„ 11-Jan. 1900 Huddersfield (Invitation). W. A. Beavers, Cloth Hall-street, Huddersfield.

„ 27-30 ..... Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### THE R.P.S. EXHIBITION.

To the EDITORS.

GENTLEMEN,—I have refrained from making any reply to the numerous paragraphs respecting the Judges elected to award the medals at the R.P.S. Exhibition until our work was completed. Now, I ask you, in common fairness, to give this letter the same publicity as your attacks. You describe the Selecting Committee of last year as “a humiliating spectacle of the organizers of a rival and unfriendly Exhibition . . . having a finger in the pie of the one great representative Exhibition;” but you do not point out that there was no one present who was not a member of the Society. It is true that there were three members present who were also members of the Salon, but two were Fellows of the R.P.S. (one of these two being a member of the Council), while the third had been elected a member of the Hanging Committee by the Council itself.

Where did the humiliation come in?

You also speak of the “greatest dissatisfaction” with some of the awards of last year; yet, out of twenty-five names nominated by the members for Judges, four out of the five who acted in 1898 were re-elected for 1899, and the fifth was appointed by the Council as a member of the Selection Committee.

This year we have had a humiliating spectacle indeed! The Judges elected by the members to carry out a difficult and thankless task, have been treated by the R.P.S. and by your JOURNAL in a manner unparalleled in my experience. The Council, by a new departure, excluded the Judges from the Selection Committee. Not only was this exclusion carried out without any notice to the Judges, but this discourtesy was rendered more marked and intentional by the fact that answers to letters of inquiry from two of the Judges were withheld until a paragraph referring to the correspondence had appeared in your JOURNAL. This JOURNAL is conducted by a member of the R.P.S. Council.

This semi-official paragraph has been followed up by a series of others, which insult and bully the Judges lest the awards should not please the Editor of THE BRITISH JOURNAL, who assumes to take up a position of pharisaical impartiality.

Had I consulted my own feelings I should have at once resigned the office of Judge, but the time was too short to submit the matter to the general body of the members, and, in order to mark my sense of the treatment of the Judges, I have withdrawn from membership of the Society.—I am, yours, &c.,

HAROLD BAKER.

58, New-street, Birmingham, September 21, 1899.

#### THE STEINHEIL LENSES.

To the EDITORS.

GENTLEMEN,—I am sorry I am unable to supply Mr. Jourdain with the information he seeks. I am not a manufacturing optician, and am not acquainted with the methods of calculation followed by those who work out their lenses mathematically. But Mr. Jourdain may find much



interesting information upon this point by a study of Steinheil & Voit's work, *Grosses Handbuch der angewandten Optik*, of which, unfortunately, only the first volume was completed before Adolf Steinheil's death. Dr. E. Schröder's work, *Die Elemente der Photographischen Optik*, should also be of service.—I am, yours, &c., P. EVERITT.  
London, September 25, 1899.

## THE USE OF NETTING IN PORTRAIT PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—Seeing your remark in the JOURNAL about using a screen before the plate in taking a photograph, I thought I would send you a specimen of one I did some months ago, finishing it with the pen and Indian ink.

The screen, I must tell you, was from a piece of fine veil net, and, had I have taken a larger piece, the result would have been finer by reducing, which I think would have been an improvement in so small a photograph.

I trust the enclosed will be of some interest to you.—I am, yours, &c., D. J. SCOTT.

Camden Studio (adjoining New Theatre), Cambridge, September 25, 1899.

## OPERATORS' SALARIES IN NEW YORK.

To the Editors.

GENTLEMEN,—In reference to your column, Answers to Correspondents: "F. N." wishes to know something about operators' salaries in New York City. For first-class operators at the leading studios the principal one receives from \$30 to \$45 per week; assistants, from eighteen to twenty-five, according to ability. In the medium class of business, where one only is engaged, their salary runs from \$15 to \$25 per week. Respecting qualifications, the editor's ideas are about correct. In the first-class houses the principal operators are expected to keep well posted on the latest novelties in their line, and must be quick and obliging, and a main point is temperance. The rush of work, generally speaking, is from November 1 to about first week in January, then business falls off until about March 1, and after that date booms along until about the middle of July; then very quiet until fall again.—I am, yours, &c., T. F. PIMLOTT.

Bay State Photo Co., The Bridge, Lynn, September 23, 1899.

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

LENS FOR COPYING.—A. McFEN says: "I have a whole-plate portrait lens and a whole-plate rapid rectilinear, both excellent lenses. Which would you advise me to use when copying up to the whole-plate size?"—The rapid rectilinear, because with it the field will be more evenly illuminated than with the portrait combination.

MOUNTING, &c.—R. L. E. says: "Please tell me the best paper for backing enamel, and the best mountant to use for gelatino-chloride photographs."—Any stout, hard paper will answer. A special backing paper, for the purpose, is sold by most photographic dealers. Starch paste is as good as anything as a mountant.

ADDRESS WANTED.—SOUTHPORT asks: "Could you give me the address of Messrs. Johannet et Cie., makers of drawing and tracing papers, &c., or the address of their wholesale agents in this country, if they have one?"—We are sorry we cannot supply the desired address. In all probability the paper may be had through any dealer in artists' material.

COLLOTYPE PLATES.—LITHO writes: "Can you tell me where I can buy collotype plates sensitised ready for printing from the negative? I have lithographic presses, and, if I get the plates ready-sensitised, I think I can soon be able to work the process, as I expect litho presses will answer for the purpose?"—Collotype plates are not articles of commerce. They have to be used within a few hours—or a day or two—of their preparation. A lithographic press will answer for the printing.

SALTED PAPER PRINTS, RESIDUES.—WET PLATE asks: "1. Are printing-out prints on salted paper permanent when toned and fixed like P.O.P.? 2. Will refiners buy residues containing silver, iron developer, and cyanide mixed? I know it is recommended to keep the cyanide and iron separate; but it is very difficult to do so."—1. They will be about equal in permanency, we should say—perhaps more permanent. 2. A refiner will reduce the residue for you and allow for the silver, according to its assay.

DRYING CARBON TISSUES.—S. PRIDDER says: "Kindly give me your opinion of the enclosed sketch of a cupboard I propose having made for drying carbon tissue after sensitising it. The sketch is made on a scale of about one inch to the foot."—The design for the cupboard is very good, but the sketch shows that the fumes from the burning gas would go into the closet, and they would cause the tissue to become insoluble. The fumes of the gas must not be allowed to enter the chamber.

UNEVEN TONING.—E. BALLARD writes: "Enclosed please find some collodio-chloride prints. You will see there are some streaks across them that are unequal in tone. They were kept in constant motion while they were toning, and the bath was the sulphocyanide, made according to the formula issued with the paper. Can you tell me the cause of the trouble and its remedy?"—The cause of the trouble is the unevenness in the coating of the paper. That being the case, there is no remedy for it.

DRIED ALBUMEN.—J. B. COULTER inquires: "Where shall I be able to purchase some dried albumen, which I want particularly for some experiments? I have inquired at two photographic dealers and three or four druggists, and none of them keep it. Some even told me there was no such thing."—Dried albumen may be had from such houses as Hopkins & Williams, Mawson & Swan, &c. It is also kept by some druggists, who make a feature of dyers' materials. There are two kinds, egg albumen and blood albumen, the former the more expensive of the two.

PARTNERSHIP.—NEMO says: "A and B go into partnership and take premises at J, the firm paying rent, rates and taxes. A rents part of the house from the firm A & B. The part occupied by the firm and the portion A rents from it are about equal in area. Is not the business half of premises more valuable than the private dwelling part, i.e., from a business point of view should I not the business pay the greatest share of rent, rates and taxes, &c.?"—In most cases the business portion of the premises would be worth the most; in some not. All depends upon circumstances. Such matters are usually arranged by the partners between themselves to their mutual satisfaction.

CURING HALATION.—OPERATOR says: "Kindly inform me if there is any method of removing halation after development, such as occurs in photographing interiors. I do not mean the reducing of density with ferricyanide of potassium or mechanical means. I am told, of course by an employer, that some of my predecessors have done this. The plates have been backed, and strong sunshine through the windows when the exposures were made. Under the conditions, do you think it possible to remove the halation after development? I am satisfied about the matter, but would like an answer through your JOURNAL."—Certainly, the halation can be reduced. The most general way is to rub it down with a small pledger of wash-leather moistened with alcohol.

DEVELOPING AFTER FIXING.—VARNA says: "Dr. Neuberg's experiments, 'Developing after Fixing,' THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1899, p. 980. 1. Exposure (same), 2, 6, 14, and 30 seconds (for ordinary development proper time about  $\frac{1}{2}$  second), then fixed, washed, but without drying, put into developer. Contrary to expectation, positive image began to appear in 10 to 15 minutes, and all was well out in  $\frac{1}{2}$  hour, but left film in developer over night, say 8 hours in all; then mercury chlorate bath followed by sulphate of soda. Result, as per negative enclosed: longest exposure about right; short ones, no good. Dense, however, and almost impossible to print from. Second film, 32 seconds (proper time  $\frac{1}{2}$  seconds), proceeded as before, save that part 1 was put in chlorate mercury bath about  $\frac{1}{2}$  hour after the positive image came out, and all the operations after fixing were finished within 2 hours. Part 2 was left in developer for an extra 2 hours, and then the other operations as before. Part 1 was spoiled from silver (?) spots owing to inattention, and prints so-so, but might be better with intensification. Part 2 is dense enough and to spare, and seems to have undergone partial reversal in sky at least like the longest exposed part of first film. Part 3 (not sent), of the same second film I left to dry after fixing and washing for about 5 hours, and then put it in the old developer which had served for the two first portions of the film. No image appearing after 15-18 hours, used fresh solution, when a faint trace, but with no details, came out. Have any further authoritative experiments been carried out on these lines? The process seems to offer advantages in the case of known extreme over-exposures, and for cut and roll films when they cannot be properly developed at once. Two trials are not sufficient to draw any deductions, but it would seem that very long exposures are required, at least 30 times normal; that if developed just after fixing the positive comes out quickly, and should not, after all is out, be left to lie more than 1-1 $\frac{1}{2}$  hours in the developer; that drying decreases the sensibility. 2. Metabisulphate of potash is recommended as a preservative of pyro in place of sulphate of soda, seemingly in the proportion of 1 grain of the former to 6-8 of the latter. Can the metabisulphite of potash be used indifferently with all the developers, metol, quinol, &c., or does it then work differently, as with pyro? In THE BRITISH JOURNAL OF PHOTOGRAPHY ALMANAC for 1894, p. 1266, E. H. Hardy, of Sheffield, advertised (3) an 'Exposing and Developing Easel' for enlargements, &c., the exposure given and developer applied *in situ*; if exposure not sufficient, the process was repeated. The advertisement was not repeated, but I should be glad to know if the process is really practical; and, if so, whether these easels are still to be had. I cannot trust the local joints to do even so simple a thing.—1. We know nothing more of the method than was given by the author in his paper. We should recommend our correspondent to experiment further with it, as his results are interesting, and, as he says, his two trials are not sufficient upon which to form a judgment. 2. It may be used with some of the other developers as with pyro, though not so satisfactorily with all. 3. We do not know if the easel is still on the market. The thing is quite practicable, but the system is very seldom followed in this country, at least by practical workers.



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## THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1900.

Edited by THOMAS BEDDING, F.R.P.S.

THE thirty-ninth annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1 next. Its preparation is already receiving attention. This year's ALMANAC reached a total of 1508 pages, and the entire edition of 20,500 copies was sold out within about three months of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past ALMANACS have been received is the surest proof that the lines upon which that publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1900. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the ALMANAC in directions which may occur to our readers as susceptible of improvement.

The ALMANAC for 1900 will appeal to photographers all the world over as a daily reference guide in practical work. The

formulae will be revised where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages of the 1900 ALMANAC. Those of our friends intending to co-operate with us in this respect will oblige us by letting us have their MS., sketches, &c., at the earliest possible date.

Secretaries of societies will also oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us as early as possible.

The publishers ask us to remind advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

## EX CATHEDRÂ.

OUR enterprising contemporary the *Stage* (probably the best theatrical paper published) is offering to supply its readers with an enlarged portrait copied from any photograph, and finished in black and white, size 30 x 22 inches, for the price of 12s. 6d. We have no doubt many members of the theatrical profession will take advantage of this offer. The price is somewhat low, it is true, but we congratulate our contemporary upon its honesty in refraining from the practice, only too common amongst newspapers in all parts of the country in recent times, of saying that these cheap-worked up bromide enlargements were worth "so many guineas," or that the purchaser was getting for shillings what a photographer should charge pounds for.

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THE Annual Meeting of the Photographic Copyright Union, which we briefly reported last week, was characterised by una-



nimity of opposition on the part of those present to the copyright Bill which was introduced to the House of Lords last session. That Bill, it will be recollected, shared the fate of many other legislative innocents and was dropped in August. We believe it is to be reintroduced next session, and we hope that it will be drafted in terms less unjust to photographers than those which distinguished the original measure, than which, we do not shrink from saying, Parliament has never been asked to sanction a greater piece of spoliation. For many years it has been said of painters that they were jealous of photography, but the remark always seemed to us as having more of the jest than earnestness in it. But, after all, how painfully true it is, for it is a handful of St. John's Wood painters, backed up by a big publishing house, which is seeking to rob the photographer of that protection in his own work which Parliament gave him thirty-seven years ago.

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The Copyright Union has many enemies even amongst photographers; but not one of the latter can deny that in organizing evidence in opposition to the Bill, which was considered in Select Committee of the House of Lords earlier in the year, an enormous service was rendered by the Union to the interests of British photography. That evidence was voluminous and minute; it came from the leading men of the profession, and it should go far towards convincing Lord Monckswell, who was the sponsor of the Bill, that the painters and others who are behind the measure have gone out of their way, while looking after their own interests (which, so far as we know, have not been assailed) to spitefully and unreasonably seek to injure photography. For this work the Copyright Union deserves the thanks of every photographer, amateur or professional.

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In all probability the Union will be called upon to maintain a defensive attitude next session, when the Bill is reintroduced. It is too much to hope or to expect that the whole of the hatred and jealousy which the painters and their publishing friends have manifested towards photography and photographers will give place to a feeling of benevolent affection during the winter months. We may safely assume that there will be more hole-and-corner meetings at St. John's Wood; a new Bill will be drafted by Mr. Scrutton, and we may be sure, to quote Mr. Bulmer Howell's last week's reference, one more effort will be made "to make photographers sit up"—in other words, if not to rob them of legislative protection for their own handiwork, at least so to whittle away or qualify the rights conferred by the Act of 1862, that what remained would be practically valueless. We have read and re-read and carefully studied those parts of Lord Monckswell's Bill which concerns itself with photographic copyright, and are of opinion that, if the Bill passed into law in its old form, it would baffle the wit of man to interpret some of its clauses, particularly that which seeks to regulate the relations of artist and photographer.

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HOWEVER, the Bill is dead, and no useful purpose can be served by again discussing its provisions; this we did fully and exhaustively last summer. We can only conjecture that the new Bill, whatever its intentions towards photographic copyright may be, will require watchful criticism and perhaps opposition. The work performed by the Copyright Union a

few months ago in organizing evidence will, no doubt, be continued next session. In the mean time it should be known that the Union has already been put to considerable expense in the matter, and we certainly think the time has arrived when the means for raising the funds to carry on its work should be revised. Hitherto membership of the Union has entailed no subscription; donations have come from a mere handful of supporters; the general body of photographers has contributed little or nothing. In future there is to be an annual subscription of half a guinea, and, if only to fight the painters and others who are seeking to rob photography of its legislative rights, and degrade it from its place among the fine arts to the level of bricklaying, we hope that there will be a generous response to the efforts of the Committee to make the Union self-supporting.

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DURING the winter we understand that steps will also be taken by the Union to organize collective opposition to the attempt of the painters and publishers to interfere with the existing law of copyright as it affects photography. That law has been found to work excellently in practice, and it makes no inroads on the rights of either painters or publishers. The whole of the photographic societies of Great Britain, numbering many thousands of photographers, amateur and professional, are to be invited to support the Union in defending the existing law of copyright from attack. We trust that the societies, when appealed to, will co-operate with the Union in this matter, so that, if a new Bill is introduced into the Lords which contains provisions unfavourable to photographic copyright, a great weight of adverse opinion will be available. Painters and publishers are already well protected by law in their respective rights, but why should productions in printers' ink and oil colour enjoy the special favour of the legislature, and photographic impressions in silver, carbon, or platinum, be specially singled out for depreciation in value, as the dropped Bill undoubtedly meant them to be?

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A CONTEMPORARY has a note on some experiments of Professor Spring, in preparing optically pure water. It is pointed out that such water cannot be obtained by distillation, nor by filtration, these processes having no tendency to purify water optically, but often rather the contrary. Optically pure water can be obtained by the action of a weak high-tension current on water which contains suspended matter, or by sedimentation of colloidal precipitates, such as aluminium, ferric, &c., hydroxides, or by filtration of the water through colloidal precipitates. Crystalline precipitates, such as calcium oxalate, have little or no effect, nor can organic liquids be purified by colloidal precipitation. Spring believes that the illumination of the water is probably not caused by the dust itself, but by minute bubbles, which adhere to the dust particles. These occasion different colours, in which red and orange predominate, and hence the blue colour of natural waters cannot be due to a selective absorption on the part of the suspended matter.

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THE Champion Class at the forthcoming Croydon Camera Club's Exhibition not having sufficient entries to fill the allotted space, the Club has extended the date of entry until Tuesday, October 10, on or before which date all entries for



the Champion Class (gold medal) must be sent in frames to the Club rooms, 106, George-street, Croydon. Entry forms to the Hon. Secretary, Mr. W. H. Rogers, 106, Holmesdale-road, South Norwood, from whom forms and other particulars are obtainable.

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THE *Daily Chronicle* notes that a few weeks before the recess Sir Benjamin Stone, M.P., was busily engaged with his camera at the Houses of Parliament and the Tower of London. More recently he has turned his attention to the Guildhall, where he has been engaged for many days in photographing some of the most interesting documents bearing upon important events in English history. Sir Benjamin intends making a literal translation of the most valuable of the documents, among which are several well-known Norman charters, and the one granted by William the Conqueror to the City. After the recess Sir Benjamin intends revisiting the Guildhall and directing his attention to the librarian's department.

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BALLOON photography is expected to play an important part in the war that seems certain to break out between the Boers and the British. A military writer says that the captive war balloon, having taken a stationary position, eight cameras and lenses, spread round the balloon at equal distances, will enable a complete view of the surrounding country and enemy's camp to be photographed, and subsequently examined and discussed by the General commanding at leisure.

### ACETYLENE.

CONTINUOUS study is being made of the new illuminant, and to such an extent that eventually it is bound to occupy a position of the greatest importance. Meanwhile, however, the fire insurance offices continue to throw in the way of would-be users difficulties of a harassing and obstructive character. It has unfortunately happened that explosions of the gas have occurred, and naturally the companies, having no practical acquaintance with the matter, set their face against the "new-fangled" process, and will have none of it if they can so arrange. However, coal gas had to face much opposition at its first introduction, and in the present instance the natural conservatism of human nature is intensified by a fear of interference with dividends.

In the early stages of experiments with acetylene it was seen that an important factor of safety lay in the production of as pure a gas as possible, and to this end it is that so many experimentalists have been directing their attention, their various plans being the subject of mutual discussion. The impurities whose presence is hurtful fall into two divisions—those arising from impurities in the raw material, and those produced during the electric fusion. In the former category occur phosphoretted and sulphuretted hydrogen, while ammonia and cyanogen compounds would fall into the latter. Their danger lies in their liability to produce explosive compounds with the metal of the fittings or of the storage tanks, and the tendency in some cases to initiate spontaneous combustion.

With regard to the methods of purifying the acetylene by removing these injurious bodies, those most discussed recently are Luder and Cederkrutz's method improved by Dr. Wolff—the oxidation of the impurities by chloride of lime—or Frank's, consisting of the use of acid saline solutions to absorb them,

the ammonia being neutralised by the acid, the phosphoretted hydrogen absorbed, and the sulphuretted hydrogen precipitated as metallic sulphite. The use of acid saline solutions is said by Dr. Wolff to have great drawbacks; but its inventor states that it is by no means necessary to employ liquids, as the materials can be used to impregnate porous bodies such as Kieselguhr, a method suitable for a plant of small size. The latter writer points out that acid saline solutions are not, as stated, liable to cause explosions through the formation of acetylide of copper, the copper being precipitated as sulphide long before the whole of the acid is neutralised by the ammonia, even if the latter is present in large quantities (from 0.05 to 0.15 per cent. by volume being the proportion shown by a large number of experiments).

The purifying material is a very acid solution of cuprous chloride, or an acid solution of ferric chloride of known strength. One kilo of the latter suffices to purify seven to ten cubic metres of acetylene, or eighteen to twenty-five if the copper solution is used. An advantage in using the latter method is found in the fact that the copper solution can be regenerated by simple boiling and the addition of a little extra solution to make up for the copper thrown down as phosphide. Herr Christian Göttig draws the conclusion that the absorption of phosphoretted hydrogen by easily reducible metallic salts is increased by the presence of an alkaline chloride, whilst the need of using acids to prevent the formation of explosive acetylene metallic compounds is avoided.

With regard to this acetylide, the [danger of which is admitted on all hands, mention may be made of Herrn Freund and Mai's experiments. They found that, when dried at 50 to 60° C., and placed in a tube through which acetylene is passed, it explodes after a short time, but does not cause the explosion of the acetylene itself; while, before the explosiveness is developed, the acetylide must have been exposed to the action of oxygen or air while drying.

In the practical use of acetylene one grave source of danger is the after-formation of gas in the generators when the carbide has been removed from contact with the water. Dr. Wolff has measured the quantity thus generated from one kilo of carbide when, firstly, pure water was employed, and, secondly, when the carbide reservoir was over petroleum. The results were in the latter case 0.25 litres at the end of half an hour, 6 litres at the end of twenty-four hours, and 16 litres after three days, no more being then given off. In the case of water the numbers were respectively 7.25, 25, and 30 litres, but the carbide still went on decomposing at the rate of 5 to 6 litres a day. It is thus seen that great risks of explosion occur with small generators, with table lamps in particular. In large apparatus it can be avoided by the use of a sufficiently large reservoir to hold the excess of gas without undue compression. One means suggested for avoiding this constant discharge is the use of a layer of petroleum on the water, but it is open to the objection that a thin layer does not prevent evaporation of water, while with a thicker layer the probability is that it would be absorbed by the carbide, which would then be rendered impervious by water.

It will be seen from this brief account of work that the problem of safety in the use of acetylene illumination is being attacked from all sides, and there is fair ground to hope that eventually we shall have methods available which shall render the use of this most valuable illuminant as safe as the familiar coal gas.



**Lenses for an Astronomical Camera.**—It is stated in the *Scientific American*, that Mr. J. A. Brashear has just completed one of the pair of large astronomical camera doublets for the observatory of the University of Heidelberg, Germany. They are next to the largest ever made. They are sixteen inches clear aperture and eighty inches focal length. Two of these doublets, each consisting of four lenses, are to be made, and are to be used almost exclusively for the photographic discovery of asteroids. The reasons for making two cameras and objectives is to serve as a check. The track of an asteroid on an 8x10 plate is only about one-twentieth of an inch long for a three hours' exposure. As the curves of the lenses have necessarily to be very deep, the casting of the great discs was found to be very troublesome. The fund for the equipment was given by Miss Catherine Bruce, of New York.

**Igniting a Jet of Hydrogen.**—In the *Journal* of the American Chemical Society Mr. C. G. Hopkins describes a method by which a jet of recently generated hydrogen can be ignited with absolute safety and without loss of time. As soon as the action begins, collect the escaping gas in a test tube, and, when the latter is thought to be full of pure gas, remove it two or three feet from the generator and ignite the hydrogen in it; then immediately attempt to light the jet of hydrogen with the hydrogen flame contained in the test tube. If the gas is explosive, it will explode in the test tube, and leave no flame. If, on the other hand, a flame remains in the test tube with which the jet can be ignited, it is certain that the gas in the generator is no longer explosive. By adopting the precaution, therefore, of never lighting the hydrogen jet except with the hydrogen flame obtained as described above absolute safety can be ensured. Attempts may be made to ignite, the jet by this method as often as thought proper, and, if the hydrogen is properly generated, the gas will be ignited in less than a minute.

**Indecent or Classical.**—It has always been a somewhat vexed question, in proceedings under Lord Campbell's Act, as to where the "classical" ends and indecency begins, and probably ever will be. At the Southwark Police-court, one day last week, two showmen, after a remand, were committed for trial for showing studies in the nude in the cinematograph, alleged to be indecent; but Mr. Paul Taylor, the magistrate, remarked that he thought they were classical, but, at the same time, he said that the exhibition of one film, in conjunction with the language said to have been used, was indecent. As the prisoners stand committed for trial, on bail, it will be interesting to see how a jury will look upon the question? It has, if we mistake not, been decided more than once, some years ago, that a photograph of a painting of nude figures is not an indecent picture; whereas the same subject as depicted in the painting, when arranged with models, and photographed from life, was indecent. As we have just said, it had to draw the line as to where the classical ends and the indecent begins, as so much depends upon collateral circumstances.

**Cyanide of Potassium Poisoning.**—An inquest was held on Saturday on the body of a man who committed suicide by drinking a solution of cyanide of potassium. Since the cyanide has been but little used in photography, we have heard of few suicides by this poison, though the evidence showed in this case that the cyanide, a quarter of an ounce, was supplied by a chemist for alleged photographic purposes, and the poisons book was signed in the ordinary way. Photographic dealers, under the Poisons Act, are not allowed to sell cyanide of potassium, and a quarter of an ounce does not go far in photography; but we question if any photographic dealer would have supplied so small a quantity as that without having his suspicions aroused as to the purpose to which it would be applied. At the inquest it was stated that the quantity taken was sufficient to kill ten men. If it was, it was of quite a different quality from what we once got from a pharmaceutical chemist who supplied photographic materials, for we doubt if there was sufficient cyanide in a quarter of an ounce to kill one person.

**The Royal Arms Question Again.**—Last week a coal merchant was proceeded against, at the Clerkenwell Police-court, for using the Royal Arms without being entitled to do so, and was fined ten pounds, with three guineas costs. The proceedings were instituted by the Incorporated Association of Her Majesty's and other Royal Warrant-holders (Limited), "for assuming or using, in connexion with his calling, the Royal Arms, or arms so nearly resembling the same as to be calculated to lead other persons to believe that he was carrying on his business under the authority of Her Majesty, or any of the Royal family, or of any Government Department, he not having such authority." We quote the terms upon which the summons was granted in full, because, as we have said before, the law on the subject is very comprehensive, and we know that many photographers are, at present, infringing it, perhaps unwittingly. Some may not be aware that it is an offence to use, without the necessary warrant, the Arms of any of the Royal family, though we know that many do, simply on the strength that they may, at some time or other, have supplied photographs to them, and, possibly, on many occasions. However, that in no way entitles them to use their Arms, and, if they do so, they must expect, if proceeded against, to be mulcted in a heavy fine and costs. It is for this reason that we once more refer to the illegal use of the Royal Arms, though the prosecution alluded to had no connexion whatever with any one connected with photography.

**Kew Bridge.**—On former occasions we have referred to the removal of the old Kew Bridge to make room for a new one, which is sadly needed, and recommend those who wish to secure views of Strand-on-the-Green with the bridge as a background—and it forms an excellent one—to lose no time in obtaining them. We refer to the matter once more, as we read that the temporary bridge, on the other side from Strand-on-the-Green, will be open for traffic in a week or two, and the demolition of the old one will be commenced forthwith; so it will be seen that no time is to be lost by those desirous of securing pictures of this happy hunting-ground of artists, looking up the river. The old bridge has no great pictorial claims in itself, but it serves, as we have said, as an admirable background to several charming pictures. Strand-on-the-Green will, we hear, shortly lose much of its picturesqueness by "improvement" of the embankment, and the removal of several of the old cottages, which are said to be unhealthy. It may be mentioned that the best pictures of this spot, looking up the river, are to be obtained before noon or a very little after.

**Restoration of Bath Abbey.**—At a meeting, presided over by the Earl of Cork and Orrery on Friday last, it was resolved to proceed at once with the restoration of the west front of Bath Abbey, the cost of which, it is estimated by the architect, will come to something like 2000*l*. Out of that sum about 1200*l*. have already been subscribed, Lord Cork having contributed the sum of 50*l*. Up to the present we have heard of no protests by archaeologists and the like against this proceeding, such as there was in the case of the west front of Peterborough Cathedral. Outcry as there was over that, there have been no complaints after the work was completed. Repairs, in some cases rebuilding, are imperative for the stability of the structure, and photography stands as a witness as to how the original design of the architect is adhered to in these restorations. So it will do in the case of Bath Abbey, and it is to be hoped it will not be departed from. Let us have ancient buildings as they were, and their designs, whether good or bad, not "improved" upon.

#### THE NASCENT SILVER AND SUB-HALOID THEORIES.

It is easy to demonstrate, by reference to photographic literature, that most investigators of the chemistry of photography hold that the latent image formed by exposing a film containing a silver haloid to the action of light consists of a sub-haloid. Other investigators hold a different opinion, and affirm that the image consists of metallic, or so-called nascent, silver.

Professor Richard Abegg has joined the representatives of the nascent



silver theory by publishing, in the first number of the *Archiv für Wissenschaftliche Photographie*, a paper containing his views and a number of proofs which appear to him conclusive.

As these theories have been of great interest to me for a number of years, and I have also openly declared myself on the side of the sub-haloid theorists, I take the liberty to refer to the contentions raised by Abegg, and to give a number of reasons in support of my own views.

Abegg begins by asserting that, with the exception of the sub-fluoride the existence of the sub-haloids of silver has not been proved, and that those substances which are looked upon as sub-haloids should be considered as consisting rather of a mixture of normal haloid and metallic silver.

It may be pointed out, in opposition to this opinion, that, although it may perhaps be impossible to prove the existence of the sub-haloids directly, their presence must be inferred from the behaviour of an exposed film of silver bromide. It is an essential condition of the sub-haloid theory that a film of silver bromide undergoes, by exposure to light, such a change that a portion of the bromine is lost, and a sub-bromide consequently formed. If this is assumed, it must necessarily follow that, if we restore to the sub-salt the bromine which has been lost, normal bromide must be reconstituted. As silver bromide may be produced by simply adding a solution of potassium bromide to silver nitrate, let us ascertain if an exposed film of silver bromide may be reconverted to normal bromide in the same manner.

The experiment confirms the assumption. The impression formed by exposure to light disappears completely, and the image cannot possibly be developed. The same experiment was made with a wet-collodion iodide plate and a solution of potassium iodide, with the same result.

But, according to the nascent theory, the metallic silver which was present may have been converted by the haloid to normal haloid salt. In order to ascertain this, we will take a fresh-developed, fixed, and well-washed negative, which we know contains metallic silver, and immerse it in a strong solution of potassium bromide; but, instead of being converted to silver bromide, the silver, concerning which there can be no doubt, remains unchanged even after the lapse of hours. This clearly shows that there is a vast difference between the silver deposit and the product under consideration, which was obtained by the action of light upon normal bromide.

Nitric acid is a solvent of metallic silver. It should, therefore, be possible to remove the metallic silver from an exposed film, according to the nascent silver theory, by means of a dilute solution of nitric acid. This is a difficult experiment, as gelatino-bromide films cannot be used for the purpose; but the experiments of other writers have shown that this is not the case, that is to say, no silver is dissolved.

Abegg cites the fact that the impression formed by light upon an exposed film may be obliterated by means of nitric acid, as proof of the presence of metallic silver; but this evidence is discounted by the fact that many acids which are not solvents of metallic silver will destroy the impression formed by light. The changes which occur under these circumstances cannot be included within the limits of this discussion; but, under any circumstances, the action of nitric acid does not prove the correctness of the assumption of the presence of nascent silver.

It is generally admitted that the nascent silver theory starts with the assumption that nascent silver is only allied with normal haloid (we will assume normal bromide); but, in that case, how can the difference between slow and extra-rapid emulsions be explained?

According to the nascent silver theory, a very sensitive emulsion must of necessity contain a quantity of nascent silver in its original state. How is this formed? And, in that case, what change is brought about by light through its influence upon the film? Does it increase the quantity of nascent silver, and what part does the so-called normal bromide perform in the process of development? Moreover, if the plate is treated with a solution of potassium bromide before development, which does it affect, the nascent silver or the normal bromide?

A reply to these questions appears to present greater difficulties, unless we assume the sub-haloid theory, and, without interrupting the course of my argument, I will give a short answer according to the sub-haloid theory.

In this case normal bromide is only that which has been found in the presence of an excess of bromine. By contact with substances, or their solutions, which absorb bromine, it loses gradually its bromine, and changes to a sub-salt of unknown and unstable composition, and finally reaches a certain condition, in which it is reducible to metallic silver by ordinary developers.

The attainment of this definite stage of capacity for development may be brought about by divers causes, and notably by the effective action of

light. The nearer the sub-salt primarily approximates to this stage, the less work remains to be done by light, and *vice versa*. Secondly, substances which absorb bromine (sensitisers) can not only favour the formation of the intermediate stages between normal and developable bromide (ripening process of bromide emulsions, but may also bring about capacity for development, apart from light action (chemical fog).

Treatment with a solution of potassium bromide before development—even in the case of an unexposed plate—causes the sub-salt of the silver bromide to take up a fresh supply of bromine, and there is finally a reconstitution of normal bromide, or one of the intermediate stages between it and the stage at which development is possible may be brought about.

What is solarisation according to the nascent silver theory?

The sub-haloid theory asserts, if there is a greater loss of bromine than necessary to arrive at the stage of development, the sub-haloid probably absorbs oxygen as a substitute for the bromine, and oxidation occurs.

Abegg also adduces as another proof that an unexposed plate, when immersed in the developer, suffers reduction at those points where it is brought into contact with pure silver wire. According to his opinion, the metallic silver is the cause of extensive reduction, and this reduction is continuous in the vicinity of the primary nascent silver.

The frailty of this so-called proof is shown by the fact that a developable impression may be produced upon unexposed silver bromide by simply drawing the sharp corner of piece of paper across the film. Moreover, pieces of card used for the separation of films will, after the lapse of months, cause very considerable reduction. In both cases silver does not play any part, and there are many other substances that affect unexposed silver bromide films.

Abegg appears to attach great value to the following statement: "If the sub-haloid theory is carried to its logical conclusions, the activity of nascent silver must also be admitted, for, as soon as the sub-haloid, supposed to have been formed by light action, has been reduced to silver by the developer, any further strengthening of the image must be brought about by the formation of nascent silver. This strengthening of the image where the nascent silver is formed, and which takes place proportional to its quantity, is a further proof of the nascent silver theory."

This statement is difficult of comprehension. In my opinion it is merely a question of nascent silver or sub-salt, and they cannot both be maintained concurrently. According to the sub-salt theory, the sub-salt is reduced to metal, and the strength (actual density) of the negative is dependent upon the quantity of the reduced sub-salt. In no case can nascent silver, which may already be present in the film, conduce to the vigour of the image (? Ed. *Archiv für Wissenschaftliche Photographie*).

As fourth proof, Abney's experiment is cited, according to which a negative was intensified by coating it with unexposed emulsion and developing it. According to the nascent silver theory, the silver forming the negative induced a reduction of the adjacent silver bromide. But even this experiment cannot be considered conclusive, and I will return to it later. Suffice it to say, in the first place, that we are here dealing with an actual silver deposit, which is visible, whilst the nascent silver we are discussing is quite invisible. (The deposit may also be partly composed of dye-stuff, as in the case of pyro development.) We are therefore clearly dealing with a metal which has produced a developable impression where it has come in contact with the emulsion. This is nothing new or uncommon, and the experiment may easily be made with coins. It is of no importance whether it is due to chemical or electrical action, but, in either case, developable sub-bromide may be formed.

Another experiment of Abney's is also adduced, in which a film of unexposed emulsion is coated upon an exposed film. The image obtained by development was stronger in the upper than in the lower film.

Abegg concludes from this that reduction proceeds from the nascent silver situate at the contact of both films, and spreads in proportion to the activity of the developer. The image in the upper film must therefore be stronger, because it is attacked without any loss of power by the fresh developer. If both films are separated by a layer of pure gelatine, no image is formed, because "the nascent silver cannot exercise its function owing to this layer."

This fact, which is adduced as one of importance for the nascent silver theory, is very generally understood, and known as "transference of the image. In Liesegang's *Almanach* for 1883 we find the caution, "After exposure, the plates must not be placed in contact with each other, as the image transfers itself from one plate to the other." This, of course, is only the case when the plates are placed film to film, and I once had the opportunity of seeing an image which had been thus transferred; but the phenomenon is of much rarer occurrence than usually supposed.



The explanation of this, according to the sub-salt theory, is as follows: When a film deficient in bromine is placed in intimate contact with another film rich in bromine (which is certainly the case when an exposed plate is coated with emulsion), a struggle is set up to establish an equilibrium, and the film deficient in bromine robs the richer film by diffusion. In this manner an action equivalent to exposure is set up in the unexposed film. The impression formed by light upon the exposed plate is reduced in a corresponding manner. If the action is sufficiently prolonged, both films will develop similarly.

The following experiment of Abney's teaches us unquestionably that this process actually occurs. Cyanine is sensitive to light, and it is decomposed by yellow light. If a glass plate is coated with *platin collodion*, stained with cyanine blue, exposed to the spectrum, then coated with silver bromide emulsion, and developed *without fresh exposure*, an image is obtained upon that part which was exposed to the yellow rays, and where cyanine blue shows a band of absorption. This is easily explained by the sub-salt theory, but what explanation does the nascent silver theory offer as to the production of this image?

If we assume that decomposed cyanine absorbs bromine, the formation of the image is precisely the same as in the above case of transference; but, by the nascent silver theory, the formation of such an image is impossible, because no nascent silver can have been formed, and be it noted that the image is only formed where the cyanine has been decomposed.

Referring to the ripening of emulsions, Abegg attributes this to the formation of a certain quantity of nascent silver, and will not admit a modification of the silver bromide. "There should be little nascent silver in slow, but a considerable quantity in very rapid, plates, and adjacent thereto only normal bromide, which has not been affected by the ripening process."

According to the theory, nascent silver is the cause of development. In the absence of any explanation of the peculiar action of nascent silver, we should expect that its presence in large quantity should be conducive to more even reduction, and therefore to finer grain, whilst only a small quantity should cause uneven reduction and coarser grain. But this is in flat contradiction of facts, for very rapid plates (rich in nascent silver) are coarse, whilst very slow plates (poor in nascent silver) are fine in the grain.

In conclusion, reference is made to the development of bromide plates fixed immediately after exposure. Abegg arrives at the very remarkable conclusion that the difference between chemical and physical development is purely superficial, for he says: "In both cases the reducing constituent of the developer produces finely divided metallic silver. This takes place either from the silver salt contained in the film, or that which is added to the developing solution, and the nascent silver, by its attraction, requires most deposit where its presence is most abundant."

According to this, in the silver bromide dry process, the developer forms metallic silver from silver bromide (N.B., normal bromide, consequently also from the unexposed parts), and this wanders to the parts where most nascent silver is present, and there deposits itself permanently. According to the nascent silver theory, this migration of metallic silver must take place within the gelatine film, although it may be very circumscribed, if not quite impossible, for in those parts where nascent silver has been formed in largest quantity by the action of light, least metallic silver can be reduced, although most is required. It must here be distinctly observed that, in the physical development of a wet plate, the metallic silver image is formed by the developer almost exclusively upon the surface of the sensitive film. The metallic silver deposited from the silver nitrate possesses a freedom of mobility quite different from that which appears possible in a gelatine film.

However, it is unnecessary that there should be any "wandering" or "deposition" of metallic silver formed by the developer. But it must be admitted unconditionally that metallic silver can only be formed from silver bromide through the action of light, and this must remain precisely where it was formed. Deposition upon nascent silver is therefore superfluous.

But, if we adopt the conclusion of the nascent silver theory, that the nascent silver reduces the adjacent silver bromide, it follows that, in the wet-plate process, there should be a general reduction of the film, and, conversely, it should be easier to develop a dry plate physically, which appears to be a *desideratum*.

It is difficult to ascertain how the formation of the image (imperfect, by the way) is really effected in the Kogelmann experiment (development after fixation), but, according to my opinion, it is far from proved that this is due to nascent silver.

Our knowledge of the process of fixation is still very obscure, as shown

by the fact that the most perfectly fixed albumen print may yellow in the high lights by formation of silver sulphide, from which it follows that a solution of hyposulphite of soda leaves an undestroyed silver compound behind, the nature of which is unknown. It is therefore equally possible that a compound may be left in the gelatine by the sub-salt, instead of the assumed nascent silver.

Moreover, as nascent silver is regarded as metallic silver, but cannot be seen with the naked eye, its existence appears more doubtful, from the fact that hyposulphite of silver has the power to dissolve silver to some extent. This is exhibited in a marked degree in the printing processes, where the visible metallic deposit (products of reduction) obtained by the prolonged action of light upon salts of silver is largely dissolved. Even the metallic deposit of a normally developed negative is largely dissolved under atmospheric influences. It seems very problematic, under such circumstances, that fine, invisible, nascent metallic silver should not be attacked and destroyed.

If nascent silver is identical with metallic silver, then it must behave in the same way, and this gives rise to numerous consequences. How can Abney's cyanine experiment be then explained? But, if the so-called nascent silver is not metallic silver, what remains but the inference of a sub-salt?

As long as no more conclusive grounds are offered for the existence of nascent silver, I shall maintain that the sub-salt theory is more simple and reliable than the nascent silver theory. G. MEERCATOR.

#### IS THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION REPRESENTATIVE OF PHOTOGRAPHY IN PRACTICE?

A FOREIGNER visiting the Pall Mall Exhibition might possibly imagine that he would find it representative of the processes most generally worked in this country. If he did, he would certainly find himself considerably misled. Taking the 368 frames as given in the catalogue, we find that, where the processes by which the photographs were made are mentioned, two-thirds of them are by the platinotype and carbon processes, while there are only five by the gelatino-chloride process. There is only one mentioned print on albumen paper, and one "developed silver" print. Now, our benighted foreigner might well imagine that two-thirds of the photographs produced here were either platinotypes or carbon pictures, and that albumenised paper had become extinct; also, as there are no collodio-chloride pictures shown, that this beautiful process was quite unknown here. Now, as a matter of fact, by far—very far—the larger proportion of the work produced by professional photographers and the majority of amateurs is either P.O.P. or albumen paper, collodio-chloride coming in for its fair share. The two processes that figure so largely in the Exhibition are, as compared with the three last-named processes, but little used in every-day practice. Again, collotype printing, by which hundreds of thousands of prints are turned out annually, if not weekly, in this country, does not find a single place at Pall Mall; neither does process work, which at the present time is perhaps the most important branch of commercial photography, and has made more important strides during the past few years than any other. Yet there is supposed to be a technical section of the Exhibition.

#### FOREIGN NEWS AND NOTES.

**Blue Prints and Photo-zincography.**—C. Fleck, writing in the *Photographische Chronik* on the use of grained zinc plates for three-colour printing, gives the following formula for preparing a ferro-prussiate sensitising solution. The prints produced upon the zinc plates are only used as a guide by the artist, who makes three-colour drawings as in chromo-lithography. For the sensitising solution take—

Distilled water .....	100 c. c.
Alcohol .....	15 "
Ammonio-citrate of iron .....	15 grammes.
Ferricyanide of potassium .....	10 "
Gum arabic .....	5 "
Honey, or caramel .....	2 "

The gum arabic may be replaced by three times the quantity of albumen, or five times the quantity of fish glue. The plates should be immersed, before coating, in dilute filtered gum water, and to obtain an even film the plate should be twice coated with the sensitiser, starting each time from opposite corners. Equalise the film upon the whirler, and dry over a spirit lamp. Print till the shadows



are slightly bronzed. The printing must be done in sun or electric light. If over-printed, reduce with yellow prussiate of potash. The correctly exposed prints should be washed for ten minutes in water, and the image thus obtained is in Prussian blue. After drying, the drawing may be made over the print with Lemerrier's chalk, No. 2.

**Printing-out Paper.**—In the *Bulletin de la Société Française* M. A. Blanc gives the following directions for making gelatino-citrate paper. The name, although in general use, is somewhat misleading, as most of the papers contain very little citrate of silver. The sensitive salt is mostly tartrate, and the chief characteristics of the paper are due to it, viz., fine blacks and whites, and facility of toning. The defect of citrate papers is their want of keeping quality, but this is obviated by use of a preservative solution consisting of—

Alcohol, 90% . . . . .	15 c. c.
Pale orange shellac . . . . .	5 grammes.

Dissolve by heat and rapidly pour into 100 c. c. of boiling water, filter through cotton-wool. The emulsion thus formed will keep for a considerable time.

To prepare the citrate emulsion take—

A.	
Gelatine . . . . .	9 grammes.
Chloride of cobalt, 5% solution . . . . .	6 c. c.
Neutral tartrate of ammonium . . . . .	2 grammes.
Citrate of ammonium . . . . .	$\frac{1}{2}$ gramme.
Water . . . . .	70 c. c.

Mix the above in a porcelain [coffeepot of about 150 c. c. capacity, and then dissolve in a smaller vessel.

B.	
Citric acid . . . . .	2.3 grammes.
Distilled water . . . . .	20 c. c.

To this solution add 2.5 grammes of crystallised nitrate of silver. Place both vessels in a water bath and keep the temperature between 70 to 80° C., not above. After well mixing, pour B into A quickly and at once, well stir and add—

Alcohol, 90% . . . . .	10 c. c.
Preservative emulsion . . . . .	5 "

Mix again and filter through cotton-wool.

The emulsion is at its best as soon as made, and is still good the next day, but afterwards it rapidly deteriorates. The coated paper, however, is of excellent keeping quality.

M. Blanc makes the following comments concerning the emulsion:—

1. The alcohol facilitates coating on account of the viscosity it imparts to the emulsion.
2. The chloride of silver is the principal sensitising agent.
3. The pluckiness of the image is due to the tartrate of silver.
4. The citrate of silver has a moderating effect.
5. The citric acid, in sufficient quantity, accentuates the contrast between the lights and shadows. It plays an important part in conjunction with the shellac in preserving the paper.
6. The free nitrate of silver gives depth to the image. An excess would be useless, and less than the given quantity would lead to inferior results.
7. Glycerine should never be added to the emulsion, as it detracts from the toning quality.
8. The emulsion should not be washed. Even if slightly, the quality would be lost.
9. Albumen, tartaric acid, sugar of milk, ammonia, and other substances have been used by the author, and have been found either useless or detrimental.

**To Preserve Fish Glue for Process Work.**—Herr Gaedicke recommends the following method in the *Photographisches Wochenblatt*. Clear the whites of some fresh hens' eggs and beat them to froth. Let them settle for twelve hours and pour off the clear fluid. The following stock solution should then be made up:—

Albumen . . . . .	7 c. c.
Fish glue . . . . .	7 "
Distilled water . . . . .	14 "
Carbolic acid (five per cent.) . . . . .	1 "

After well mixing, filter the solution thrice through cotton-wool. The solution will become perfectly clear if it is allowed to stand for

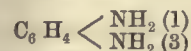
some weeks; but this is unnecessary, as the particles which produce the cloudiness are so fine that they may be disregarded. A ten per cent. solution of ammonium bichromate should also be prepared. Both solutions are stable. For use mix four parts of fish-glue solution with one or two parts of bichromate solution, and then add ammonia drop by drop until the fluid is of a greenish-straw colour. The sensitised solution should be mixed fresh each day, and the unused portion thrown away. This method will be found conducive to regularity and certainty of results.

**To Steel Copper Plates.**—Herr Gaedicke also recommends a bath composed of—

Water . . . . .	4 litres,
Sulphate of iron . . . . .	1 kilogramme,
Chloride of ammonium . . . . .	1 "

for galvanising copper plates and coating them with "steel." The solution should be acidified with sulphuric acid, to prevent the deposition of basic iron oxide. It was thought that photogravure plates might suffer from loss of detail if coated with "steel," but in practice this fear has been proved to be groundless. The life of a plate is enormously lengthened by the process, and the two-thousandth copy has been found very little inferior to the first.

**Platinum Toning.**—Under the heading of "Printing Processes," Professor Valenta contributes a paper to the *Archiv für Wissenschaftliche Photographie*, and in it refers to his experiments with various amines in the preparation of toning baths. Very favourable results were obtained with m-phenyl-endiamine, the formula for which is



It is obtained by reduction from m-dinitro-benzole with tin and hydrochloric acid. Although this substance decomposes solutions of gold chloride very quickly, which renders it useless for gold toning, it acts very slowly upon the salts of platinum. A very suitable platinum bath for toning matt papers may be prepared with it, and Brandt & Wilde's Anchor matt celloidine paper has given excellent results. Professor Valenta recommends the following formula:—

Water . . . . .	100 parts.
Potassium chloro-platinite solution (1:100) . . . . .	10 "
M-phenyl-endiamine solution (1:100) . . . . .	10 "

The prints should be vigorous and washed slightly before immersion in the bath. Fix with ten per cent. hypo solution, and wash in running water. The tone is an intense black with pure white. If blue-black tones are wanted, the prints, after the first washing, should be slightly toned with a borax bath (water, 100 c. c.; borax, 10 grammes; fused acetate of soda, 10 grammes; chloride of gold solution, 40 c. c.). They should then be well washed and toned with the platinum bath. The whites will suffer if the prints are insufficiently washed between the two toning baths.

#### SOME PHOTOGRAPHIC COMPARISONS.

At the meeting of the Leeds Camera Club on Wednesday, September 27, the President (Mr. W. J. Warren) in the chair, there was a large attendance of the members and their friends to hear Mr. A. Horsley Hinton, editor of the *Amateur Photographer*, give a lecture on "Some Photographic Comparisons."

At the outset Mr. Horsley Hinton expressed the pleasure it gave him to see his Yorkshire friends so well represented at the large exhibitions just opened in London, and also that a member of their own Club had been awarded that much-coveted distinction, the Royal Photographic Society's medal, and, though he did not infer that acceptance at the London exhibitions was the only thing to strive for, yet, as things were at present, a medal at one and acceptance at the other are the two highest recognitions of merit which the world can bestow upon photographers, and he hoped that in the future Yorkshire photographers thus distinguished may increase. It might be a useful comparison to endeavour to trace why there should be amongst them some dozen or so who were so much better than their fellows, and they would find it was due to hard, trying persistence and self-devotion. Too many of them did not approach it in the right spirit, but made it more of a pastime, and it was often a question as to whether they should take their camera, their dog, or go to a football match. Each photographic excursion should be a continuation of the previous one, the interval being occupied by thought and consideration, based on the experience which the previous



outing had given. He did not suggest they should make it a serious business, and the only pursuit outside of their daily avocation, but rather to suggest that what they did do they should do well, and on the right lines. They obtained at their lectures the best instruction and advice, and those who did succeed were those who made their hobby continuous and persistent. He did not ask them to spend whole days dreaming away in the fields, but they would find it better to spend an afternoon in studying, watching, and familiarising themselves with the various moods of nature in any given district, without even troubling to expose a plate, and then going again, with the full recollection of their previous impressions, would give them a sympathy with their subject which no other course would obtain. The lecturer next dealt with the manipulations of the negative, and, by comparison of the prints taken direct from the negative, he showed how, by a judicious system of printing and the subordination of certain parts, the lighting of others, how the harsh, matter-of-fact print, devoid of all feeling and utterly untrue to nature, could be transformed into a picture full of life and feeling, conveying to the mind those impressions of nature which the worker felt when he made the exposure. The photographic camera will, said Mr. Hinton, play you many tricks. It will make the blue sky come out white, the grey-green foliage of the willow trees as dark as the Scotch fir or the cypress, show distance and rich shadows harsh and solid, and in a thousand other ways play you false unless you have studied, watched, thought over things, and become intimately acquainted and accustomed to nature. You will then, perhaps, discover that the phases which impress you most, and the memory of which it is most easy to carry, are those when clouds lour, and the low light throws long slanting shadows, and the moisture-laden air suffuses all with delicate grey mists.

The lecture was followed with the closest attention, and a very cordial vote of thanks was tendered to Mr. Horsley Hinton for his remarks and beautiful examples of some of his finest work, shown by way of illustration, much of which was from negatives obtained in Yorkshire.

#### LIGHTING: ITS IMPORTANCE IN PHOTOGRAPHY.

PERHAPS there is no more important factor in the obtaining of successful results by means of photography than the possession of a thorough knowledge of the most suitable form of lighting to employ in the particular class of subject being dealt with.

It does not matter what particular branch of photography is being pursued, *lighting* is of the utmost importance, and any negligence in regard to it is certain to be reflected in the quality of the work turned out.

In portraiture, for instance, any one who has never experienced the difficulty can form no idea of the amount of labour and thought that is incurred in the fitting up of a studio before the best effects in lighting are obtainable, and, if this be necessary for the production of not only portraiture where specially fitted-up studios are concerned, but what is of equal importance, lifelike results, how much more difficult is it to obtain anything like equal results in what is termed "home portraiture," a branch of photography now largely practised by thousands of amateur workers, who derive a large amount of pleasure therefrom.

In studying any face it is intended to photograph, the first aim should be to ascertain what light best suits it, and it only requires but a little consideration by any one desirous of practising portraiture to understand that the light most suitable for one face would not by any means be equally so for another.

Therefore it follows that the professional, working in a specially fitted-up studio, has at command, by means of his top and side lights, each of which is furnished with a well-devised system of screening, a power which enables him to execute portraiture in a manner superior to that which any one working without these adjuncts and facilities need never expect to attain; and, if we examine still further into the question of what is required in lighting a face to its best advantage, we will find that not only must consideration be bestowed upon the amount of direct and diffused light employed, but some thought must be given to the proper direction from which both the direct main and also the diffused lights are permitted to fall on the face and figure of the sitter.

Portrait painters, as a rule, work with a side light falling at an angle of 45°, because this is found to suit the majority of faces; and this has been followed in a great measure by professionals in the construction of their studios.

In executing portraiture outside a specially fitted-up studio, say, in such a situation as a large-sized room having an ordinary window, much may be done to assist and improve the lighting of a face by means of a few well-arranged screens and reflectors.

When work of this kind is attempted in an ordinary room without any such provision being made, it generally ends in failure, by reason of the lighting showing too powerful contrasts, and this is painfully evident by the shadow side of the face coming out almost black, whilst the side next the light is far too hard—results brought about by a want of diffused light, to obviate which not only must there be provision made to throw reflected light upon the shadow side of the face, but, what is of much greater importance, the light that is permitted to reach the

side of the face next the window must be filtered or diffused by means of thin transparent muslin screens.

In carrying out an arrangement of this kind it does not necessarily follow that the entire surface of the window should have blinds fitted to it, for this would tend to cut off an amount of useful light, that can ill be spared when working under such cramped conditions of lighting. All that is required is to provide some simple screen of muslin of just sufficient dimensions as will be capable of diffusing all the main light that otherwise would reach the face. A screen of muslin, made by stretching this material on a light frame three feet square, so that the frame can be interposed between the face and the window at a point just outside the range of the lens, will be found to work admirably.

Any one desirous of attempting portraiture in ordinary sitting-rooms would do well to try the following experiments, from which he will be able at once to judge of the immense importance that is attached to the proper lighting of the face. At a distance of, say, four feet from any ordinary window, let a sitter be placed on as low a chair as possible, and let the body be posed so as to have the chest and front part of the figure almost facing the window, but not quite under the full light of same; then, without moving the chest or figure, let the face be turned away from the window until a somewhat side light only falls upon it. If the operator now steps back and views the effect of such a disposition of lighting, he will at once see that it is quite unsuitable, for the side next the window is much too brightly lighted, whilst the off-side of the face is enveloped in deep shadow, in which the finer details of the face are entirely buried. At this stage let the operator bring to his aid the services of some kind friend, and, without altering the position of the sitter or moving from the same spot from where he viewed the effect, let his friend or assistant hold up slightly above the head of the sitter, at a point between the same and the window, the muslin screen described previously, and the very moment it is placed in position he will be surprised at the change that comes over the sitter's face, for not only will the side next the window, that was previously far too bright, appear to be beautifully softened down, but the shadow side will immediately appear to lighten up, and the dense shadows previously apparent will disappear, and detail spring into view that was entirely unseen before the screen was placed in position. And, if at this stage the services of some simple reflector be brought into requisition, so that a somewhat front side light be thrown upon the front as well as the shadow side of the face, a marked improvement will have been effected, and, under such conditions, heads and busts may be well photographed in any well-lighted sitting-room; but it must not be imagined that full effect is capable of being given to every class of face in such situations, for this is really impossible with some kind of faces, where more or less top light is required to yield lifelike results, and which can only be attained in properly fitted-up studios.

In another branch of photography, viz., copying, lighting also plays a most important part. Take, for instance, the photographing of oil paintings. Here, again, we see the need of having command over the light that is permitted to reach the object, for hardly any two pictures will be found that require exactly the same treatment, as, apart from the ever-varying range of colours met with, there are also great differences in the skies, some paintings having wide expanses of such and others none at all, and these large portions of what may be termed high lights in a painting require to be specially treated in the way of lighting, otherwise these parts are hopelessly over-exposed before the details in the darker portions are sufficiently brought out, and it is only by unwearied practice that any one becomes expert in the copying of oil paintings. That very much of the success in this work lies in being able to have complete control over the light at command the writer well knows, for his experience, gained by photographing hundreds of oil paintings during recent years, has clearly shown that there is a best form of lighting for this particular class of work, and this will probably be found by those anxious to undertake the work in the direction of a top light alone; but it must also be a very high light, and the studio must also have plenty of length, so situated that sunlight never reaches it. With such a high top light there is no difficulty experienced with reflections from the surface of the paintings, provided they are placed upon the easel in a vertical position and suitable material is spread over the floor. This is the natural outcome of a simple law in optics, and without a suitable light there will be no end of trouble in equally lighting the surface of any picture, and, in the case of oil paintings, any broad expanse of reflection is quite fatal.

The obtaining in monochrome of correct colour values when photographing coloured objects is quite a different matter now to what it was fifteen years ago. At that time the reproduction in monochrome of coloured objects was considered well-nigh an impossibility, and what was attempted in this direction before the introduction of chromatic plates was confined chiefly to the manipulation of the negative and the special treatment of same in printing.

These negatives were generally produced in a thin, fully exposed form, and were largely worked up by hand, such as the strengthening of high lights and half-tones, and also giving depth to the shadows, thereby lowering the tone of the colours which came out too prominently and raising others to their proper proportions. Although in the copying of oil paintings more or less of this kind of modelling is still practised, the



wonderful improvements effected in the orthochromatising of plates has tended to reduce the labour previously necessary to a very great extent, and now, with a well-appointed system of top lighting and facilities for shielding certain portions of the object, results are obtained far in advance of those produced years ago.

In connexion with the photographing of numerous light-coloured objects, such, for instance, as statuary, the direction of the main light, as well as the quality of the light employed, plays a most important part if pleasing results in light and shade are to be secured. It is quite surprising the difference in appearance such objects will present under varying dispositions of light.

With heavy objects, such as statuary, much difficulty is sometimes experienced when they have to be photographed in unsuitable positions. As a rule, however, a well-diffused top light, backed up with, when necessary, an increase of reflected light at such points as bring into strong relief such parts as require to be portrayed as high lights, will be found to yield excellent results.

Heavy statuary as a rule, especially in all well-appointed public galleries, is never placed in a situation without a considerable amount of thought being bestowed upon the manner in which it is to be lighted, but it will be found very often the ever-varying direction of the sunlight and daylight always yields a particular hour of the day when it is seen to the best advantage, and this should be closely studied when photographing same.

In commercial work there are innumerable instances where special provision has to be made for certain objects, among which may be mentioned such articles as delicately formed fabrics, in which fine tracteries are present, and in which also the design is represented by the form of the fabric, an instance of which we see in lace articles and fine embroideries. When dealing with many of these, special provision must be made when stretching them, so that the design of the lace is not interfered with by excessive stretching, and this is best accomplished by using a special stretching frame, which only applies equal tension in all directions. Lace curtains, for instance, have frequently to be photographed for process-work. Here, again, not only must special attention be given to the lighting, but they must be treated in such a manner as to bring out the pattern and design in bold relief. This is accomplished by photographing them when they are suitably distended on stretchers, and placed under a very high top light only, with an absolutely black background, and this must on no account be brought close up to the fabric, as many suppose, and sometimes actually place in contact with the curtains.

For a background in work of this description there is nothing to equal black velvet, placed at least twelve to fifteen inches behind the fabric, and when such arrangements are carried out, and a slow transparency plate used with a very full exposure under a high top light, beautiful reproductions of the finest design and tracteries are possible of accomplishment.

In work of this description the faintest inequality in the lighting will be apparent when the negatives reach the printing stage, so that it frequently happens that some experience and previous test of which is the best portion of the studio to employ at a given hour of the day is required, so as to produce nice even results that permit of good process blocks being produced.

T. N. ARMSTRONG.

## ALUMINIUM.

ALUMINIUM, which was among the many discoveries of the great Sir Humphrey Davy, is the lightest metal manufactured, and is consequently largely used at present for optical, mathematical, and scientific instruments, several purposes in photography, bicycles, ship-building, and has also been tried for cooking utensils. Although possessing many advantages over other metals, it has some disadvantages; if some of these disadvantages can be overcome in the future, the metal will be very extensively used. Its advantages are lightness, strength, almost absolute freedom from oxidation by the atmosphere, the ability to take and keep a highly polished surface, almost like silver in appearance; it is not attacked by nitric or sulphuric acids at ordinary temperatures, but will dissolve in hot sulphuric acid and in hydrochloric acid at ordinary temperatures. The disadvantages are that it is attacked by all alkalies, will not solder well, is rather difficult to work, and does not stand friction well.

Taking its advantages first, articles manufactured from it are about one-third the weight of those made from brass, copper, gun metal, or nickel silver; and, especially in surveying instruments, which often run rather heavy, and sometimes require to be carried about a good deal, the saving of several pounds' weight is a great consideration in a long day's work, the strength of aluminium is surprising, almost equalling that of steel, and for many purposes its freedom from oxidation by the atmosphere, and the fact that it is not affected by most acids, is a great consideration.

Turning to its disadvantages, its liability to be attacked by all alkalies is greatly against it being used for many purposes, as no aluminium article should be used for solutions of any of the salts of calcium, strontium, barium, lithium, sodium, potassium, and ammonium, as the alkali

solution brings up what appear like little blisters upon the aluminium, and turns it black. This has been very much overlooked by manufacturers, or we should not see cooking utensils made of aluminium, although in a good many ways it is very suitable for such purposes, for it is a good conductor of heat, thus economising fuel. Its lightness is a great advantage for large vessels. It is not affected by the acids in food, consequently no injurious metallic compound finds its way into the food; but, on the other hand, cooking utensils almost invariably have to contain, or be cleaned by, some solution of sodium, either in the form of the chloride or common salt, or the carbonate commonly known as washing soda. This fact also debars it from serviceable use in ship-building, for which purpose, on account of its strength and lightness, it seems especially fitted; but, sea water being highly charged with chloride of sodium, attacks aluminium very quickly. In proof of this, an interesting experiment may be tried. If a fairly strong solution of soda or potash is heated to well over 100° F., but not allowed to boil, and a piece of aluminium is immersed in the solution, all round where the aluminium is, the water will appear to boil. On taking the aluminium out, the water is found to be quite still again; but, on reimmersing the aluminium, the effect is reproduced. The stronger the solution of the alkali, and the higher the temperature of the water, the more quickly does the action take place. If the solution is only faintly alkaline, the effect is so slight as to be scarcely noticeable. The explanation of this phenomenon is that the aluminium has the property of decomposing the water into its elements, and of being itself dissolved by the soda or potash, forming aluminium hydrate.

Formerly aluminium was very expensive, as sodium (also a very expensive metal) was necessary to extract it from the clay from which it was obtained; but the increased demand for it, and the improved methods of production, have gradually reduced the price, and it is now one of the cheapest, as well as one of the most plentiful, of metals, and, by reason of its lightness, one pound goes as far as three pounds of brass or other metals, thus reducing it to one-third of its cost price as compared with other metals; but the difficulty in casting and working it tends to make articles manufactured from it expensive, or, at any rate, more expensive than those from other metals. Aluminium castings require to be carefully made, or they are liable to be spongy and useless.

Although aluminium may be turned very well in a dry state, some lubricant (generally turpentine, or turpentine mixed with paraffin) is necessary for filing, drilling, tapping, planing, &c., or the metal tears and scratches, and no smooth or satisfactory surface can be obtained. Another difficulty is that no suitable and reliable way has yet been found of soldering aluminium, so that parts which require to be joined must either be screwed or riveted, this being more expensive than, and not so satisfactory as, soldering. This opens out a good field for inventors, as, undoubtedly, a good aluminium solder, or flux, would have an extensive sale. Aluminium is found in rubies, sapphires, topaz, corundum, diaspore, granite, basalt, porphyry, felspar, emery, clay, and the useful family of alums, aluminium being the element which makes the latter such a valuable mordant in dyeing, as, in conjunction with many of the dye colours, it forms what are known as lakes, which fasten on to the fibre of the material that is being dyed and make the colour fast. Aluminium is also the element which mainly helps to make alum so largely used by photographers and process workers for hardening gelatine, to which it also acts as an antiseptic.

Aluminium can be alloyed with most metals, but does not form an amalgam with mercury. Four to ten per cent. added to brass or copper greatly increases the strength of the resulting bronzes, they then being able to stand about three times the strain that ordinary brass or copper will.

If two aluminium surfaces are allowed to work together, the friction causes them to what is technically known as "fret," i.e., they wear out quickly, and usually wear into grooves. All metals "fret" more or less, although, if the two surfaces are of different metals, the friction is greatly lessened. Thus, we generally find brass working against gun metal or steel, and in the best-made instruments, where aluminium is used, the aluminium is made to work against brass, gun metal, or nickel silver.

Presumably, because hydrochloric acid will dissolve aluminium, all substances containing chlorine seem to attack it, so that, if aluminium is what is technically known as "bronzed" (i.e., a shade generally black, green, or bronze colour is imparted to it by immersing it in a chemical solution of a metal, which the metal to be "bronzed" has the power of reducing to the metallic state), it should never be done with a chloride bronze, as, by the use of it, the aluminium article so treated eventually becomes very rough upon the surface. Brass or gun metal are often so treated, and generally with a chloride "bronze," which is quite safe for them, but does not seem to answer well with aluminium.

Aluminium, being so strong, is difficult to bend when cold, and will often break instead; but, if heated slightly, it may be bent without breaking.

Aluminium is very suitable for the cells of lenses and other fittings of cameras, where little or no friction occurs, on account of its lightness and strength, they are not so liable to bend, besides which aluminium keeps its finish so well without being lacquered, where brass, which requires lacquering, after some little wear becomes dirty and unsightly through the lacquer wearing off and leaving the brass exposed to the air; it is



also very suitable for the stands of cameras, and, but for the unfortunate fact that it is affected by alkalis, it would be very convenient for the various dishes, &c., used in photography, on account of its cleanliness and strength; but, as the salts used in photography are to a large extent alkaline, usually sodium potassium and ammonium, aluminium would be sure to be attacked.

A prolonged immersion in very hard water, strongly impregnated with lime, will attack aluminium slightly.

Some of the alloys of aluminium have been largely used in the manufacture of cheap jewellery, known as aluminium gold.

C. T. SUTTON.

### THE BIG "D"

THE big "D" is a letter replete with interest, possessing unlimited versatility of definition; moreover, is of considerable importance to photographers according to the particular standpoint from which it is viewed. In a stroll through the streets of the metropolis early in the day the big D will be noticed glaring at you from numberless conspicuous stations enclosing three smaller letters in its semicircular dimensions. Everybody knows what it means, but few know of what it is composed with anything like chemical exactitude, its varieties are astonishing and, as far as photography is concerned, annoying as astonishing—dust, particles of every solid substance in existence depending for its composition chiefly on local conditions, even varying according to circumstances.

As far as photographers are concerned, it may be divided into two classes, chemical and inert dust, to say nothing about the adjectival rendering that is sometimes accorded to the big "D" to which the more solid matter gives rise. Chemical dust usually demonstrates its obnoxious presence in confined situations, such as the dark room or laboratory, where such substances as hypo, perchloride of mercury, pyrogallol, potassium sulphide, &c., may have been used, and either sprinkled on the floor or benches in a dry state or in solution spilled that may have dried up, the fine dust from which by the movement of the person being distributed throughout the apartment to settle on the first convenient surface that presents itself; sometimes this occurs to such an extent that the sense of taste is powerfully affected; at other times, although the tongue and palate may fail to detect it, the sensitive plates or paper will unfailingly do so, to the mystification and annoyance of the photographer, who then may perhaps be excused if he develops the big adjectival D. Chemical dust may be either soluble or insoluble; if insoluble, there is usually a nucleus to be found in the centre of the spot from which the action has radiated, or, in the various processes that the plates and papers undergo, the nucleus may be removed and thus set up a difficulty in correctly diagnosing the cause. As a rule, if the centre of the spot appears to have been the seat of more concentrated action than the rest of the fault, we may conclude some particle of not very readily soluble dust was the cause of it.

Metallic dust, usually iron or brass, is very frequently the cause of spots, especially on paper prints. To cause them, the metallic dust must have come in contact with the sensitive surface *before* the silver salt has been removed, for no dust of this nature will do much harm after its removal, that is, of the silver salt. A very soluble chemical dust affects the sensitive surface somewhat differently; providing it consists of bromides or iodides, the spots will probably be transparent, as these substances will not reduce the silver; but, should it be pyrogallol or sulphides, reduction of the metal immediately ensues and we have a crop of opaque spots.

I mention these few substances as the more likely to be found in the work-room of the photographer although there are many other chemicals that will produce similar effects, in fact, particles of any kind of dust that reduce silver salts will do so. Metallic dust on sensitised paper may escape notice until moisture is applied; the reduction then becomes rapid and by the time the prints are washed will have developed into eyesores, to the complete ruin of the proof.

Many printers, to their annoyance and chagrin, find that no sooner is the paper sensitised and dried than apparently clean paper, in the first instance, is bespattered into black specks, some of which remain as merely black specks, and some during the necessary processes of toning and fixing spread out and have a halo of their own. The metallic dust which causes this may have been introduced into the pulp of the paper during manufacture, or have settled on it before the completion of its preparation as sensitised, albumenised, or gelatino-chloride papers; it is in this latter case merely imbedded on the surface, and only waits the necessary moisture to develop its obnoxious presence. Inert opaque particles of dust may settle on plates or papers, and, merely by acting as a screen, prevent the light falling where they lie, and thus produce the clean spots of non-exposure, otherwise pinholes on the negative and white specks on the paper print. When dishes or measures have been standing some little time unused, it is always the best plan to well rinse and rub them out before putting them into use; however clean they may apparently be, as in the most carefully kept dark rooms there is certain to be more or less dust sure to accumulate, and in all probability possess active chemical quality, the dust from spilled solutions being generally energetic in character, the dust of dried sodium hyposulphite being more dangerous in small than in large quantities. The least trace of it

will upset the best toning bath ever made, and produce that yellowish, glazy appearance sometimes found on prints when being toned after contact with it. The toning action, moreover, seems entirely destroyed, and no additional gold in the bath will set it right; when this happens, it is quite hopeless to expect a decent coloured print.

I am inclined to think that many failures in amateur toning are owing to this contamination. The most minute particles of potassium sulphide—although this chemical is not much used by amateurs it is occasionally for precipitating weak silver solutions or intensification of negatives—will, if it gets on to a print at any time, utterly spoil it, as it is not necessary for any free silver to be present to start the action; a tiny yellow speck at first appears that spreads considerably in a short time; if on the white of the prints it is very unightly, and if on the subject entirely destroys it and leaves a yellow patch instead, with no possible remedy. Metallic dust also frequently accumulates in the rebates of the printing frames, and also on the pads, and is produced by friction from the hinges and springs, that in damp weather will help to produce a plentiful crop of defects. Dust is also dangerous when it settles on the prints that happen to be floating on the top of the water during washing if they are left quiescent for some hours. In fact, in almost all stages of photographic work, dust is an insidious enemy, and is to be guarded against, from the coating of the plates and paper to the mounting and drying of the finished work. Work-rooms should never be swept or dusted just before they are required for use, the dark room especially, the more sensible plan is to do any dusting that is required in the dark room after the day's work is finished, then by the next morning it should be free from any dust likely to give trouble. By some this may seem an unnecessary precaution, and I am aware there are dark rooms that never get swept or dusted from one year's end to another, and yet good clean work is turned out. It need scarcely be said that slovenliness in this respect is risky, and usually eventuates in some mysterious defects appearing on plates or paper at some particularly inconvenient time, the source of which remains hidden in obscurity. The old adage of "letting sleeping dogs lie" is, I think, wrong in principle, for, if the dogs are dangerous, it is much better to remove them and get clear of both dogs and danger at the same time.

EDWARD DUNMORE.

### COLOURING PHOTOGRAPHS.

ALTHOUGH photography in colours has been greatly improved of late, it has not as yet come into general use. I am afraid it will be some time before it is taken up commercially by the provincial professional, on account of the expense of its working, and as results quite equalling those obtained mechanically can be coloured by hand with less trouble.

Several years back, hand-painted photographs were not very popular; this, no doubt, was caused by the highly coloured inartistic daubs that were sold in gaudy frames. Now that photographs are artistically painted, there appears to be quite a craze for them, and no one is considered "up to date" unless they possess one of themselves.

If carefully and tastefully executed, colouring does vastly improve a photograph. Some, of course, do not lend themselves to it, for the simple reason that the original view or portrait did not contain much colour. The principal fault of most painted photographs lies in the artist having used brilliant opaque paints, which destroy the beautiful half-tones and details. To obtain success, transparent colours are necessary for the groundwork, as with them the high lights, shadows, half-tones, and detail may be preserved. Of course, opaque colours must be used sometimes, for the number of transparent ones at the disposal of the artist is very limited, but they will have to be very sparingly applied. A knowledge of drawing is not necessary, the outline and lights and shades being supplied in the photograph; but a training in water-colour painting would be of great assistance in tastefully arranging the colours.

An artist who has been using oil colours will find some difficulty in colouring photographs, because in painting on canvas he paints solidly, whereas on photographs the colours are applied thinly, to allow the detail to show from underneath; but this can soon be got over by a little practice and patience. A little experience in the mixing of the various paints to obtain certain tints, and taste with regard to the colouring so as to get the most artistic results will considerably help, but is not essential, as it will come by practice. There are persons that can sit down and paint a photograph in an artistic way straight off without being taught; others, again, take some time to learn, not because they are "duffers," but they have not the talent.

Photographs by any process, except on very rough paper, will colour well, providing they are brilliant and sharp. A bromide opal, no doubt, is best, as the surface being matted allows the colour to be more easily applied than on a glazed print. If the photographic image is contained in a layer of gelatine, no medium will be required. Oil colours are the most suitable to use, and they have the advantage of being easily removed if a mistake is made. It will also be found that they will not fade so quickly as water colours, and the colouring matter, being of a greasy nature, does not soak in and affect the permanency of the image, as water colours are liable to.

The colours at the disposal of the photographic artist are not many, but are ample providing discretion is used in the mixing of them. The



most suitable are: burnt sienna, crimson lake, Prussian blue, burnt umber, and Italian pink (this is a yellow). The above five colours are transparent, or nearly so, and are to be used for the groundwork—that is, to colour the photograph all over with. The other colours given below are to be put in the extra tints and work up the high light and shadows. They are all opaque: flake white, vermilion, indigo, ivory black, light red, and chrome No. 2. All the above may be purchased in collapsible lead tubes at any artist's colourman.

Some makes cost about twopence or threepence each, but it will be best for general work to buy the better makes, being more permanent. A few of the colours run more expensive than others; for instance, vermilion and crimson lake are more than double the price of burnt sienna, but are put up conveniently in smaller tubes. The other necessary articles are three small sable brushes—Nos. 1, 2, and 2. Water-colour sables are much softer than those sold for use with oils, so are much better to use, as they do not leave so many marks. Two bottles of spirit of turpentine will be required. One should be purchased at the chemist's and the other at an oilman's. The former dries quickest, and, being pure, is used for mixing the paints with. The other will do for washing the brushes in. A piece of linen free from lint is necessary to dry them in. The photograph must first of all be mounted and allowed to dry before any colouring is attempted, and the mount covered up with a mask of paper to prevent it becoming soiled by the paint. It ought to be remembered that transparent colours mixed with opaque form an opaque paint.

For an example of the method of colouring we will suppose we have before us a river scene with towing path, trees, and hills in the distance. The first thing to do is to lay on the ground tints with the transparent colours. We will start on the water. To colour this, squeeze out a little of the Prussian blue—very little—on to an old negative glass, which makes an excellent palette. Add some turpentine to thin it, as it will be a great deal too thick in its natural state, and thoroughly mix with a brush which should be kept for that purpose. Take one of the sables—the medium size will be found about right—and start painting from left to right, at the lower part of the water, making the paint thinner as it gets higher up, to give it the idea of distance. The nearer the object is, the darker; and the farther it is away the lighter it should be. If the brush marks show, they may be lightly dabbed all over with the top of the third finger. This has the effect of making a fine stipple. The towing path is done in the same way, only, of course, using different paints. If of a light tone, burnt sienna; but, if dark, a mixture of burnt umber and sienna is the most suitable. The distance must be kept in the same way as the water. The trees near at hand may be painted dark, and those farther away light green. This is made by mixing Prussian blue with Italian pink. For dark green use a greater proportion of blue, and for light more Italian pink. Purple will be required for the hills in the distance. Prussian blue and crimson lake, using more of the former, makes an excellent one. The sky can be painted with Prussian blue, taking care to have it lighter as it gets towards the horizon. When all the ground colours have been put in, it must be allowed to partially dry before touching further. The reflection of different objects in the water must then be coloured, seeing that they are done slightly lighter than the original. The opaque colours may now be used for colouring the shadows and high lights, taking care not to touch the half-tones. Flake white painted over the high lights on the water will greatly improve them. The ruts from cart wheels, and shadows on the towing path may be heightened by burnt umber, and the brightly lighted parts of the trees and grass will look better if touched up with Italian pink. An evening effect can be obtained by painting the lower portion of the sky and upper part of the water over with crimson lake considerably thinned. Most of the other colours not mentioned above will work in for small objects such as boats, roofs of houses, &c.

The greatest care must be taken not to paint over the outlines or allow the colours to run, and the print, when drying, should be kept from all dust.

OSBORN THORNBURY.

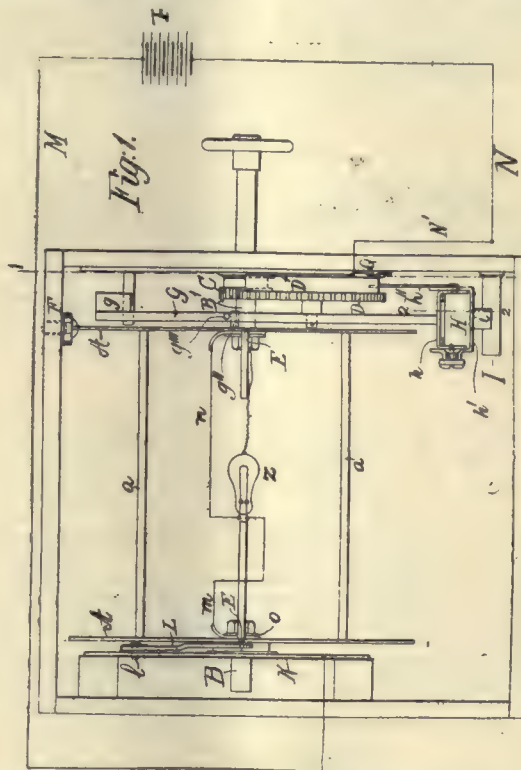
#### COIN-FREED APPARATUS FOR VIEWING STEREOSCOPIC TRANSPARENCIES.

MR. JOHN ROSE has patented an invention for this purpose which, according to his specification, consists essentially of a revolving drum, composed of two discs, *A*, connected together by four parallel bars, *a*, arranged to form a quadrilateral. The discs, *A*, are rigidly secured to pivots, *bb'*. The pivot, *b* (fig. 1), is insulated as hereinafter set forth. The pivot, *b'*, passes through the outer casing, and is continued to form a shaft, to which a handle, wheel, or the like, is attached for the purpose of causing the apparatus to revolve. On the said shaft, *b'*, within the apparatus, is keyed the small gear wheel, *c*, actuating the large gear wheel, *d*, which wheel has integral with it the smooth wheel or pulley, *d'*. This latter has a portion of its periphery cut away, so that a lever, travelling on the surface thereof, will fall into the aperture thus formed at each revolution, and act as a stop to its further motion.

The picture cards or transparencies are formed as an endless band (not shown in the drawing), connected together by hinged joints in any convenient manner, preferably somewhat in the same way as the pattern-card of a Jacquard loom mechanism, and the size of such transparency corresponds to the distance between the cross bars, *a*, so that each

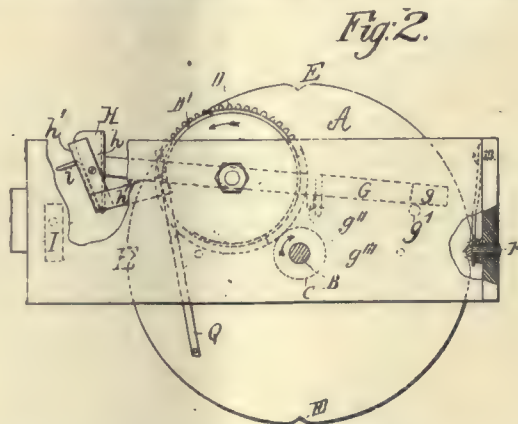
complete revolution of the apparatus will display four of the transparencies.

The edge of one of the discs, *A*, is provided with four notches, *x*, placed exactly 90° apart, and devised to engaged in the spring bolt or



catch, *y*, for the purpose of ensuring the exact register of the apparatus, and indicating to the person causing the same to revolve the exact position at which each successive transparency should be stopped.

The coin-freed mechanism consists of the pivoted lever, *e*, provided with a counterweight, *g*, and having at its other end the spring-coin hopper, *h*. This hopper consists of two parts, *h* and *h'*. The part, *h*, is rigidly fastened to the lever, *e*, and the part, *h'*, is pivoted to it, and is normally held close by means of a leaf spring or other convenient device (figs. 1, 2, and 5). To the lower part of the said piece, *h'*, there is attached a bar, *h''*, projecting backwards, and devised to come in contact



with the smooth wheel, *d'*, attached to the gear wheel, *d*. There is also attached to the piece, *h'*, a projecting lever, *i*, which is devised, when the said hopper, *h*, is depressed by the insertion of a coin, to come in contact with a stop or bar, *l*.

The electric-lighting system is as follows:—

A battery, *z*, is placed at any convenient position in the apparatus. The connecting wire, *m*, makes connexion with the outer metal support, *x*, of the frame, and through it and the connecting bar, *l*, with the central pivot, *b*. The bar, *l*, rides on the pivot, *b*, or a wheel placed thereon, which wheel may suitably be formed as a ratchet to prevent the apparatus being turned the wrong way. The pivot, *l*, of the bar, *l*, is



preferably provided with an insulating washer of rubber or the like at its inner end to prevent accidental contact with the disc, A. The disc, A, is insulated from the pivot, n, by means of an insulating washer and collar, o. From the pivot, n, the current passes through m to the electric lamp, z. The other wire, n<sup>1</sup>, makes connexion with the moving parts of the apparatus, when the same is operated as follows:—

The connexion is through the wire, n n<sup>1</sup>, to the spring, o, which may be an ordinary leaf spring or the like, and is so placed as to be in contact with the edge of the wheels, n<sup>1</sup>, as far as this extends. When the cut-

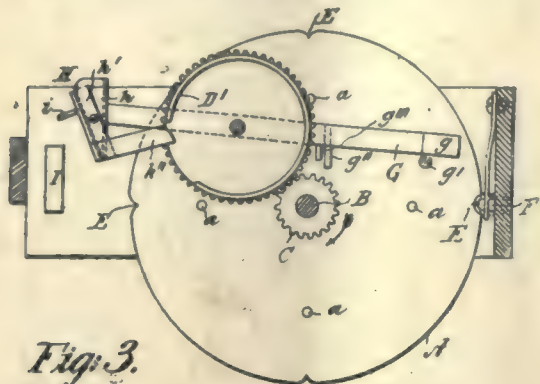


Fig. 3.

out portion of the wheel comes opposite to the spring, the contact is broken between the wheel and the spring, o.

The apparatus is operated as follows:—

When the apparatus is out of action, the parts are in the position shown in figs. 2 and 3, with the counter-weighted end, g, of the balanced lever, a, resting on the pin, g<sup>1</sup>.

Whilst the apparatus is in this position the shaft cannot be revolved, because the projection, g<sup>11</sup>, upon the disc, A, engages with the stop, g<sup>11</sup>, on the rocking bar, o, and locks the apparatus against motion in the

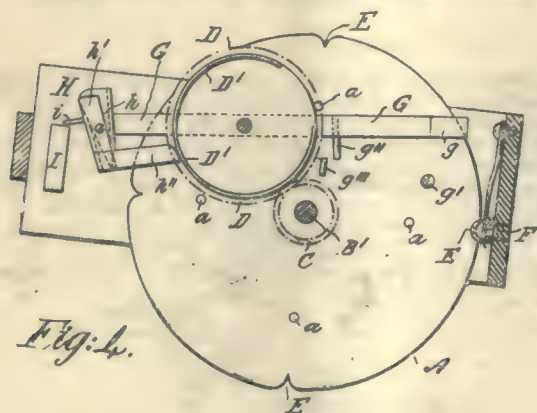


Fig. 4.

forward direction, whilst motion backwards is prevented by the ratchet bar, L.

As soon as an operator places a suitable coin in the slot of the machine and the same falls into the hopper, n, it over-balances the lever, a, and causes the projection, t, to rest upon the projection, i. This motion of the lever, a, and with it the stop, g<sup>11</sup>, releases the projection, g<sup>11</sup>, and allows the disc, A, and the gear wheels, c, d, and wheel, n<sup>1</sup>, to revolve, and at the same time the electrical circuit is completed by the contact of

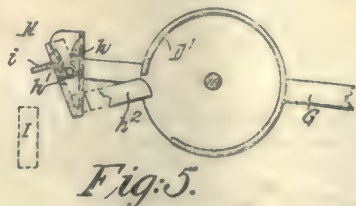


Fig. 5.

o with n<sup>1</sup> (fig. 4). This causes the lamp, z, to illuminate the apparatus, and the electric current will flow until the wheel, n<sup>1</sup>, has completed its revolution and the parts again fall into the position shown in fig. 2.

The coin which has fallen into n is discharged therefrom into the coin drawer as soon as the bar, h<sup>1</sup>, has risen upon the wheel, n<sup>1</sup>, and thereby

caused the coin hopper to open (fig. 6). In order to cause the apparatus to repeat the display another coin must be inserted in the slot, and the handle again turned, whereupon the operation will be again repeated.

In addition to the central illumination herein described the inventor may,

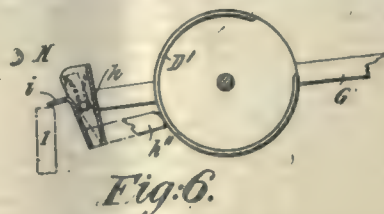


Fig. 6.

if desired, attain special pleasing effects by additional illumination reflected upon the transparencies. This light or lights may be coloured, and can be controlled by push buttons or other convenient devices within the reach of the beholder, enabling various light effects to be produced at will.

### TAKING PHOTOGRAPHS IN LARGE NUMBERS.

THIS invention, the patentee of which is Mr. R. E. Stapleton, the construction provides for one row of lenses, which may be arranged in either a vertical or horizontal line. In the accompanying drawing the lenses are shown as arranged in a vertical line with a duplicate row of lenses shown in dotted lines for the purpose hereinafter explained. Fig. 1 illustrates a back view, and fig. 2 a corresponding front view, of the camera; fig. 3 a sectional view taken on line, x x, of figs. 1 and 2. In order to expose the position of the lenses, the repeating slide, a, is drawn back in fig. 1, and the shutter, b, in fig. 2, showing in line the five lenses, c c c c c, which is to be taken as representing a convenient number for the purposes of illustration only. d is a spring catch secured to the camera casing, and adapted to click into a series of holes, e, regularly pitched in the framework of the repeating slide, a, in succession, these several holes being arranged in number and pitch, so that each successive engagement effects an exact adjustment of the impression plate to expose a section thereof to the series of lenses in the manner required for the purpose of my invention. In this way the whole surface of the impression plate may be covered by portraits or pictures, the full complement for each impression plate comprising, of course, the number of lenses set

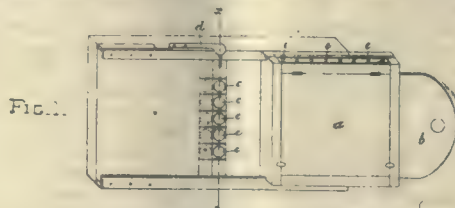


Fig. 1.

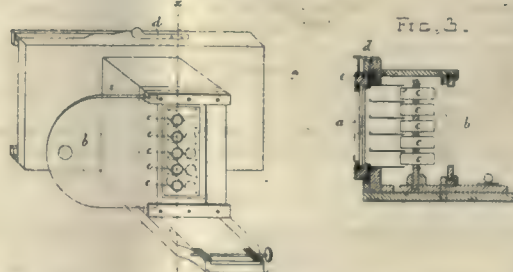


Fig. 2.

Fig. 3.

in line multiplied by the number of repetitions of sectional exposures for which the said impression plate is designed.

The apparatus may be varied in certain respects without departing from the essential features of the invention. For example, although we have mentioned one row of lenses only, this could be duplicated, as shown in dotted lines in figs. 1 and 2; but, although the number of exposures or adjustments of the impression plate is halved thereby for the same number of portraits for a given size of impression plate, the same variety of portraits would be correspondingly reduced, or the number of impression plates required would be doubled. It is therefore found in practice that, for the purpose of the invention, one row of lenses is generally more convenient than two rows.

And, furthermore, the spring-catch arrangement for adjusting the impression plate to a succession of positions by clicking into a series of holes, as shown and described, is only to be considered essential in respect of the purpose effected, and as indicating what is suitable therefor, for which other devices may be substituted.



## THE TELLA CAMERA.

At the meeting of the London and Provincial Photographic Association, on September 28, Mr. W. E. Dunmore, of the Tella Camera Company, Limited, showed and described the Tella film camera in its latest modified design. During the last twelve months several improvements have been effected over the original form, which was much larger and heavier than the latest pattern. It is now furnished with rising and cross fronts. A swing back is of no use in hand cameras, therefore a good rise of three-quarters of an inch, horizontally or vertically, has been provided. The camera focusses now from two yards' distance to thirty yards or infinity. The whole front of the camera, carrying the shutter and lens, &c., is made to slide completely off, giving access to the interior of the camera for dusting purposes, and similarly to the back combination of the lens. The method of using the cut films, for which the camera is designed, is unique. The films are taken in packs of twenty-five, with a small separating device between each film at one end. There is no straw board or any other agency of a deteriorating nature between the films used for this camera.

The full charge is fifty films, although Mr. Dunmore spoke to having used as many as sixty without mishap. The changing is very simple. There is no dropping of the film, and so no chance about it. It is pulled over, and during the course of this pulling only the edges or rebate of the film come into contact with the camera. Nothing whatever, from first to last, comes into contact with the film in the way of cards for separating purposes or during the changing action, hence there is less reason for the film to go wrong. One of the features of the Tella is that it tells when everything is right or wrong. If there is no film, it says as much, and if there is a supply it states the fact. Mr. Dunmore had with him a useful model of the camera with glass sides, which enabled his audience to observe every motion of the changing mechanism in the most conclusive manner. After exposure the films are conveyed into a chamber in the bottom of the camera, from which any one or the whole of the exposed films may be abstracted at pleasure.

The little separators, which form an essential part of the changing movement, fall into another chamber. The registration of the number of exposures is dependent, not upon the actual motion of the changing device, but upon the film itself. It is the film which actuates the mechanism for registration, and if the film, by any possible means, was not changed, though it might appear to have done so, it would not be registered as having passed over. The Company supplied films for the camera, but it was another point in favour of the instrument that any quarter-plate cut film could be used with the separator referred to. There is no special preparation of the film at all required. This is a great advantage, as many have had reason to learn. A Cooke lens, working at f-5, is fitted to the cameras. There is a Yale shutter, with pneumatic regulation, working from half to one one-hundredth of a second and time, which is placed between the combinations of the lens. Mr. Dunmore said that it was hoped very soon to have a 5 x 4 pattern on the market. He showed some of the trial negatives made with it. A cheaper pattern was also coming out, of the box sort, fixed focus, with magnifiers, but no rising front. The camera and parts were examined with much attention by those present, and a vote of thanks was passed to Mr. Dunmore.

## THE WELLINGTON FILM.

At the meeting of the Photographic Club, on September 27, Mr. Harry Wade read a paper descriptive of the Wellington Film. This film has a paper support, and consists of a very rich emulsion. It lies perfectly flat without special means being taken to this end, and may be exposed in an ordinary dark slide without support. It is thus especially recommended to travellers, and has points which will attract the ordinary worker. Development of the films presents no greater difficulty than in the case of glass plates, and they are treated in precisely a similar way, pyro and ammonia being recommended in preference to soda. There is less danger with the former developer of the gelatine being attacked, which might result in the film refusing to leave its paper support. It is asserted that no danger attends the practice of developing several films together in the same dish, abrasion not readily taking place. As a matter of fact, the films may be developed in a number, as prints are toned, any danger of the films adhering one to another being overcome by maintaining the circulation of the films. The paper support upon which the film is coated is translucent, and the progress of development may be readily watched and judged. After development, the films are transferred to an alum bath and finally fixed, an acid fixing bath being recommended by the makers of the paper. Mr. Wade, however, found an ordinary fixing bath to be just as efficient, and said that he never used any other. When the films have been well washed they are squeezed on to a clean glass or ferrotype plate and allowed to slowly dry, upon which they will either peel off by themselves or with very little persuasion. The negatives produced in this way are now ready for printing, the paper support being quite sufficiently translucent. Should objection be raised, however, to printing through the paper, the gelatine film may be easily separated from the paper by the help of a penknife. Mr. Wade demonstrated this separation, which seemed to present no special difficulties,

and is easier done than described. The back of such a stripped film presents a matt surface, which lends itself well to the pencil for spotting, mending defects, or faking generally. One of the advantages offered by the film is that of printing from either side, a fact which will find appreciation amongst carbon workers. An entire absence of halation is claimed for the Wellington film, and, in proof of this, a negative of a figure taken against a curtained window was shown. There was no trace of the defect named, but it was generally thought that the proof would have been still more convincing had the negative been exposed for the figure instead of for the curtains. The speaker also claimed greater keeping qualities for his film than for glass plates, but did not substantiate this by ocular proofs. In conclusion, he passed round some very fine specimens of work done upon the films.

Mr. F. A. Bridge, in giving his opinion of the films, thought that their chief advantage lay in their great toughness, combined with lightness; and, the Chairman having endorsed these remarks, a vote of thanks was passed to Mr. Wade for his interesting lecture.

## A SITTER'S PROPERTY STOLEN.

## PHOTOGRAPHERS' LIABILITY.

At Marylebone County Court, on Tuesday, Sept. 26 before Judge Stonor, Miss Annie Elizabeth Johnston, 1, Wellesley-mansions, West Kensington, London, W., claimed damages from Messrs. Hellis & Sons, photographers, Westbourne-grove, W., with respect to the loss of a watch and some cash, alleged to have been stolen under somewhat peculiar circumstances. Mr. W. Sanderson and Mr. V. D. Knowles were counsel for the plaintiff, and Mr. Cohen, counsel, defended.

The plaintiff, a young lady of attractive appearance, told her story as follows: On May 31 last she went to the studio of Messrs. Hellis & Sons to have her photograph taken. As she desired to be "taken" in evening dress, she was shown by a lady attendant to a small room, over the door of which was written "private." This room had only one entrance, so far as she could see, and the door was to be easily seen from the desk at which the lady attendant sat. After changing her attire and preparing for the sitting, she placed her watch and purse on the table and pulled a piece of paper over them. Then she left the small room, closing the door after her, and repaired to the photographic studio, while the lady attendant went back to her desk. On coming back to the small room, after the sitting, she was dismayed to find that her watch was gone and all the silver—5s. or 6s.—had been extracted from her purse. A peculiar feature of the theft was that the small chain and "charms" to which the watch had been attached were still carefully esconced under the brown paper. She immediately called to the lady attendant, and said, "My watch and money are gone, and you are responsible;" and the attendant replied, "Yes, but no one could come in here and go to the room without me seeing them." The assistant also added that such a thing had not occurred since she had been engaged at the studio, but that something of the kind happened in the time of her predecessor. The manager was also called, but was as mystified as the rest of them. Then she sent for a constable.

The Judge: Was there any one else about?

The plaintiff replied that a boy came into the photographic studio, while she was sitting, with the photographer's lunch. Continuing, Miss Johnston said that, after the constable was called in, she asked for the boy, but was told that he had gone to dinner. The lad did not return until ten minutes or a quarter of an hour after his hour. He was then searched, but, alas! watch and silver were not to be found.

Cross-examined: The door to the small room in which she left the watch and other articles opened directly on to the stairs, and upon these stairs some men were working. She could not remember whether she latched the door or not on leaving for the photographer's room, but she was sure that she pulled the door behind her. She did not think it necessary to ask the lady attendant to mind the watch and purse, because the room was marked "private."

Re-examined: The young lady attendant distinctly told her that it would be absolutely impossible for any one to pass into the small room without her seeing the person.

Counsel for the defence submitted that there was no case whatever against Messrs. Hellis.

The Judge: I think that there was negligence on the part of the plaintiff in not taking the watch and purse with her, instead of leaving them in the room, although it was marked "private." And I also think that she might have drawn the attention of the young lady to the watch and purse which she had left in the room.

Mr. Sanderson, for the plaintiff: But, if my friend's contention were allowed, it might be possible for any person, under the guise of a photographer, to carry on a wholesale system of robbery.

The Judge: But you must distinguish between what was necessarily to be left in the room—such as hat or coat—and such things as a purse or watch, which could be put safely in one's pocket.

Mr. Sanderson: But suppose the case of a person to be photographed, not in evening dress, but in tight.



The Judge: That is not this case. The plaintiff, I suppose, had a pocket in the back of her dress?

The plaintiff: No; it was in front.

The Judge: I must nonsuit the action, but I shall allow no costs.

Counsel for the plaintiff asked for leave to appeal, but his Honour refused the application.

### THE FORTHCOMING SOLAR ECLIPSE.

"Persons interested in the forthcoming total solar eclipse of May 28, 1900," says our contemporary *Knowledge*, "will be glad to learn that great care and forethought are being exercised by some of our leading astronomers in the necessary preliminaries for ensuring success, as far as is practicable, in the manifold problems which present themselves for solution in such expeditions. The path of the moon's shadow in the eastern hemisphere reaches from Oporto to Algiers, and the duration of totality ranges from one minute thirty-six seconds in Portugal to one minute six seconds in Northern Africa. The sphere of activity will be mainly in places between 8° longitude east and west of Greenwich, and latitudes 35° north to 42° north, thus affording an exceptional opportunity of easy access at a moderate cost to those who wish to visit the scene of operations. It is urged that Algiers should be occupied on account of its low cloud ratio, its accessibility, and its excellent harbour; in the region south of Madrid several railway lines cut the shadow track, so that the difficulty of transporting instruments will thus be minimised; some inconvenience, however, may be caused by the slowness of the trains, which run about fifteen miles an hour, and the long intervals between them, there being in most parts only two a day, and only about one an hour out of even Lisbon. Mr. Maunder has been very active in bringing useful information together for the benefit of those taking part in the expedition, and in this connexion the following particulars may be helpful: To Lisbon (or Oporto) and back, 10*l.*; to Cadiz, giving access to the centre of Spain, and back, 14*l.*; to Alicante, a port on the east of Spain, where the eclipse will be visible, 16*l.* Algiers is the final place to which the steamer will proceed, and remain there to act as an hotel for the party. The cost for the entire trip for those going to Algiers and remaining on board during the stay at Algiers would be 22*l.* 10*s.* These figures represent the cost to members of the British Astronomical Association. To friends the charge will be guineas instead of pounds. The Eclipse Committee ought to know definitely before the end of the year the exact number of passengers going and the ports which they may have selected, in order to be able to complete arrangements. As yet 114 or 115 names have been given in; but, in order to justify the Committee in completing the arrangements, they ought to have at least 200 taking part in the expedition. The entire trip will take eighteen days."

### SUGGESTED PHOTOGRAPHIC SOCIETY FOR CAMBRIDGE.

"*Helios*" writes to the *Cambridge Daily News*: "Now that the winter evenings are drawing in upon us, many young men, and, indeed, older ones, too, are thinking of how best to spend a little of their spare time. Cambridge is generally considered to be behind the times, and in the matter of a photographic society the assertion is certainly true. I am perfectly well aware of the fact that a small society exists within the walls of the Y.M.C.A., but for a town like Cambridge that is, in my humble opinion, not enough. We want a free and open society, i.e., one that does not necessitate one's belonging to a certain religious sect, and I am looking anxiously forward for some one to call a meeting for the purpose of seeing if such a society cannot be formed. About eight years ago we had a fairly good society in the town, but the members (or was it the officers?) ceased to give it any attention, and it died, with plenty of money in its pocket, so to speak, for, if I mistake not, a substantial sum was handed over to the hospital. There was a membership, I believe, of about twenty-five. Since then photography has advanced, and become advanced and become simplified, with the result that many others have joined the ranks. Can Cambridge support such a society? I fancy I hear some ask. In reply, I beg to state that, according to the latest returns, there are at least twenty towns of the same size as Cambridge, and no fewer than twenty-eight towns of smaller size, all now supporting photographic societies. In addition to the large number of clubs now existing, many provincial newspapers are devoting weekly or monthly columns to the art of photography, and I venture to say we could do with such a column in this town. We have some good amateurs as well as professionals in the town if they would but come forward. One gentleman has made his name by patenting a camera front, another is a well-known writer on photography, another a Fellow of the Royal Photographic Society, whilst many others hold high awards. Next year the Photographic Convention is to be held at Newcastle, and Oxford is hinted at as being the next, and why should not Cambridge follow? A Convention here would be the means of bringing into the town between 200 and 300 visitors, the majority of whom would stay the week. Now, then, ye disciples of the black art, stir yourselves, and see if a society cannot be established, and at least one night a week devoted to the art that is so dear to many of us."

## News and Notes.

**ROYAL PHOTOGRAPHIC SOCIETY.**—Ordinary Meeting, Tuesday, October 10, at 5*4*, Pall Mall East, at eight p.m. The President will deliver his annual address. The presentation of medals awarded at the Exhibition.

**THE Southsea Amateur Photographic Society's Twelfth Annual Exhibition** is fixed for January 29, 30, and 31, 1900. Entry forms and particulars are obtainable from F. Mortimer (Hon. Secretary), 10, Ordnance-row, Portsea.

**THE Southport Y.M.C.A. Camera Club's Third Annual Exhibition** of photographic work will be held in the Y.M.C.A. Hall, Eastbank-street, Southport, from six to ten o'clock in the evenings of Tuesday, Wednesday, and Thursday, October 17, 18, and 19, 1899.

**THE Montreal Camera Club's Fifth Annual Exhibition** will be held, November 21 to 25 inclusive, in the Club rooms and studio, 4, Phillips-square. The following are the open classes: Class A, prints (by any process), open to all; one silver and one bronze medal. (All prints will be first judged in this class). Class B, Portraits, open to all; one silver and one bronze medal. Class C, Lantern Slides, open to all. (In sets of four. Judged as a set.) One silver and one bronze medal.

WE regret to state that Mr. John Jackson, one of the oldest photographers in the country, died at his residence, South Dene, Rochdale, on Tuesday, September 26. He had not enjoyed good health for the last eighteen months, and had been confined to his bed for twelve or thirteen weeks. Dr. Sharples and Dr. Lord, of Castleton, were his medical attendants. Deceased, who was seventy-two years of age, was the last of five brothers who formerly carried on business as photographers at Oldham and Mill Middleton Junction. About 1865 he commenced business on his own account as a photographer in The Walk, Rochdale. For twenty-nine years he resided at South Dene. In 1885 he removed his business from The Walk to premises adjoining his residence, where it has since been carried on. Mr. Jackson was an advanced Liberal in politics, but took no active part in public affairs. He is survived by his widow, three daughters, and one son. The funeral took place on Friday, the 29th ult.

## Patent News.

THE following applications for Patents were made between September 18 and September 23, 1899:—

**ANIMATED PHOTOGRAPHS.**—No. 18,924. "Improvements in Apparatus for Viewing and Exhibiting Living Pictures or Animated Photographs." G. F. HATTON.

**CAMERAS.**—No. 18,828. "Improvements in Photographic Cameras." R. S. ATWATER.

**CAMERAS.**—No. 18,829. "Improvements in Photographic Cameras." R. S. ATWATER.

**DARK ROOM.**—No. 19,008. "Photographer's Clothes Trunk and Dark Room Combined." C. M. JORDAN.

**CAMERAS.**—No. 19,172. "Improvements in or relating to Photographic Cameras." A. L. ADAMS.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
9.....	Bradford Photo. Society .....	Demonstration: Slide Making. F. Nicholson.
9.....	Camera Club .....	Exhibition of a New Phonograph with Musical Selections. Lindsay Johnson, M.A., M.B., &c.
9.....	Oxford Camera Club .....	Exhibition of Slides lent by the Royal Photographic Society.
10.....	Ashton-under-Lyne.....	From Cornwall to Canterbury. Llewellyn Morgan, M.D.
10.....	Birmingham Photo. Society ..	The Manchester Ship Canal: its History and Construction. C. R. Sayer.
10.....	Hackney .....	Animal Photography. J. O. Grant.
10.....	Leeds Photo. Society .....	Technical Control for Pictorial Purposes. W. Thomas, F.R.P.S.
10.....	Royal Photographic Society ...	The President will deliver his Annual Address, and will present the Medals awarded at the Exhibition.
11.....	Camera Club .....	Ladies' Evening: Exhibition of Lantern Slides, by Members of the Field Club.
11.....	Groydon Camera Club .....	Last Day for Delivering Pictures for Exhibition.
11.....	Photographic Club .....	Members' Open Night.
11.....	West Surrey .....	Competition: Lantern-slide Making.
12.....	Camera Club .....	Paper by Captain W. de W. Abney, C.B., F.R.S., &c.
12.....	London and Provincial .....	Lantern Night.

**Liverpool Amateur Photographic Association.**—The Opening Meeting of the thirty-sixth winter session of this Society was held at the rooms in Eberle-street on September 30. Mr. Paul Lange was in the chair.—The Hon. Secretary (Mr. F. Schierwater) read the programme arranged by



him for the session. The arrangements as to lectures and demonstrations excited great praise from those present. Two of the more notable fixtures are Mrs. Main, whose lecture last year on "Mountaineering" was so well received, and whose subject will this year be "Mountaineering in the Arctic Circle," and Mr. Talbot Kelly, the well-known local artist. Mrs. Main's lecture will be delivered in the small concert room, St. George's Hall, on November 16. At the conclusion of the usual business meeting, Mr. W. PRIOR CHRISTIAN delivered a lecture on

#### SOME PHASES OF TUSCAN ART,

illustrated by numerous lantern slides. Mr. Christian handled his subject in a most masterly and at the same time most poetic manner, tracing the development of Tuscan art through the channels of painting and sculpture from the earliest times. The lantern slides included specimens of Byzantine art, the notable cathedrals of Pisa, with its leaning tower, Florence, and Siena, frescoes, and mosaics. The architectural slides were of the finest description, and several elicited marked approval from those present. At the conclusion a hearty vote of thanks was passed to the lecturer.

#### FORTHCOMING EXHIBITIONS.

1899.  
 October 6-Nov. 4 ... Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.  
 „ 6-Nov. 11 ... Royal Photographic Society. Hon. Secretary, Major-General Waterhouse, 66, Russell-square, W.C.  
 „ 11 ..... Ludlow Photographic Society. Hon. Secretary, 14, Mill-street, Ludlow.  
 „ 18-24 ..... Croydon Camera Club. Hon. Secretary, W. H. Rogers, 106, Holmesdale-road, South Norwood.  
 „ 22-Nov. 19 ... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.  
 November 15-17 ..... Hackney Photographic Society. W. Selfe, 70, Paragon-road, Hackney, N.E.  
 „ 20-25 ..... Longton and District Photographic Society. Thomas Mottershead, 43, Stafford-street, Longton, Staffordshire.  
 „ 27-Dec. 18 American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.  
 December 7-9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.  
 „ 11-Jan. 1900 Huddersfield (Invitation). W. A. Beevers, Cloth Hall-street, Huddersfield.  
 „ 27-30 ..... Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.  
 1900.  
 April 3-7 ..... Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### STAINS ON PRINTS.

To the EDITORS.

GENTLEMEN,—I noticed, in your Answers to Correspondents of the 15th inst., that "G. B. H." asked you the cause of a stain resembling hyponitric markings on prints, and I have seen several similar queries, especially about this time of year, and to all you reply 'faulty manipulation,' which, no doubt, is the cause of many marks but not every one, as instance a difficulty I had this summer, when batch after batch were stained yellow in cloudy patches (like sample enclosed), and which any one offhand would describe as caused by carelessness. I did the work all through myself with the greatest care and cleanliness. When the marks appeared I set about to find their cause, trying fresh samples of hypo and paper, but without effect; I then thought that the water might be at fault, so tied four thicknesses of blanket loosely round the tap to form a filter; the next batch of prints had not a single stain, and on removing the flannel

from tap I found that it contained a film of slimy matter (as sample enclosed), which smelt horribly, and, when stirred in a small quantity of water, discoloured it, like aniline dye, its presence in the water being possibly accounted for by the low state of the reservoirs, owing to the drought.

Trusting that the above experience will be of service to "G. B. H." and others,—I am, yours, &c., T. EVERITT INNES.

108 Wellington-road, Heaton Chapel, September 26, 1899.

#### MR. BLAND'S SUNBEAMS.

To the EDITORS.

GENTLEMEN,—On page 614 you put the question to me, "Are not sunbeams penetrating through a stained-glass window, as at Wirksworth, always parallel?" Beyond a reluctance to talk in public about my own print, I have not the remotest hesitation in taking up your challenge. The rays on the window recess referred to are entirely untouched; they are there as they were made by the sun and the glass, and therefore the fact that they are not parallel gives a distinct "No" to your question. Sunbeams penetrating through a window do not *always* emerge parallel. It may be, then, that photography has once again demonstrated that the things that are are not as we conceive them to be.

I enclose the original negative, a print from it, and the portion of the enlarged print showing the rays.—I am, yours, &c., W. B. BLAND.  
 Duffield, Derby, September 30, 1899.

[We have examined the negative and the prints Mr. Bland was so kind as to send for our inspection. The negative is untouched, and the positives are faithful reproductions of it.—EDS.]

#### THE BOOTLE PHOTOGRAPHIC SOCIETY EXHIBITION.

To the EDITORS.

GENTLEMEN,—I should feel extremely obliged if you would draw attention in your valued paper to the fact that entry forms for above Society's Exhibition must reach me at 188, Strand-road, Bootle, Liverpool, on or before October 10, and the entries themselves be delivered, carriage paid, by October 21.—I am, yours, &c., THOS. A. DODD.  
 188, Strand-road, Bootle, Liverpool, October 2, 1899.

#### THE AMATEUR PHOTOGRAPHIC SOCIETY OF MADRAS.

To the EDITORS.

GENTLEMEN,—Will you kindly allow me an inch or two of your space to say that I have once more taken up the duties of Hon. Secretary of the Amateur Photographic Society of Madras, and that on this occasion I have also been appointed Editor of the Society's Journal?

I should be much obliged to editors of photographic papers if they would kindly exchange papers with us, and I trust that, when we have got into working order in a month or so, our Journal will contain matter more original and useful than it has for some time past.

I should also be glad if manufacturers and dealers would send me price-lists and memoranda of anything new. The latter would be still more useful if accompanied by small samples for demonstration at our monthly meetings. My address is, The Masonic Hall, Mount-road, Madras.—I am, yours, &c., F. DUNSTERVILLE, F.R.P.S.,  
 Secretary Amateur Photographic Society of Madras.

Madras, September 14, 1899.

AMONGST the few exhibitors of lantern slides at the Royal Photographic Society's Exhibition is Mr. Graystone Bird of 38, Milson-street, Bath. This gentleman shows a set of six, consisting of figure and other studies: they are remarkably bright and interesting slides.

MESSRS. RAE BROS. of 134, St. Vincent-street, Glasgow, send us their catalogue of lanterns and lantern slides. Including the optical part, the catalogue runs to 190 pages. It has many phototypic and other illustrations, and at this season of the year it should be found valuable for reference by all those interested in optical projection work.

MR. W. H. ASSENDER, of the Trilby Incandescent Lime Works, 2, Vestris-road, Forest Hill, London, S.E., informs us that he has severed his connexion with the Nottingham Incandescent Lime-cylinder Syndicate, Limited, and its kindred businesses, and has established himself at the above address as a manufacturer of lime cylinders for use with either high-pressure or blow-through oxyhydrogen mixed gas jets. Mr. Assender adds: "After many months' scientific research, I have discovered a method of treating solid block lime, which not only enhances the brilliancy and whiteness of its incandescence, but improves the durability of the lime." It is Mr. Assender's determination to lay down a hard-and-fast rule to supply none other than actual wholesale dealers, and personally supervise every parcel of limes which leaves his factory.



## Answers to Correspondents.

- \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.
- \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.
- \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

- A. J. Ashbolt, 10, Exmoor-road, Southampton.—Photograph of D. Greenlees.  
 J. Robb, sen., 164, Springfield-road, Glasgow.—Photographs of Royal Infirmary, Glasgow; Belvedere Hospital, Glasgow; Centre of Glasgow Necropolis; North end of Glasgow Necropolis; Infirmary-square and Castle-street, Glasgow; Infirmary-square, Glasgow; South end of Glasgow Necropolis.

RECEIVED.—"GUILD;" WILKINSON & Co.; F. E. G.; TRICOLOUR; "NEMO" and others. These in our next.

R. E. WILKINSON.—We have forwarded your letter.

A. S. MARSHALL.—It is against our rules to recommend particular makes of apparatus, but we believe the camera named to be excellent value.

HURSTPIERPOINT.—We believe the firm named to be respectable. You appear to have addressed your letter to Tottenham; it should have been Nottingham.

HIRE OF APPARATUS.—VISITOR. Both Messrs. Morley & Cooper, and Sands & Hunter, we believe, lend apparatus on hire. The address of the former firm is, 70, Upper-street, Islington, N.; and the latter, 20, Cranbourne-street, W.C.

ASCERTAINING COPYRIGHT.—X. L. The only way to ascertain if the picture is copyright or not is to search the register at Stationers' Hall. If, however, the picture was produced in France or Germany, as you suspect, the register at Stationers' Hall will not contain it. Nevertheless, the picture may be copyright here under the International Copyright Act.

RED TONES ON P.O.P.—H. W. BRYANT says: "Can you oblige by telling me how I can obtain brick red tones on matt or glossy P.O.P., avoiding double tones?"—Only by very slightly toning. When such tones are desired, it is a good plan, after washing out the free silver, to immerse the prints in a weak solution of salt and water for a short time, and then wash again before toning.

PINK TINGE WITH AMIDOL.—W. H. S. says: "I have been developing bromide prints with amidol, and find many are tinged with pink as the one enclosed. 1. How can I avoid this? 2. Should I use a clearing solution? 3. If so, what?"—1. As some prints only are tinted it shows that the cause is in the manipulations. Try more washing after fixing. 2 and 3. Not necessary.

EDINA.—The work is exceedingly good; but, even so, the London labour market is sadly overcrowded, and your chances of improvement would be somewhat remote. In our opinion you would have a better opportunity in a large provincial town. Why do you use such wretched slang terms as "ref," "crib," and "specs?" This sort of thing would certainly militate against you in London.

ADDRESS WANTED.—J. R. R. says: "In the last BRITISH JOURNAL PHOTOGRAPHIC ALMANAC there appeared an advertisement, 'Art Lantern Slides, Braun, Clément, & Co.' Do you know if these can be bought in England?"—We are not aware that they can. The Autotype Company are agents for Braun's paper reproductions, but we are not sure that they are for the lantern slides. Better write them at 74, New Oxford-street, W.C.

BURNISHING.—BURNISHER says: "I should esteem it a great favour if you would kindly give me particulars for using burnisher (roller) for cabinets, &c. (portrait). The one I have is a double nickelled roller burnisher. What is the best paste to use? I have never worked a burnisher before."—The usual lubricant is a solution of Castile soap in alcohol, about two grains to the ounce. Possibly the burnisher does not necessitate any lubricant at all. Some forms do not.

SEPIA TONES ON BROMIDE PAPER.—SEPIA writes: "I should esteem it a great favour if, in your Answers to Correspondents, you could give me a formula for obtaining warm sepia tones on bromide enlargements other than the alum and hypo boiling method."—If you refer to page 180 of our issue for March 24, you will find an article on producing various colours on Velox papers by development only. Possibly, the method there described, or a slight modification thereof, will answer with the paper you are using.

STUDIO EXTENSION.—J. BEALE writes: "I am going to have a studio built in the garden, backing on the house. I propose to have it twenty-three feet long and eleven feet wide. Would there be any advantage in having at the end a pair of folding doors, so that the camera can be placed outside in the garden?"—Yes, certainly. Twenty-three feet is short for a studio for portraiture, particularly with groups, but with the suggested folding doors you will obtain all the advantages of a longer studio when required.

DUST TROUBLES.—SIDNEY B. says: "I am much troubled with dust in my place, which cannot be avoided. When the prints on P.O.P. are drying, the dust sticks to them and cannot be got off. I have had no experience with albumen paper, but would the dust stick to that so that it could not be rubbed off when dry?"—Any dust settling on albumen or collodion prints can be rubbed off when they are dry. Furthermore, albumen and collodion prints may be dried between blotting-paper, so that the dust need not come in contact with them at all.

IRON PRINTING.—OTHELLO writes: "Can you tell me of any iron printing process to resemble bromide, or any method of turning ferro-prussiate paper (blue prints) to a black?"—A long article on the iron printing process appeared in the ALMANAC for 1889, see pp. 367-373; see also Mr. Lambert's series in the JOURNAL a few months ago. These methods are given for producing brown and black tones, but we doubt if any of them will give colours similar to those on bromide paper except the platinotype process, which in reality is an iron process.

EXAGGERATED STEREOSCOPIC RELIEF.—STEREO sends us a stereoscopic slide of a small statuette, and asks the cause of the exaggerated relief in it when seen in the stereoscope. He says the lenses were three inches apart, and other subjects taken with the same camera do not show any too much relief.—The reason for the great relief is that the lenses were too far apart for an object so near to them. By the look of the slide we should say that the statuette was not more than three feet from the camera, possibly less. In this case a separation of the lenses of a couple of inches, or less, would have sufficed.

MEMBERSHIP OF R.P.S., &c.—UPPERTON writes: "1. Will you kindly inform me how to become a member of the R.P.S.? 2. I am about to open a studio in a village where there are a great many amateurs, and intend catering for them in apparatus, materials, &c. Will you please tell me how I am to become a qualified dealer, as the wholesale firms inform me that they cannot supply professional photographers at dealers' rates?"—In reply: 1. The Secretary, 66, Russell-square, W.C., will send you particulars. 2. We imagine that, in order to secure dealers' terms, you must relinquish professional photography, and trade as a dealer pure and simple.

STUDIO REPAIRS.—O. P. Q. writes: "I find my studio leaks badly in the roof for want of paint. I have applied to the landlord, and he refuses to do what is necessary, saying it is my place to do the repairs. I have had the place two years, and have it on a seven years' lease. Is it not his place to do the necessary repairs when they are required?"—We should say certainly not on a seven years' lease. Leases are generally granted on the condition that the tenant keeps the premises in good repair, and also that he leaves them in such. No doubt if our correspondent reads through the lease, he will find that he has covenanted to do so.

RESIDUES.—AMATEUR says: "I have been saving my residues for some time past, and I now think I have sufficient to yield four or five ounces of silver, according to my estimate. Will you kindly tell me the best refiner to send them to?"—We must refer this correspondent to our advertisement columns, it being against our rule to recommend any particular advertiser. We might say, however, that "Amateur" would do well to let his residues accumulate until he gets more. Four ounces of silver at its present price will not realise more than about nine or ten shillings, according to the purity, and after the cost of reducing is deducted there will not be much left.

RESIDUES, &c.—A. P. S. asks: "1. Can you give me the address of Captain Abney? 2. What is the quickest means of throwing down silver from (1) old amidol developers and (2) from hypo? We have about 200 gallons of hypo per week, and our tubs cannot clear themselves quick enough. We are at present using scrap zinc. Any information on the saving of waste in chemicals and paper will be gladly received."—In reply: 1. Science and Art Department, South Kensington, S.W. 2. There is no silver in the developer to throw down. 3. In place of the zinc add a solution of sulphide of potassium, that will precipitate the silver as a sulphide. Care must be taken that no more is used than is necessary, as an excess will redissolve it. Add the sulphide carefully, and when it ceases to cause a further precipitate, stop.

YELLOWED WHITES OF PRINT. ANXIOUS says: "Enclosed is a cabinet print. It has been exposed under a mount in show-case for one month during summer, where the sun from sunrise to mid-day was full on it. You will observe that the unprotected whites have yellowed. Is this due to faulty manipulations, or would any vignette go in a similar way under the circumstances? Also please give your opinion of photograph as a specimen of commercial photography produced in studio 15x8 feet."—Yes, faulty manipulation is the cause. There is no reason why vignettes should go in a similar way if they are properly treated. See leading article in the issue for the 29th ult. The photograph is fair. The fault of it is, the face is too flat, through too strong a front light being employed. Stop off more of that, so as to obtain greater *chiaroscuro*.

TEST FOR HYPO.—R. H. S. says: "1. Could you give me a reliable test for hypo, and correct proportions for use with bromide papers? 2. We use 1 cwt. to 80 gallons of water, and mix fresh every three days. It is in constant use, about 500 yards, 18 inches wide, passing through in each day. I do not think it necessary to use it at such a strength or change it so frequently, as it is sometimes quite clear when thrown away."—1. Two very delicate tests for hyposulphites are given on pp. 975 and 976 of the ALMANAC for the current year. 2. The solution is a trifle weaker than is generally used. We should think it is very inadvisable to use the solution even the second day if the stability of the results are a consideration. Hyposulphite of soda is very cheap. Read the leading article on this subject on p. 611 of our issue for September 29.



# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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## THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1900.

Edited by THOMAS BEDDING, F.R.P.S.

THE thirty-ninth annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1 next. Its preparation is already receiving attention. This year's ALMANAC reached a total of 1508 pages, and the entire edition of 20,500 copies was sold out within about three months of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past ALMANACS have been received is the surest proof that the lines upon which that publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1900. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the ALMANAC in directions which may occur to our readers as susceptible of improvement.

The ALMANAC for 1900 will appeal to photographers all the world over as a daily reference guide in practical work. The formulæ will be revised where necessary, and the latest departures in theory and practice will be chronicled. The year's

advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages of the 1900 ALMANAC. Those of our friends intending to co-operate with us in this respect will oblige us by letting us have their MS., sketches, &c., at the earliest possible date.

Secretaries of societies will also oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us as early as possible.

The publishers ask us to remind advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

## EX CATHEDRÂ.

THE Head Master of the Orange-street Board School, Southwark, London, S.E., writes to us as follows: "In this large Board school, situated at the very centre of the most poverty-stricken district of London, we find great difficulty in attracting the poor lads and interesting them in their lessons. They go to work before, between, and after school hours, and have no opportunity for relaxation or self-improvement out of school. I have induced the School Board to fit one of my rooms with cased-in black blinds, and am striving to awaken an intelligent interest among the boys by the free use of lantern lessons, but the slides at my disposal are very limited in number and range of subject. I am sure many of your readers have slides (or negatives from which I can make slides) of places possessing geographical, historical, or Biblical interest, or illustrating geographical terms, industries, &c., for which they have no further use, but which would be of great value for my purpose. I shall be most thankful to receive any which the kindness of your readers may induce them to send. I should also be glad of any discarded lantern large



enough to allow the use of incandescent light (my own iron one being unsuitable), or lantern-slide making apparatus, and would gladly pay carriage if desired." We are sure that many of our readers will be pleased to help in this good and humanising work. Those of them who do not know the Orange-street district can have no conception of the squalor, misery, and ignorance by which it is characterised. Lantern slides, negatives, and (may we add?) the discarded lantern asked for, should be addressed to the Head Master, Board School, Orange-street, London, S.E.

\* \* \*

MR. R. W. CRAIGIE, the Hon. Secretary of the Photographic Salon, informs us that the pleasant little annual function known as the "Salon Smoking Concert" takes place on Tuesday evening next, October 17, at the Dudley Gallery, Egyptian Hall, Piccadilly, W. The entertainment will be chiefly provided by members of the Savage Club.

\* \* \*

THE International Congress of Photography is to be held in Paris from Monday, July 23, to July 28, 1900, and form the third International Congress following those held at Paris in 1889 and at Brussels in 1891; its purpose is: 1. To re-examine decisions arrived at by the two last Congresses on problems before the Society, and to investigate if such are capable of further improvement or perfection. 2. To inquire into the various new photographic questions arising since the last meeting. Practical demonstrations of working methods, lectures on special subjects, and visits to scientific and industrial institutions are included in the programme. The fee for membership is fixed at 10 francs, and the funds derived will be used to defray costs of printing, correspondence, and all incidental expenses of the Congress. Those intending to be present are requested to address the General Secretary, Monsieur S. Pector, 9, Rue Lincoln, Paris. On the termination of the Congress the official reports of the sessions will be published, and a *résumé* of the transactions forwarded to all members.

\* \* \*

THE Second Traill Taylor Memorial Lecture will be delivered by Major-General Waterhouse on Tuesday evening, November 14, at the rooms of the Royal Photographic Society, 66, Russell-square, London, W.C. The subject will be "The Teachings of the Daguerreotype."

\* \* \*

MESSRS. G. WEST & SON, the well-known marine photographers, inform us that their lantern lecture, "Our Navy," has been cruising through England and Scotland during the past nine months, showing by means of animated photographs how a lad is trained from his entry and becomes an efficient bluejacket. In each town it has been received with great enthusiasm, and the Press have given it all commendation and encouragement, recognising the patriotic sentiment it draws forth and the vast amount of good it must be doing in showing what very few people have opportunities of witnessing, viz., "Life in the Royal Navy." It has further created a very strong impression in the minds of young lads, as, for instance, there were forty at Newcastle and eighteen at Sheffield applied to join the Navy after having seen it; thus it may be almost looked upon as a national recruiting agent. The lecture

is to be given in the afternoons and evening at the Polytechnic, Regent-street, commencing Saturday afternoon next, October 14.

\* \* \*

*Shamrock*, the yacht which is endeavouring to wrest the America Cup from the possession of Brother Jonathan, was photographed before her departure from New York by Messrs. G. West & Son. A reproduction of the photograph is published by Messrs. Marion & Co. of Soho-square. There should be a very large sale for this picture, as the interest in the struggle appears to be world-wide.

\* \* \*

THE well-known photographer, Mr. A. H. Fry, of the Royal Pavillion Studio, Brighton, sends us his twenty-four-page catalogue of photographs, the subjects comprising royalty, political, clerical, dramatic, educational, literary, musical, and sporting celebrities, cathedrals, abbeys, college chapels, churches, schools and public institutions, country mansions, and places of interest. The catalogue is very nicely arranged. We often wonder that such a comparatively small number of photographers take the trouble to catalogue their photographs of celebrities and prominent people: the practice should prove both useful and remunerative.

\* \* \*

THE Hon. Secretary of the Hackney Photographic Society asks us to notify intending contributors to the Hackney Exhibition who have photographs at either the Royal or the Salon Exhibitions now open, that they may have their photographs collected free of charge by the Hackney Society. Entries for the latter Exhibition close on the 21st inst.

\* \* \*

We have often objected to the term "photograph taken in the dark" applied to the interesting results obtained by Dr. W. J. Russell by means of the exposure of a sensitive plate to the exhalations from various metals and inorganic bodies, and subsequent development, and we are glad to see that the learned Doctor himself is now taking exception to the misnomer. He thus writes to last week's *Nature*: "I see in your issue of September 21 (p. 513) the statement that I am to lecture at the Royal Victoria Hall on "Photographs Taken in the Dark." I beg to say that the title I gave for my lecture was "Pictures Taken on a Photographic Plate in the Dark." I suppose the authorities at the Hall consider the titles identical. I do not." Neither, of course, does any one with a knowledge of the subject. However, if Dr. Russell's valuable experiments and results are not strictly photographic in the sense commonly understood, they at least throw many new and instructive lights on the susceptibility of the silver haloids to reduction by various causes.

\* \* \*

OUR contemporary, the *Pharmaceutical Journal*, gives particulars of a radiograph of an injected full-term foetus, which has been taken by Mr. F. H. Glew, chemist and druggist, Clapham, and which is said to be a remarkable example of the valuable results that can now be obtained by the use of the Röntgen rays. The foetus was injected by Mr. Charles Ind, of St. Thomas's Hospital, with mercury, the fluid being introduced by means of a hypodermic needle, connected by stout



rubber tubing to a funnel capable of holding two fluid ounces, and elevated above the level of the needle, in a suitable holder. The radiograph was taken directly the injection was finished, so as to prevent the mercury gravitating to the lowest level. The subject was arranged on a piece of thin cardboard over a Thomas Al plate, and the focus tube fixed over the middle of the plate, with the radiant point twenty-four inches distant. An exposure of twenty minutes was given, with a current of three amperes through a ten-inch Appa's coil. In the radiograph, the aorta, left side of the heart, kidneys, and spleen are readily recognisable, and the vessels of the neck and extremities are especially clear.

### THE FUTURE OF FILM PHOTOGRAPHY.

WITH the advent of new claimants to favour in the form of emulsions supported on other surfaces than glass, it is opportune to inquire what is likely to be the future of flexible films. The advantages of a support other than glass have been insisted upon again and again—reduced weight, no breakage, absence of halation, printing from either side of the negative—but the fact remains that, if the question of films *versus* glass turns up among half-a-dozen practical photographers who know what they are talking about, the consensus of opinion will be something like this: Yes, theoretically glass is doomed, but in practice we find it so much more convenient and certain that we prefer to put up with its alleged disadvantages. This, we say, is the kind of opinion that one gets from practical men who want negatives when they expose plates and want a good negative every time. They are ready to admit that glass has not a few disadvantages; and so, it is also urged, have the paper or celluloid films which seek to replace it.

The chief objection—and an extremely reasonable one—is the absence of a really light and compact dark slide for holding the sensitive film. Film-holders there are, it is true, but they are most of them irritating in use, and, when added to the weight of the film itself, very considerably discount the gain in lightness, which is a distinguishing feature in the argument for films. Then, in the larger sizes, it is difficult to ensure the film lying flat. Cut films, it seems to us, occupy just at present the unfortunate position of being before their time. They stand in need of a specially constructed light and thin dark slide, in which the film can be held taut and flat without such cumbrous makeshifts as backing cards, tacky supports, sheaths, or the other devices hitherto in vogue.

A form of slide which suggests itself to us as a possible type is one in which one end of the film can be clasped in a spring clip, extending across the base of the slide, and the other likewise inserted in a similar clip fixed in the upper end, and capable of a slight adjustment sufficient to stretch the film flatly in the focal plane. Considering the truly marvellous ingenuity displayed in the construction of photographic apparatus, it is not unreasonable to believe that some such device as we have roughly outlined may be obtainable at no distant date. It ought to be practicable to construct dark slides to take two paper or celluloid films, back to back and separated by a piece of thin card, in such a fashion as to greatly diminish the thickness of the slide. As soon as it is a certified fact that twelve film slides occupy only the space of, say, six plate slides, one of the greatest obstacles to the general adoption of films will have been removed.

It must be realised, too, that in the after-processes of development, fixing, and washing, all that is possible must be done to smooth the photographer's path. It cannot be denied that special difficulties, or perhaps we ought to say, special inconveniences, attend the use of films at these stages, and this must be taken into consideration alongside of another fact that photographers, when they take up a new process, are exceedingly prone to work it exactly as they did the one which they discarded for it. The troubles which attended the change from albumen to gelatino-chloride are evidences of this. Disappointment is likely to ensue when it is found that films cannot be treated quite in the rough and ready fashion that a plate can, and that those old and perchance forgotten evils, frilling or blisters, may arise through the neglect of precautions which the perfection of dry plates has long rendered unnecessary.

The washing of film negatives is a point which those interested in exploiting films might well consider. It is difficult to scamp the washing of a lot of negatives provided they are somehow or other arranged in moving water. Give them a reasonable time and they are pretty sure to be freed from hyposulphite; but in the case of films there is the same danger as with prints, that they will be left to soak in clots, or that, when washed in a "washer," they may get damaged; and, while a spoilt print only means the trouble of taking another, a spoilt negative may mean, and generally does, a good deal more. For this reason we are inclined to think that a negative film-washer of good design is a piece of apparatus of which there is need.

**Lightning Photographs.**—This subject continues to attract attention among the readers of *Nature*, and in the last issue for September will be found an illustration from a photograph of a very interesting character taken in Johannesburg. Mr. C. E. Stromeyer, who sends the photograph, thinks it indicates that the camera moved during exposure, as there are nine distinct lightning flashes, all of identical shape. Doubt is thrown upon the existence of ribbon lightning at all, while Mr. F. H. Glew draws attention to the "Clayden effect," described by him before the Royal Photographic Society in the earlier part of this year. This effect, it may be remembered, explains the appearance of so-called dark flashes which that writer believes also not to have an objective existence, but to be produced by the reversal of image produced on a plate "fogged" by a previous exposure to light. Mr. Glew refers to photographs of a four-inch spark, and the reversal effect producible at will by previously exposing the plate to the light from a piece of white cardboard illuminated by burning magnesium wire. This exposure is made both before and after the photographing of the spark image; but it is in the latter case only that the reversal appears.

**Photography and Telegraphy.**—According to the Vienna correspondent of the *Times*, photography is assisting in the making of a revolution in telegraphing. Telegraphing took place between Berlin and Buda Pesth at the rate of no less than 220 words in ten seconds. The result of this trial upon the minds of the experts who were present was distinctly favourable. The mode of working was as follows: A perforated roll of paper similar to that at present in use is employed for the despatch of the message, which is made visible and fixed photographically at the receiving end of the wire. Instead of the dashes and dots of the Morse alphabet, there are rising and falling strokes starting from a horizontal line. The receiver consists of a telephone fitted with a small concave mirror, upon which are reflected, in the form of streaks of light, the impulses marked on the membrane. By an ingenious arrangement, reminding one of cinematograph work, the streaks of light reflected upon the



mirror are reproduced upon a roll of sensitised paper, thus giving a narrow oblong picture, which, under the present stage of the invention, is developed and fixed like an ordinary photograph.

**The Relic of Andrée.**—The buoy marked Andrée Expedition, which was found by a Norwegian vessel on the north coast of King Charles Island in September last, was opened one day last week at Stockholm. That was carefully done in the presence of several experts and ministers, and it was found that the buoy was what was termed the North Pole buoy, which the explorer was to have dropped when passing the Pole. In it was found some sea sand and some water, and in an inner tube was a coating which seemed at first to resemble paper, but a microscopical examination showed that it was only a growth of algae. Professor Nathorst expressed the opinion that the buoy could not have been carried from the Pole to King Charles Island. The general impression was that the buoy had been thrown out empty—possibly to lighten the balloon. It has been decided that a search will be made at King Charles Island next year. There seems to be no doubt that this is a genuine relic of Andrée's Expedition, but it unfortunately leads to no clue as to its fate.

**Separation of the Haloids.**—An article by M. Bougalt on this subject given in the *Chemical News*, as abstracted from the *Journal de Pharmacie et de Chimie*, contains some practical remarks, although they do not possess, as the writer imagines, the element of novelty, for only last week we quoted in our LANTERN SUPPLEMENT Professor Valenta's method, which is identical in principle, though not so full of instructions as to precautions to be taken. M. Bougalt, alluding to the many methods that have been proposed for making these estimations, says the text-books suggest "at best an indirect method, which comprises the three following operations: (1.) Precipitation by nitrate of silver and weighing the mixed precipitate; (2.) Conversion of the whole of the argentic precipitate into chloride of silver, and weighing the chloride of silver formed; (3.) Separation of the iodine either by precipitation with chloride of palladium, or by setting it free by means of an oxidising agent, and removing it by means of sulphide of carbon. In the case of the presence of two halogens only, it is evident that the two first operations will suffice." He then points out, with regard to the second operation, the simplicity and exactitude of the method we allude to, which we have not found "described anywhere." He uses absolutely pure granulated zinc, which can be obtained commercially, and, taking a small quantity of the argentic precipitate, adds to it about fifty times its weight of ten per cent. sulphuric acid, and gradually adds portions of zinc till about the weight of the precipitate has been used (each addition to be dissolved before adding a further quantity. It is indispensable that the whole of the zinc be dissolved.) Then filter and wash with distilled water. The precipitate collected is pure silver. The filter and precipitate are ignited in a crucible, and, allowing for the ash, the actual weight of silver is found. From this the proportions of the respective bromide and chloride, or iodine and chlorine, can be calculated by the usual methods. M. Bougalt states that he has obtained absolutely exact results when working with mixtures containing forty or fifty per cent. of iodine, with only five or six per cent. of chlorine.

**Another Death by Cyanide of Potassium.**—In our issue of last week we alluded to a suicide by means of cyanide of potassium, purchased for alleged photographic purposes, and incidentally mentioned that deaths from this poison were of much less frequent occurrence than formerly. Singularly enough there has been another case since. It appeared that the deceased was a silver-smith, and had been arrested for felony, and was searched at the Marlborough-mews Police Station. On him was found a lump of white material, which he told the police was "sugar," and he was allowed to keep it. When in the cell he commenced to eat it, and almost immediately fell to the ground. When removed to the Middlesex Hospital, the doctors found that he had poisoned himself

with cyanide of potassium. That salt is used more by silversmiths and the like than it is at the present time by photographers, and still more largely by electro-platers. Sugar and the cyanide are not much alike in appearance, and it seems a little remiss on the part of the police that the difference was not noticed. They certainly could not have smelt it.

**The City Art Gallery.**—Slowly the Corporation of the City of London are acquiring a valuable Art collection. We learn that the picture, painted by Mr. A. C. Gow, R.A., representing the brilliant scene outside St. Paul's Cathedral on the occasion of the Thanksgiving Service on Jubilee Day, 1897, and which was shown in the last Royal Academy Exhibition, is to be presented to the Lord Mayor as representing the Corporation, and hung in the Art Gallery of Guildhall on Wednesday next, the 18th inst. The donor is Mr. Henry Clark, and this picture is an excellent *souvenir* of that memorable event in the City, as well as a fine work of Art. The Corporation are gradually acquiring an Art collection that it is hoped will be a credit to the first city in the world. A really good Fine Art Gallery in the heart of the busy City might almost be compared to an oasis in the desert.

**Process Businesses.**—We see from the City News and Commercial Intelligence of a daily contemporary that the Directors of Carl Hentschell, Limited, the well-known process workers, have acquired the whole of the shares of the Meisenbach Company, Limited. The capital of the latter Company is 10,000*l.*, fully paid up. These two Companies are amongst the best process workers we have in this country, and are not amongst those who are "cutting the trade" in the matter of prices.

### THE TONING OF BLACK IMAGES.

ALTHOUGH every one recognises that there is a fashion in dress, it is not so generally recognised that we have fashions or cycles in almost everything else as well. Years ago croquet was the game that was played on private and public lawns, but this was ousted by lawn tennis, and now the years have revolved, and croquet seems likely to hold its own again.

As in our games and sports, so in our hobby of photography. Years ago black images were all the rage, then came the red-brown tones, mostly of uranium-toned bromides, then a wave of black, flat, lifeless tones ensued, and now it would almost seem that we were going to revert to browns, though of a somewhat darker shade than before.

The numerous "gaslight" bromide papers on the market, and the formulae for obtaining warm tones, seem to point to a tendency to the warmer tone, which, though it can be obtained with certainty and ease when working with one negative under absolutely constant conditions, is not so easy when numerous negatives are printed from, and only one or two prints required from each.

The following methods, which are by no means new, but merely old ones modified as experience has proved, are the most satisfactory for toning black images, whether on paper or glass, in the form of lantern slides or transparency.

The most usual method of obtaining reddish-brown and sepia tones is by means of a uranium salt and ferridcyanide of potassium. The chemical action which takes place in toning is, of course, the formation of ferrocyanide of silver and ferrocyanide of uranium, the latter being precipitated upon the image in a form insoluble in water, but readily soluble in an alkali; hence it is usual to acidify the toning solution, and also to acidify the washing waters. The best acid is undoubtedly acetic, because it has no action on the silver image or upon the toned image.

In all the toning formulae which I shall treat of there is one common solution, that of the ferridcyanide, which is best made up in a one per cent. solution with ten per cent. of glacial acetic acid.

The uranium salt generally used is the nitrate, but it is better to



use the acetate, and a one per cent. solution of this, with ten per cent. of glacial acetic acid, forms the necessary stock solutions.

The tones obtained by these solutions varies somewhat according to the proportion of the ferridcyanide and uranium, as there are two distinct ferrocyanides of uranium, which are precipitated the more readily when the above solutions are mixed in definite proportions.

For sepia tones an admixture of one part of ferridcyanide solution and two parts of uranium solution is the best; for reddish-brown tones, one part of ferridcyanide solution and one and a half parts of uranium solution; whilst for bright red tones equal parts of ferridcyanide and uranium solutions should be used.

There are certain precautions to be taken when using these solutions, notably, the absence of hyposulphite, and it is advisable to treat the print or image to a bath of ammonium persulphate (one per cent.) before toning. Then, again, in toning for reddish-brown or bright red, the prints should be allowed to lie perfectly still in the dish, or otherwise some of the image, which is in a readily soluble state, may be dissolved.

Considerable variation of tone can be produced by varying the time of immersion, as, for instance, by merely immersing a print in the bath destined for bright red tones for a short time, a warm sepia is obtained, but the image is certainly more liable to change when in this condition than if the proper bath is used, and the baths are so compounded as to give the correct tone, no matter how long the prints are immersed.

As I have already pointed out, these images are soluble in alkalies, and therefore it is advisable to a great extent to acidify the washing waters with acetic acid.

All the above, and the following toning solutions, are more or less sensitive to light, and should therefore be kept in the dark.

This toning process is essentially an intensification, and, should the print be too heavy when intensified, it may be reduced in intensity without alteration of colour, by immersing for a short time in a ten per cent. solution of ammonium sulphocyanide, rendered faintly acid with glacial acetic acid, which dissolves the white ferrocyanide of silver without affecting the uranium salt. This process is particularly valuable for lantern slides, as it leaves only the uranium image, which is much more translucent than the opaque ferrocyanide of silver, hence the shadows are much clearer.

Blue or greenish-blue tones are not much sought after, but they are specially suitable for some subjects, particularly in the form of lantern slides, when they make a welcome change from the interminable blacks and browns.

The same ferridcyanide solution is used, and the second solution is a one per cent. solution of ammonio-citrate of iron with ten per cent. of glacial acetic acid, and these two should be mixed in the proportion of one part of ferridcyanide and one-and-a-half parts of ammonio-citrate. By prolonged immersion the image becomes quite a bright blue, and for lantern slides this looks almost like a stain of an aniline dye if the ferrocyanide of silver be dissolved out with hypo, which has no effect on the blue image.

Numerous shades of pure green or greenish-blue are to be obtained by mixing the ferridcyanide, uranium, and iron solutions in equal parts, and varying the duration of toning.

For a rather rich brownish sepia there is no bath so easy to use as the ferridcyanide and molybdate of ammonia in one per cent. solution, in equal parts, and this has the advantage over uranium toning in that the prints can be washed in ordinary water.

Copper has been suggested as a toning agent for bromide prints, but some prints thus toned six months ago have altered considerably, so that no great reliance can be placed on the permanency of this process. The best method is to dissolve ten parts of acetate of copper in one hundred parts of water, and add sufficient of a ten per cent. solution of oxalic acid to precipitate the whole of the copper, then to pour off the supernatant liquid, and add sufficient neutral oxalate of potassium to dissolve the precipitate, adding enough water to make one hundred parts in all.

An intensification process, which also gives a brownish-black image, is to bleach the image in mercuric iodide solution, and then to treat with a one per cent. solution of Schlippe's salt.

The various methods of lead toning are so unreliable, because of the difficulty of removing all the salts from the fibres of the paper or from the gelatine, and also because of the enormous intensification that they give, that they should never be adopted.

A. D. PRETZL.

## ACTION OF LIGHT UPON METALLIC SILVER.

[Paper read before the British Association, Section B.]

FOLLOWING on the lines of Moser's thermographic observations, it may be asserted that metallic silver is sensitive to light. If cut-out masks be laid upon the surface of silver leaf or foil, silvered glass, or on a Daguerreotype plate, and exposed to the sun's rays, a visible image ultimately becomes apparent on the metallic surface. The effect may, however, be got in a very much shorter space of time if the partly exposed metal be subjected to mercury vapour, or developed by immersion in an acid solution of a ferrous salt mixed with nitrate of silver. Clear images, hardly as yet to be called pictures, can thus be obtained of a permanent character, so that it may be possible to work the Daguerreotype process without iodising the plate. In fact, the photographic phenomena of the invisible developable image, the visible image, reversal, and the effect of pressure marks can all be illustrated on the plain silver surface.

This, at least, is a new discovery.

Copper seems to be sensitive in the same way, and, doubtless, other metals.

P.S.—To avoid contact, a thin sheet of mica was interposed between the silver plate and mask in the experiments without appreciably affecting the result. MAJOR-GENERAL J. WATERHOUSE.

## BLUE PRINTS.

THE ferro-prussiate, or blue process, introduced by Herschel nearly sixty years ago, finds many applications at the present time, the latest of which we gave in our columns last week in the *Foreign News and Notes*. In this instance it is lined on zinc plates in connexion with three-colour printing, but only as a guide to the artist to make colour drawings, as in chromo-lithography or chromo-zincography. There is another "blue process," which is utilised for a somewhat similar purpose, though it is entirely different from that just referred to, and is largely used at the Ordnance Survey Office at Southampton. As it may not be familiar to many of our readers, or, possibly, to some who work photo-mechanical processes, we will give a brief outline of its application.

The Ordnance maps, it may be explained, are all drawn accurately to scale, so accurately, indeed, that in the case of large towns, which are drawn to a scale of a little over ten feet to the mile, even such things as the street lamp-posts are shown at their relative distances apart. From these drawings the maps are reduced to different scales by photography, and printed by photo-zincography. The parish maps are on a smaller scale—a little over twenty-five inches to the mile. Now, it will be seen that, if any of these large scales be considerably reduced, say to one inch to the mile, the finer details, the names of the roads, lanes, &c., would not, by reason of their fineness, be rendered distinctly readable, and consequently they have to be emphasised. That is done in this way. A print on the large scale is taken from the zinc plate in a very pale blue ink. The artist then traces in the finer details, much bolder, in a strong black ink with a ruling pen, keeping a little outside the lines in the original. Then the names are put in on a larger scale—indeed, the map is reproduced in black on a bolder scale, the blue print merely serving as a guide to accuracy.

When all is finished, this map is photographed to the necessary scale, and, as the pale blue ink is of such an actinic colour, it is not distinguishable from the white ground of the paper in the negative. We allude to this "blue process" now, because it serves much the same end as that given in our previous issue, and may be useful to some who may not be familiar with it.



### "LYING ABOUT, CARELESS-LIKE."

We have not heard so much of late about "Darkest Photography, and the Way Out," nor do our papers fill up with the financial woes of the poor struggling professional photographer. We must take it, I suppose, that things are jogging along in the usual way; if it does not run to sausages for supper, at least there's bread and cheese. I have often wondered what amount of good resulted from these agitations, whether any professional benefited to the extent of a shilling. But, as Kipling says, that is another story, and, as the office boy puts it, "things as is, is," and from this latter emphatic utterance there's no getting away, no way out. We have to face every day the business of that day, and, to get on, we must see that it is done properly. It is of no use saying with the Editor of this paper, "It shall be done," if we do not put our shoulder to the wheel and push.

Now I've arrived at the point I wanted. It is not only the business of each day that we must attend to, but our eyes must be always wide open for extras. Do what has to be done, of course, and anything else that presents itself in addition. And here let me say that I am not writing these few lines for Vandyke Fitzjabbars, Esq., artist, or John Millais D'Ancy, art photographer, each with their art galleries and decorated reception rooms who do nothing under 2l. 2s. a copy, and so on; who will only operate by special persuasion and provided they have not a bilious attack. No, it is the ordinary or common garden professional to whom I want to say something. True, even he may turn up his nose at it, and in that case let it turn.

I have upon more than one occasion taken down to one or other of our metropolitan societies a match box or a cigarette case containing in the front a photograph; and I have gone so far as to suggest that there might be a little business in this sort of thing. The usual criticism I have so far met with is that it would be *infra dig.* Well, now, I feel in for a dig at some of our plodding professionals, that they do not keep their eyes open for extras. "What! sell match boxes?" they cry; "crushed snakes, what next?" But suppose, good sirs, a customer picked up a match box, admired it, and asked where he could get one like it, would it be asking too much for you to say that to oblige him you would put his photograph in one? You see I am putting it very mildly, as I have no desire to trample upon your feelings more than I can help. But, then, forsooth even an artist uses matches, and it would not be too utterly barbarian if a box should just chance to be handy for the convenience of a customer.

But, then, what about ladies? They don't smoke, you say, and—well, the less I meddle with that matter the better. But there's no harm in confessing that *all* my cigarettes are not smoked by—myself. That's diplomatic, I think. Well, even for ladies the matches might be taken out and pins inserted. No one can go wrong on pins, they are a female commodity of considerable importance, whether the double barrel variety for the hair, or the sharp-business-pointed-keep-everything-up sort.

I'm afraid in my old age I am getting rather Abraham Bogardus. But to come to the point. There are a number of metal boxes now sold with glass lids, and the commoner kinds are made oblong and round, and in about four sizes each. They are intended for the exhibition in shop windows of small things, such as drawing pins, hair pins, collar studs, &c. They are strongly made, look very well when new, and cost but little. A little frame of metal, readily removable, holds the glass in position. Now, it is the easiest thing in the world to squeegee down a silver print upon the glass, and at once we have an extra not to be despised by any one. The round patterns are more suitable for ladies' use, but those I have used for some years now fit in very well for gentlemen. The smallest size is a wax match box, the next a card case, and the largest a cigarette case. I have had one matchbox in use for five years, and a cigarette case for at least three years. Even if the glass breaks, it is easily replaced. The prices of the boxes are approximately 2d., 3d., and 4d. each, bought singly, but, of course, by the gross it would come out much cheaper.

The sight size of the cigarette case is  $3\frac{1}{2} \times 2\frac{1}{4}$ , very nearly an ordinary C.D.V. print. And may I put it before you how nice a small vignettéd carte head looks in this framework, one of those heads you pay 6d. for when you put the retouching out, with the postage extra. Poor girl, she has to stipulate *that* extra. Just think how pleasant the surprise at receiving from the man sweetheart a nice pin box with his photo, or from the female sweetheart a convenient cigarette case with her portrait. In matters connected with unmarried people especially, you professional photographers need to keep your eyes wide open, there's money in it.

You buy a little box for a little 4d. and sell it for a big shilling say, meanwhile you have merely printed an extra copy of a dozen order and stuck it down to the glass instead of mounting it. *Infra dig.* Where does it come in? You please a customer and pocket the shilling, that customer comes back and you pocket more shillings. Surely *infra dig.* can be swallowed at a shilling at a time.

I have sent the Editor one of these boxes for use as a cigarette case, and, as I should do were I a professional photographer, I have inserted in the lid a photograph that is interesting to the recipient.

Christmas is coming again this year, and for gifts these things are

most suitable. Local views could, of course, be utilised, but it is in the personal the application lies.

So have some of these boxes lying about, careless-like, on the table. You'll find them pay you. WALTER D. WELFORD.

### DOUBTFUL TENDENCIES.

(Paper read before the North Middlesex Photographic Society.)

PHOTOGRAPHY, as most of you are aware, was originally discovered by the Chinese some five centuries before the Christian era, just previous to the discovery of the mariner's compass, gunpowder, wireless telegraphy, and several other useful inventions, which, though lost at the fall of the Bang Foo dynasty, have fortunately been rediscovered in modern times. A hand camera found in an Egyptian tomb, and the interesting ruins of a dark room at Pompeii, show that the Western World was familiar with this art. The only reference to photography in any classic author that I am aware of is that beautiful passage in Juvenal, "Camera obscura lignea ect, bonus bona bonum." This apparent lack of interest in the subject amongst the Latin poets is perhaps explained by the fact that, beyond a few photographers burnt by Nero for snap-shooting him, no encouragement was given by the State to this beautiful art. At the fall of the Roman empire the art of photography was lost, and there was no knowledge of it till its rediscovery at the beginning of this century, when a student of the Chinese language, deciphering the inscription on an ancient tea-chest, gave to the world the long-lost art; this happened at Margate, and the earliest experiments were conducted on the sands of that popular seaside resort, which have ever since been a rendezvous for photographers, the leading professionals usually making them their headquarters during the summer months.

In the early days of the revival there was developed a certain amount of ill feeling between artists and photographers, owing, no doubt, to the extreme modesty of the latter; but, as this gradually wore off, the artist recognised in his rival a pleasant comrade, ever ready for an adjourned meeting or a *willie waught*. *Willie waught*, I may remark, is German for whisky, and it is this agreement in taste regarding special Scotch that has cemented the friendship between the two professions. Of late years all has been well between them, with the exception, perhaps, of a little irritation shown by a certain artist and critic who has been troubled in mind because of photographers signing their productions; but even this gentleman was satisfied when it was explained to him that the signatures were only there in case the pictures got lost, and were written large because they might happen to fall into the hands of short-sighted people.

Despite a few such trifling differences, we have gone on in a friendly way, although the photographer, with his usual modesty, has laid claim to all the discoveries in modern art, and, out of sheer bashfulness, thinks that the artist is for ever copying from him. We have overlooked this, we have possessed our souls in patience. The artist may not be modest, but he is patient. That, too, is a virtue; but our patience has been sorely tried of late, owing to the discovery of a strange and mysterious process which has caused, sir, some of your craft to forget even their modesty. You have been kind enough to allow hitherto that the painter has still some slight claim to precedence, but now he holds it no longer, since the invention of this weird and wondrous process.

You must forgive me going into technical matters, but I must briefly explain this process to you. Some paper is taken which is sensitised with blacking and gum mixed in unequal parts; after the usual exposure, or a little more or less, as the case may require, the picture is removed from the frame, then laid in hot water, and developed with a scrubbing brush. This is a very difficult operation, and it is said by some to work easier if accompanied by a little profanity. This, I believe though, is not absolutely necessary. The result is impossible to foretell, but of one thing you may make sure, the print will be nothing like the original negative. I may remark, for the guidance of the young bichromatist, that a print from a negative taken at noonday usually has the effect of midnight, but whether foggy, snowy, stormy, or fine, I cannot, of course, say, as this depends largely on the stiffness of the bristles in the developer, and the strength of the language used. I have here two samples of the gum process. I will not criticise them. I must say, though, that I don't think the *best* gum can have been used. I will pass them round to you, accompanied by two photographs from the same negatives; they serve to illustrate my remarks as to the change of weather and time of day. Since the discovery, or rather revival, of this process, many carbonaceous and unintelligible smudges have been brought into being, and have astonished and delighted those who produced them. I am speaking rather strongly about this process, rather too strongly, you may think, for one who has no practical knowledge of photography. I confess to having seen a few effective pictures produced by it—effective, though not really convincing, and, of course, I may be wrong in my strictures. It may possess capabilities of which I am ignorant, but, judging from results, it produces work that is, to my mind, vague and meaningless,



and without any excuse for being. Whether this is the fault of the process or the worker, it is not for me to decide. I have seen, since I wrote this paper, some gum pictures that closely resembled ordinary carbon prints, mere ordinary photographs, you know, but, of course, these do not come under my criticism, as I am dealing only with high art. Say what you will, a smudge is a smudge, whether it be a pleasant one or not. If you threw eggs against a black fence, you would soon have some erratic, and perhaps pleasing, decoration, but it would not be art. Now, this phase of photography, if we may call it photography, along with a deal of work of the same kind, marks certain tendencies which I have taken the liberty of calling doubtful.

Though photographers are ready to claim a large share in the advancement of modern art, they are apt sometimes to forget that the artistic application of photography has sprung from the study of painting; but, however this study is pursued, it should leave the photographer a photographer. I have chosen the gum-bichromate process more particularly for my abuse to-night, because I feel that in many of these productions the photographer has not felt the necessity of this, and, now that he is able to produce something that is eminently unlike a photograph, he is pleased to think that he has become an artist, and is ready to enter the lists with those who have bound themselves in a lifelong apprenticeship to art. I would point out here that the great and insurmountable difference between painting and photography is not, as is vulgarly supposed, that one is done by hand and in colours, and the other by a chemical process, but that one is the result of the light rays falling upon a sensitive plate, and the other of their falling on a sensitive brain.

Art in its highest form is not a copy of nature, but nature tinged with human personality—in the great picture we have a new view of nature, a view from a fresh standpoint. That a good photographer will stamp his work with a certain amount of individuality I do not deny, but ask yourselves to what extent he may do it as compared with the painter? The painter, I think, has a right to speak strongly against these gum pictures and kindred work, because they are in many cases merely copies of his effects.

Modern art, especially as represented in the school known as the Romantics, has shown us a subtle appreciation of nature that is called somewhat vaguely "quality;" this consists of a suggestion rather than an exact portrayal of nature, and is marked by looser and softer forms than in the more precise art of the past. This, of course, has made it easy for the copyist. The young painter has been long in the field; he soon discovered that his water-colour rubbed with a sponge or sandpaper, or his oil-painting scraped down with a palette knife, had a dim resemblance to the quality got by the modern masters. We have all tried this sort of thing, just as a donkey runs down every blind-alley before he will condescend to trudge along the high road. We recover in time, however. Gum, by the bye, is not quite so sticky as it was a short time ago. The invention, or rather revival, of the gum-bichromate process gave an opportunity to those who were tired of following in the beaten track for trying something original, which, like most other original things nowadays, is just a crib from something else. We have been deluged with impressions in painting, but the wildest, strangest, weirdest impression of all is the carbonaceous one that, with name in corner written larger than ever, is brandished before us, whilst its maker proclaims from the house-top, "I am an artist!"

There may be something pleasant about the mere look of the thing, something fascinating in the rich velvety darks and the wayward spots that are scattered around like the stars in the Milky Way, but personally I prefer photographs. I have seen on these walls, and in the London exhibitions, a great deal of interesting and sincere work that I frankly admit is art. It is photographic art, though, and is certainly not to be confused with painting or drawing, for these mean greater control over method and material than is possible to the photographic worker, and yet, curiously enough, the approximation to the artist's work, which is claimed by some, has been reached by this process, whose principal element seems to be chance. If a photograph is to be modified or altered in any way, the process should be sufficiently under control to make the picture the result of the worker's judgment and feeling. If it be not so, then there is no art displayed and no credit deserved.

I do not think there can be much control in the gum process. If there is, then the pictures I have seen hitherto must be the result of downright deliberate wickedness, and are a strong proof of universal depravity. In other processes, too, there is the same tendency to impressionism. I maintain this is simply imitation of the painter.

Impressionism in its true sense is the most difficult and dangerous part of a painter's craft. It is the getting the very essence out of nature. A true impression looks full—fuller and richer than what is styled finish.

We are told that Millet, the French peasant painter, kept digging away at his pictures when every one else thought they were finished, simplifying them. The most wonderful part of Turner's work is the slight water-colours of the late period. Using the word impression to mean the simplest and broadest painting, it will, of course, include the noblest and greatest drawing, but the usual meaning of the word is the subservience of form to colour. To take, therefore, photography, the chief charm of which is its exact portrayal of form, and to smudge and destroy this form with nothing to put in its place, with no other object than

copying those painters who are inimitable, is an utter waste of time and effort.

I can sympathise with those photographers who are trying to destroy aggressive detail, to keep broad and simple masses. We often see this done successfully, and it can be done without going to the extreme of a wholesale sweeping together, which results in blurred edges and empty dark masses. You must remember in painting there is colour, and it is colour mainly that gives that indefinable quality that in the broadest work is often more satisfying than the greatest drudgery of academic finish. A true impression lacks nothing, except what it is better without. We cannot always say this of the photograph. Let me give a common enough example—a seascape with bright sky, dark sails, and hulls of boats and reflections. In many of these impressionistic photographs the sail, hull, and reflection are the same in tone and quality. Do not, in your efforts after dignity, ignore the slight, but necessary, differences between these things. To throw them all into one is absurd, and yet that is what is done by the gum process, and we are then asked to admire the rich darks.

Coming back to the tendencies again, I may class this very doubtful one and some others under the head of copying painters' effects without having found what they mean by them, and whether they can be rendered by photography at all. If the idea is to be unphotographic, success is often attained, for we are shown prints where everything that is most beautiful and interesting in photography is marked by absence. Let me give you an instance. Harking back to our much maligned process again, at times the blacking is left out, and some brown or red pigment takes its place, and the result is the suggestion of a bad chalk drawing that has been carried in the pocket for some weeks, and, what is so extraordinary, it resembles a bad drawing in the respect of want of form. Things become lumps, and you may often mistake a boat on the seashore for a cow in a clover field. This last statement you must not take quite literally. It is what the newspapers call *on dit*, which is French for a lie; but what I mean is that these things are really bad. Now, what does this mean? I should say that we have been looking at some modern drawing, and, seeing a wonderful effect got by apparently loose and careless touching, off we go for our gum and blacking, and the job's done. But let us remember that behind every quick touch in the drawing was the master's hand, disciplined by long labour, and touched by the gods with cunning beyond the rest of mortals. Nothing is more deceptive than the simplicity of consummate art, but its apparent easiness will mock the strength of our best hours.

You will have already discovered that my tendency is towards wandering. You will excuse me, therefore, saying a few words here on texture.

A highly polished surface is still a source of delight to the greater part of the public. Varnish is like charity, and covers a multitude of artistic sins. A smooth picture will win praise before one in which the brushmarks are shown. There is some reason in this. Roughness for roughness' sake is false. Not many years ago brushmarks were a sort of trade mark on pictures. We used at school to revel in So-and-So's brushwork—of course, in the best pictures you don't think of rough or smooth. They just look right; the roughness in painting was a reaction from the old smooth dead painting of the early Victorian period; and also because paint dabbed on and let alone has a finer quality than when it has been dragged about.

Photography seems still suffering from such a reaction. First we had everything glossy and smooth, but now it is all pimples. The painter, if he uses a rough canvas, may kill the grain where he likes, or, if he works on a smooth one, may make texture just where he pleases; the photographer having to be content with one texture, the grain of his paper, which will show equally all over, it behoves him to choose that judiciously, according to the subject. It has surprised me to see sometimes very beautiful work quite spoiled by coarse granulated paper. This seems curious, but fact or fashion over-rides judgment. Canvas-grained paper or any other peculiar surface may be sometimes used with good effect, but great care is needed, or the result is displeasing. I am afraid the real state of the case is that some successful work is done in some particular way, and there is a rush at once to copy it. Your modesty, no doubt, forbids you admitting this impeachment, but I confess it is so amongst painters.

I wish to-night to treat all the bichromatists who may be present—I'm afraid that's an error—oh, I see—treat them with Christian charity, because I must confess that I myself used to admire these peculiar productions. There is something pleasant about them at first sight, but imagine living with them. Fancy coming home at night, perhaps a little exhilarated, and catching sight of the fantastic shapes. Good heavens! have I got 'em again? but I will draw the veil. Perhaps, though, it is in the seeing double stage when these pictures appeal to the beholder, when to the sober man they appear only foolishness. This may be so. We will not experiment with it, however.

The photographs that give the most lasting pleasure, and I see a good many that, hanging on our walls, would be a source of quiet delight every time we looked at them, are those where the worker, without any affectation or ambition to overstep the limits of his craft, has got hold of his process, and been content to get all the expression he could out of it. Technical excellence must be considered, the particular advantages of the process brought out, and the picture must look, even to the un-



initiated, as if it were the result of thought and care, and not of chance. I am afraid I am slanging things to-night, but any one outsider who takes an interest in photography must blame or praise this peculiar phase of it; it is not to be passed over in silence.

If these things be experiments I would hold my peace, but, if experimental, they should be put into folios or the waste-paper basket, and not brought out as masterpieces.

There is but one test for art, and that is sincerity. It must be begotten of sincere admiration, and produced with sincerity of purpose. If art possesses sincerity, we can respect even where we cannot admire. We must be watchful and ready to receive every new truth, but, on the other hand, we must be careful—and it is one of the great dangers of our modern life—we must be careful not to welcome as a bursting forth of light those things whose only claims to notice are novelty and peculiarity. Hardly a day passes now but we are treated by the press to the discovery of a great artist or poet, whose name will awaken, perhaps, for a moment an echo in the silence of eternity, and we flatter ourselves on the keenness of our perception, but, if a real prophet should be sent us, we should receive him as in the past with indifference or with scorn.

Sincerity is the only test, for art is too wide to be compassed by rules or canons. The crowd that passes through the picture gallery looking for the prettiest will inevitably miss the best, but from honest men sincerity will ever receive respect, which usually ripens into admiration. The old art still stands because it is sincere, and some of the modern for the same reason will endure, though the names that are oftenest in the papers may be forgotten.

Now what is sincerity in photography? The first thing, I should say, is that your work should be a photograph, a literal transcript of nature. Is nothing, then, to be modified or altered in the result that your camera gives you? Yes, to a certain extent. When you bring home your negative, I hope that you bring home, too, a vivid recollection of the scene, and some idea of what you are going to try for in your print; if not, it is no good trying to improve what you have got. Now, I maintain that anything is legitimate that will help you to produce the effect that you are aiming at. You may by knowledge and various methods of treatment get a more pleasing and truer picture than you would otherwise have obtained. I see no objection to hand work even, within reasonable limits—anything you like save fudging. I know it is vulgarly supposed that in painting some very fine effects have been got by fudging, but nothing worth doing was ever done that way. I have used the expression literal transcript in regard to your picture. I do not wish to narrow the bounds of photography, but I would point out that there are bounds, and very firm ones too, for you have brought in nature to help you, and she may bear a little guidance, but will not stand being driven. The light rays under your judgment and good taste produce your picture, you endeavour with limited means of modification to bring this piece of nature's handiwork into agreement with your view and ideas of the scene. This may sound to you like a truism, but it needs enforcement to-day, when there are those about who wish to produce pictures on a photographic basis, and not really photographs. I mean by literal, therefore, that your picture is to be the effect under which the negative was taken, not merely an effect, however pleasing, for the simple reason that you do not start with a free hand. Stand out in the fields with a clean canvas and a flat full of brushes, and you may paint your dreams if you can, but, when you put your head under that black cloth stick to facts, because you must.

I have been told seriously by some photographers that they use their camera as a painter uses his brush; well, they may think they do. Now the bichromatist not only believes this, but a denoted sight more, for he gives himself a licence that a conscientious painter would not think of taking. He messes about till he gets something, but whether he had any idea at starting of what that something was to be is another matter; it is not enough that a thing be brilliant or clever-looking—it must be true to be convincing. If you see something in nature, and try to get it and fail, no matter. You are nearer getting it to-morrow, but don't trust to luck. A good painter would not begin a morning subject, and, if he mess it up, turn it into a night piece. He might by chance get something by doing so, for there is flaking in everything, but it does not want much knowledge to detect it from real play. There are many hazy ideas about to-day that would be better cleared away. One of the pathways to knowledge, according to Confucius, is to know not only what we do know, but also what we do not know. Now, in practical work, before we can make much progress, we have to find out what we can do and what we cannot do, and if gum and blacking should be the means of bringing home to any of us what we cannot do, they will have fulfilled their mission, and we shall be able to go back to photography sadder but wiser men.

It is such a delightful task finding fault with your neighbour, especially when you can persuade yourself that you are doing it for his good, that I feel I must have one more slap, not only at the bichromatist—but at all those who cultivate fuzziness. The judicious softening of certain parts is perfectly legitimate, but to make everything blurred and undefined just for the fun of the thing can only be part of that depravity that is still knocking about in Adam's offspring. The wicked, who have always an excuse ready, will plead some of the great modern painters. Well, go and look at them, and see how much real drawing underlies their soft edges.

HORACE MUMFERY.

## EXHIBITION STATISTICS.

Now that the doors of the Royal Photographic Society's Exhibition have been for some time thrown open to the public, it may be of interest to our readers if we examine, more fully than has hitherto been done, certain figures relative to the number of exhibits and exhibitors at the several exhibitions held during the past four years. It may thereby be possible to gather some information as to the progress or otherwise of the show. The comparisons do not include the exhibits in the Apparatus Section.

Taking, in the first instance, the broad facts of the number of exhibitors and the number of exhibits shown, we get the following table:—

Year.	No. of Exhibitors.	No. of Exhibits.
1896	160	368
1897	172	449
1898	185	429
1899	165	375

From this we see that this year the figures have practically gone back to the level of those of 1896, the difference being merely that of five exhibitors more with seven exhibits.

The year 1896, we believe, was one in which a drastic selection was made by the Committee appointed for the purpose, and it would seem that this year the duties intrusted to the similar body had been quite as rigorously carried out. This is naturally a surmise, but, as we glean from other sources that the numbers submitted were in excess of those for several years past, we can only form two conclusions, viz., either that the standard set was exceptionally high, or that the average of the work rejected was low, and we are inclined to think that the former was the case, judging by the high all-round quality of the work now hanging on the walls.

Still further analysing the number of exhibitors into those who are members of the Society and those who are not, and their respective number of exhibits, we arrive at the following result:—

Year.	Members.	Non-members.	Exhibits by Members.	Exhibits by Non-members.	Average by Members.	Average by Non-members.
1896	71	89	160	208	2.25	2.34
1897	64	108	165	284	2.58	2.63
1898	78	107	202	227	2.59	2.12
1899	72	93	163	212	2.26	2.28

Perhaps the most striking feature in these figures is once again the similarity that those for the present year bear to those for 1896 in every detail: as regards members, who differ by one only, while the number of their exhibits differ by three, and also in respect of non-members, who differ by four only both as regards themselves and their exhibits.

The years 1897 and 1898 are also noteworthy for the preponderance of non-members, and for their similarity in number.

Taking the average number of exhibits shown by both classes of exhibitors, it is certainly a striking fact that it should work out so closely, there being only a difference of 0.51 between the highest and lowest figures.

Turning now to the number of pictures shown by individual exhibitors, we observe that by far the greater proportion are shown by those who have one, two, three, or four frames accepted, the actual distribution being shown below:—

	1896.	1897.	1898.	1899.
Exhibitors with 1 exhibit .....	75	70	71	77
" " 2 exhibits .....	36	45	55	36
" " 3 " .....	20	17	29	23
" " 4 " .....	14	15	13	13

This accounts for 263 exhibits in 1896, 271 in 1897, 320 in 1898, and 270 in 1899, the resemblance to 1896 being once more noticeably exemplified.

Besides these there are several exhibitors who show 5, 6, and 7 and more pictures, these accounting for the balance of the exhibits, the greatest individual number this year being 19.

Of the total number of exhibits the proportion received from abroad is very small, the figures being 25 in 1896, 50 in 1897, 42 in 1898, and 41 in 1899, by far the largest number coming from the United States, viz., 13, 27, 22, and 20 in each year respectively; Italy sent 11 in 1897, 7 in 1898, and 14 this year, this 14, however, representing only 2 exhibitors. Germany supplied 1 in 1896, 4 in 1897 and 1898, and none this year,



Austria 2 in 1896 and 1897, and 4 in each of the two successive years. This year India sends 4, while other countries made up the totals by units.

It appears to us to be somewhat noticeable that more exhibits are not attracted from abroad, inasmuch as the Royal Photographic Society is the leading Society in the world, and in this connexion it would be interesting to know how many frames are actually submitted to the Committee and thus establish what proportion of them come up to the required exhibition standard.

Still further analysing the exhibits, we find that the numbers received from the provinces, as distinct from those sent by persons residing within the county of London, were 155 in 1896, 178 in 1897, 190 in 1898, and 189 in 1899, the distribution of the exhibits into the three categories specified being as below:—

	1896.	1897.	1898.	1899.
From abroad .....	25	50	42	44
„ the provinces .....	155	178	190	189
„ the metropolis .....	188	221	197	142
Total .....	368	449	429	375

Here we have one of the first points of marked dissimilarity between the years 1896 and 1899, which have, we have shown, been otherwise very much alike, that is to say, the increase in the number from the provinces and the decrease in those from the metropolis.

This increase since 1896 of the number received from the provinces is a distinctly encouraging feature, and tends to show, we think, the growth of pictorial workers outside London.

Formerly there existed very few opportunities for provincial workers to keep themselves in touch with the growth and changes in pictorial work, but of recent years much has been done in this direction by the exhibitions, such as those recently held at Bradford and Derby, as well as by the Invitation Sections which has become a feature of most of the provincial shows.

Possibly this drop in the number from the metropolis is merely incidental, but it strikes us it is a point certainly worth noticing, and it remains to be seen whether the same feature will be as prominent in the future.

Examining in more detail the sources of the exhibits from the provinces, we observe that, with the exception of the present year, when she ties with Liverpool, Birmingham has supplied more frames than any other of the large towns, though the number now forms considerably below that of last year.

The actual figures for several other places as well are as below:—

Town.	No. of Exhibits.			
	1896.	1897.	1898.	1899.
Birmingham.....	18	23	43	28
Liverpool .....	12	10	21	28
Glasgow.....	8	11	10	6
Tunbridge Wells .....	5	15	10	6
Leeds .....	6	9	10	10
Manchester .....	1	4		1

We will not touch upon the figures as to printing processes employed, these having already been analysed by two of our contemporaries, but will merely remark that the two most permanent and elastic methods, viz., platinum and carbon, still hold sway, in spite of the claims which have been advanced for other presumably newer and more facile processes.

We may further remark as to the Exhibition itself that the number of small frames is not so great as in former years, there being an apparent tendency to make larger prints, due possibly to a wider knowledge of the use of the enlarging camera, necessitated, we should judge, by the use of a hand camera by men who formerly had used a stand camera and obtained prints sufficiently large in themselves to be able to be exhibited without enlargement.

A consideration of the artistic qualities of the pictures does not fall within our province in this article, being done elsewhere, so we will conclude with a hope that the facts here adduced may prove to be of interest to those of our readers who are fond of detail, not only in their negatives but in other matters also.

#### MELODRAMA'S NEWEST DETECTIVE.

Out of the bourne of time and space has passed one of the most famous figures in melodrama—killed by the onrush of modern science. I refer, says the Paris correspondent of a Sunday contemporary, to the murder-detector and overhearer of all secrets. Every one knows the man. He was frequently Irish, and always wanted to sing and dance during three

acts instead of up and saying what he knew, and so putting an end to the misery of the heroine, and the large, triumphant smile of the villain. Yes, he passed quietly away at a Paris theatre. Those responsible for his demise are M. Meynet and Mme. Geoffroy, and the scene of the incident was laid in *L'Auvergnate*. The play was made up of little bits of all sorts, and was thoroughly amateurish. But the moment came when you held your breath. The wicked woman had committed a murder, and had so cleverly arranged matters that an innocent man was as good as on the Place de la Roquette at break of day. It was no use looking down the programme to find the name of the man who would step forward at the right moment and denounce her, because you could account for each one's time when the crime was committed. One wondered and waited, and the good folk who patronise the theatre seemed inclined to form a committee to go up on the stage and explain matters for no audience in the world takes so serious a view of common justice as does that of the theatre. Suddenly came the click, click, of the cinematograph, and the damning proof of guilt rolled out before your eyes. It is hardly worth asking how it came about that a cinematograph was in the middle of a park when the murder was committed where it could have only been engaged in taking still life. The effect was remarkably dramatic, and, had a skilled playwright led up to this *dénouement*, *L'Auvergnate* would have had a big run before it. Even as it is, the main idea is a vast improvement on old traditions.

#### COLOUR PHOTOGRAPHY AT THE CAMERA CLUB.

THE lecture season at the Camera Club opened on Thursday, the 5th inst., when Mr. Sanger Shepherd was announced to give a paper upon Photography in Colours. The subject is such an interesting one that it attracted a far larger audience than is generally found at the opening nights of the season.

The first note sounded was one of sadness, for, before commencing the business of the evening, Mr. Godfrey, the energetic Hon. Secretary of the Club, made a feeling allusion to the death of one of the earliest members, Professor W. K. Burton, who for many years past has found his home in Japan, after which Mr. Godfrey gave a sketch of the lecture arrangements for the winter, and was able to describe a very varied programme, which included a number of well-known names. The Chairman (Major-General Waterhouse) then said a few words of introduction for the lecturer, and Mr. Sanger Shepherd commenced what proved to be a very interesting discourse.

The lecturer said that the Secretary had accused him of coming before a critical audience under false pretences, for the members expected to have a paper upon the production of a photograph in the colours of nature, and they were to be put off with a kind of back-door method of solving the problem. This was to some extent the fact, but he thought that they would all be interested in the modification of the three-colour system which he was about to describe, a system which, at any rate, would enable them to project upon a screen coloured slides which were far in advance of anything which could be produced by means of brush and pigments.

It was now generally acknowledged that all the colours of the solar spectrum could be counterfeited with sufficient accuracy to deceive the eye by employing screens to filter the light which reaches the sensitive plates in the camera, these screens being respectively red, blue, violet, and green in tint. By employing screens of different colours in the lantern, and associating them with positives obtained from the three-colour negatives, and by carefully regulating the amount of light projected through each, it is possible to get, with fair success, all the tints found in nature.

It is true that the gelatine plate does not translate the luminosities of the different colours as they are seen by the human eye, and it is necessary that the colour screens be adjusted to the particular plates in use. The effect of printing through various coloured screens was shown.

Mr. Shepherd next dealt with the presentation of positive images in colour, and showed how the best tints to employ for the work which he was about to describe were yellow, blue, and magenta, and he demonstrated, by means of three coloured discs, how these colours, when made to overlap, would produce a complementary tint to each. He then threw upon the screen three separate images, being the copy of a Japanese fan, the first consisting of the yellow portions, the second of the greenish-blue, and the third representing the red portions of the original. These three images were then thrown superposed, giving a representation of the original fan in all its proper tints.

Having thus shown what the method was capable of, the lecturer went into details of manufacture, prefacing his remarks with the statement that the Cadett spectrum plate was the best for the purpose, and that, now that Captain Abney had devised a means of making the coloured screens to actual measurement, they can be supplied at a reasonable price. Indeed, the pioneer work had been performed, and now it was possible for all to profit by it.

The negatives can be taken in an ordinary camera by placing the proper coloured screens in succession in front of the lens, and giving, say, ten secon for the blue, twelve for the green, and fifteen for the red; but the employment of separate dark slides was a nuisance, and in practice it was better to use one long plate for the three exposures, each



third of which was covered by its own colour filter. A convenient form of camera which Mr. Shepherd had employed was shown, in which the pressure of a pneumatic ball three several times, checking each exposure by a watch, did the necessary work. This form of camera has, however, been superseded by something better.

The ideal form of instrument is one in which the three exposures can be made simultaneously, and many ways have been proposed whereby this desideratum may be brought about. One of the first was devised by Du Hauron, a very early worker in the field of colour photography. Its principal feature was a pair of interior semi-transparent mirrors, which occupied the centre of the camera like an inverted A. By this means a direct image was cast through the mirrors to a plate at the back, while the front mirror reflected another image to a plate on the ceiling of the camera, a third image being reflected from the back mirror to a plate on the bottom of the camera. As it was almost impossible to regulate exactly the right amount of partial silvering in these mirrors, the camera did not find extensive employment. Mr. F. E. Ives modified it, but with scant success. Mr. Sanger Shepherd has since taken it in hand, and by placing in the diaphragm slot of the lens a circular screen, which is red in the centre, but allows other rays to pass through its margin, and by opening the iris diaphragm during exposure so as to permit all rays to pass in turn, he has made this form of camera into a practical instrument, and it will, in its improved form, be presently placed on the market.

Means will also be presently commercially available for the production of three-colour lantern slides in the issue of special plates, or, rather, celluloid films of extreme whiteness and transparency. These films will be sold ready-sensitized with a special bromide emulsion, and the purchaser will resensitize them in a half per cent. solution of bichromate of potash, just as he would a piece of carbon tissue. The development will consist of immersion in warm water, leaving nothing on the clear celluloid but a transparent image in relief.

The three prints from the negatives having been made in this way, each one is treated with its proper dye, and it then only remains to bind the three together in proper register to form the coloured lantern slide.

Mr. Sanger Shepherd entered into all the details of the method, which we have only been able to treat in a general manner. It is quite evident that the process is an attractive one and capable of very fine results; it is, too, far more simple than any other which aims at accomplishing similar effects.

The paper received much attention, and the discussion which followed its reading resolved itself into a series of questions, which Mr. Sanger Shepherd was good enough to answer with much detail. A vote of thanks to him terminated the proceedings.

#### MR. E. R. ASHTON AT THE CAMERA CLUB.

THE latest one-man show at the Camera Club, Charing Cross-road, W.C., is the work of Mr. E. R. Ashton, whose collection of forty Egyptian and other Eastern photographs makes one of the most attractive displays that we have for some years seen at the Club. It may be said that for a considerable time past Mr. Ashton has passed his winters in kindlier climates than our own, and this has given him the opportunity of showing by photography, views of Oriental life, customs, and scenery, possessing those elements of charm and mysticism which attract many who, like ourselves, have not looked upon these scenes, as it were, first hand. Photographically, Mr. Ashton has pursued one idea unflinchingly, and, like all men endowed with this rare quality of continuity of purpose, has succeeded to the highest extent in what he has attempted, that is, to show, by means of the camera, how life is lived in the land of the Pharaohs.

Besides this feature of Mr. Ashton's collection, one other is apparent, namely, the consistently high quality of the work throughout. Mr. Ashton, it will be seen, is not the producer of a good photograph here and there, diluted with a great amount of mediocre productions, as is too often the case in these one-man exhibitions, but gives us a singularly level, as well as a good, selection. We are conscious that, in each of the photographs which he shows, Mr. Ashton has used the capabilities of his lens, plate, and printing process to the best advantage.

Scarcely any phase of Cairene life appears to have escaped Mr. Ashton's attention, and we have heard Oriental travellers say that he is to be congratulated on having been enabled to penetrate with his camera buildings into which Mohammedans have strong objections against the admission of unbelievers. The bazaars, the schools, the mosques, the pyramids, the Nile, characteristic bits of architecture, figure studies, land and water-scapes are treated. In his figures Mr. Ashton seems to us very successful; one feels, indeed, that they are natural, while the sentiment of the subjects appears to be distinctly suggested. As the printing processes are not mentioned, we must content ourselves by saying that generally Mr. Ashton leans towards warmth of tone. It is a decidedly interesting exhibition of pure photography that Mr. Ashton has got together; indeed, in the Camera Club just now, one seems to find oneself being transported in imagination to the banks of old Nile with all the historical glories which cluster round the very mention of the word Egypt. Photography of this sort deserves encouragement, and we hope Mr. Ashton will give us more Eastern work.

#### DINNER TO DR. P. H. EMERSON.

ON Thursday evening, October 5, Dr. P. H. Emerson was entertained to a complimentary dinner by a few friends, on the occasion of his visit to London during the present month. The scene of the festivity was the Restaurant Frascati, Oxford-street, and the chair was occupied by Mr. Thomas R. Dallmeyer, F.R.A.S., Vice-President of the Royal Photographic Society. In addition to the guest of the evening there were also present Mr. Thomas Bedding (vice-chairman), Mr. James A. Sinclair, Mr. H. Vivian Hyde, Mr. Fred. Marriott, Mr. Philip Everitt, Mr. E. J. Wall, Mr. H. Snowden Ward, Mr. Percy Wood, &c.

The health of Dr. Emerson was toasted in graceful and appropriate language by Mr. Dallmeyer, who briefly traced the guest's career in photography, and the very great services he had rendered to it. The year 1885 witnessed Dr. Emerson's abandonment of the profession of medicine, in which a successful career undoubtedly awaited him, for the purpose of studying the pictorial possibilities of photography. This work was undertaken in Norfolk and Suffolk, and, as they knew, resulted in many utterances, illustrated by photographs, which carried out Dr. Emerson's teachings. Those teachings were to be found in his book, *Naturalistic Photography*, published in 1889, which revolutionised ideas till then prevalent on the subject of picture-making by photography. In later years Dr. Emerson's work had been singled out for the very great honour of the Progress Medal of the Royal Photographic Society, of whose Exhibition he had also acted as Judge. After other remarks, in the course of which the Chairman assured the guest of the evening of the very high esteem in which his name and work were held in the photographic world, Dr. Emerson's health was drunk with full musical honours.

In reply, Dr. Emerson thanked those present for their kind reception. It was some years since he had been in London, and he had taken the opportunity of visiting the two photographic exhibitions now open. He was very much disappointed with what he had seen. He could detect no advance at either exhibition, save in the framing. The R.P.S. show was certainly the better of the two. With regard to the Salon, in his opinion Demachy's work was simply imitation of that of French painters, and his fan and similar subjects were copied from the bon-bon boxes. There was no sincerity in Mr. Horsley Hinton's work, which was frequently a travesty of nature and vulgar. Dr. Emerson strongly deprecated the imitation of painters' work by means of photography. The latter, he pointed out, had a power of rendering delicacy of gradation not possessed by painters, and, if photographers only availed themselves of that power, photography would certainly hold its own.

After other toasts, a pleasant evening was brought to a close in the usual loyal manner.

## Our Editorial Table.

#### THE "MACKENZIE" DAYLIGHT SLIDE AND ENVELOPES.

Manufactured by Mackenzie & Co., 15-17, Douglas-street, Glasgow.

We have had an opportunity of practically testing this new system of daylight changing, and found it exceedingly convenient and reliable in practice. Let us quote the manufacturers' description of their system of using enveloped dry plates in daylight changing:—

"The envelope is composed of stiff, light-proof cloth, and is made in two parts, an inner and an outer one. The plate is inserted between the grooves of the inner part and covered with a flap, and, at the uncovered end of the plate, is inserted into the open end of the outer part.

"The slide is made of book form, one side being fitted with the usual sliding shutter. The envelope containing the plate is laid within the slide on the shutter, which has a groove near its end to engage with a bar on the covering flap of the envelope. The other side of the slide is fitted with a spring to keep the plate in position, and has an opening covered with celluloid, by which any number or mark on the envelope may be read; it also shows if the envelope flap works properly when the shutter is drawn and closed.

"When the slide is placed in the camera and the shutter drawn, its groove, engaging with the bar on the envelope flap, draws it and the flap off the plate and rolls it up within the slide, and on the closing of the shutter recovers the plate. The envelope and its plate can then be taken out of the slide and placed in the pocket." We are bound to say that we are extremely pleased with this system of using opaque envelopes for daylight changing, and can recommend it to those who are seeking a simple means of film or plate-changing with dark slides.

#### SPECIMENS OF PHOTO-CERAMICS.

By Edward Lee, 10, Midland-road, Leeds.

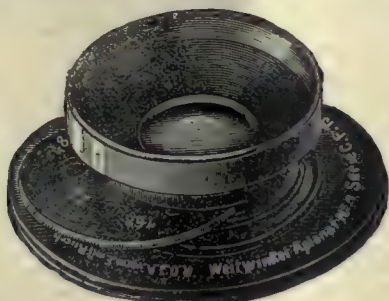
THE specimens of burnt-in photographs on earthenware slabs which Mr. Lee has submitted to us are exceedingly cheap, and should appeal to photographers desirous of introducing this form of reproduction to their clients. Mr. Lee adopts a modification of the dustin-gon process, and produces his results, either plain or tinted, on china, earthenware, opal, or glass, with glazed or matt surfaces. Besides being cheap—as an example, six cabinet "photo-ceramics" are supplied for 12s. 6d.—the results are attractive to the eye and should command considerable vogue.



## THE RATHENOWER LENSES.

Wholesale Agent: HENRY F. PURSER, 33, Hatton-garden, E.C.

Mr. PURSER has been good enough to lay before us specimens of the most recent lens productions of the Rathenower Optische Industrie lenses, for which he is agent. These comprise a wide-angle; a casket or universal set, and a projection lens for cinematography. An examination of these instruments shows them to have a very high degree of optical finish, and to be admirably adapted for their respective purposes.



The wide-angle series works at  $f/15$  and the angle included ranges from  $100^\circ$  to  $105^\circ$ . As an illustration of the capabilities of the series, we may say that the No. 3, with a focal length of  $7\frac{1}{2}$  inches, covers a  $9 \times 7$  plate with a medium stop, and with the smallest a  $12 \times 10$  the circle having a diameter of 20 inches. The performances of the cinematograph projection lenses may be understood from the following details. The No. 2 has a diameter of  $1\frac{1}{2}$  inches, an equivalent focus of 2 inches, and at distances of 6, 12, and 18 feet enlarges 38, 76, and 114 times respectively. For cinematograph purposes the series should be very useful; like the wide angles, the lenses are exceedingly cheap and are well finished.

Amateur and professional photographers alike will find great utility in the Universal sets. These sets are of the Periscopic Spectacle Lens type.



Series I. consists of four lenses, and Series II. of seven, with varying foci from 6 inches to 30 inches, which makes possible, in the case of Series I., 14 combinations, and in Series II. 29 combinations.

This very great variety of focal range and combination easily provides the photographer with a complete set of lenses for practical work on both near and distant objects. The sets cost 2l. 19s. 6d and 3l. 10s respectively, and are provided with yellow glass diaphragms. No better value could be desired for pictorial purposes. We are very pleased indeed with the excellent properties of the Rathenower lenses.

## THE "KRISTAL" PLATES.

B. J. Edwards &amp; Co., The Grove, Hackney, N.E.

The Kristal plates have been introduced for lantern slides, stereoscopic slides, and transparencies by contact printing. They admit of exposure to weak daylight or bright artificial light, and development by weak actinic illumination, such as gas or candle-light, and thus give the lantern-slide or transparency maker increased convenience in the practice of this beautiful branch of work by relieving him of a certain amount of dark-room imprisonment. We append the principal instructions for the manipulation of the Kristal plates, which, like all the productions of Messrs. Edwards, are sure to be popular:—

The plates may be exposed, under a negative in an ordinary printing

frame, either to subdued daylight or bright artificial light, such as a good paraffin lamp or gas-burner. The time of exposure will vary according to the colour desired in the finished transparency. For black tones a shorter exposure is required than for warm tones, about one and a half to two minutes at a distance of four inches from the flame of a good gas-burner will usually be found sufficient for black tones. Thus with a negative of ordinary density one inch of ribbon burnt at a distance of sixteen inches from the printing frame will give a good black tone. With a thin or weak negative the distance should be increased, or a dense negative may be printed at less distance from the light. For warm or sepia tones use four inches of magnesium ribbon at the same distances. The plates may be safely developed and handled by ordinary candle-light or in a room lighted by gas, no dark room being necessary. Care should, however, be taken not to bring the plates too near to the light, and to avoid, as far as possible, the light falling directly on to them. A sheet of white paper laid upon the table will reflect sufficient light to judge when the development is complete.

The plates must not on any account be exposed to daylight either before or during development.

## DEVELOPER FOR BLACK TONES.

Hydroquinone .....	120 grains.
Sulphite of soda .....	2 ounces.
Carbonate of potash .....	4 "
Bromide of potassium .....	40 grains.
Water to make .....	20 ounces.

For use, mix one part of the above with one part water, and pour directly over the exposed plate. Development should be completed, if the exposure has been correct, in about two minutes.

## DEVELOPER FOR WARM OR SEPIA TONES.

Eikonogen .....	45 grains.
Hydroquinone .....	15 "
Sulphite of soda .....	240 "
Carbonate of potash .....	120 "
Bromide of potassium .....	20 "
Citric acid .....	30 "
Water to make .....	20 ounces.

For use, take one part of the above and one part water. With this developer and sufficient exposure development should be finished in four to five minutes. Should this time be exceeded, owing to under-exposure of the plate, the colour will be darker and not so good. To obtain a rich, warm colour, a full exposure is necessary. Very warm or red tones may be obtained by still further increasing the exposure and diluting the developer.

As soon as development is finished and the details of the picture are visible, the plate must be plunged at once into the

## FIXING BATH.

Hyposulphite of soda .....	4 ounces.
Metabisulphite of soda .....	$\frac{1}{2}$ ounce.
Water to make .....	20 ounces.

After three or four minutes' immersion in this fixing bath, the transparency will be perfectly fixed and cleared. It must then be rinsed, and the surface carefully wiped with a tuft of wet cotton-wool, and then washed in running water for at least half an hour, or for the same time in repeated changes of water; seven or eight changes at intervals will be sufficient. The transparency is then ready to be dried in a cool place free from dust.

## "HYDROQUINONE BR."

A. &amp; M. Zimmermann, 9 &amp; 10 St. Mary-at-Hill, E.C.

UNDER the name of "Hydrokinone BR" another new developer has recently been placed upon the market, and a sample has been submitted to us for trial. It appears to be a bromine derivative of hydroquinone, and it is claimed, apparently not without good grounds, to possess the good qualities of hydroquinone without its characteristic defects. We used the formula given in the directions for use:—

## Solution A.

Hydroquinone BR .....	$\frac{1}{2}$ ounce.
Soda sulphite .....	4 ounces.
Water .....	25 "

## Solution B.

Potassium carbonate .....	3 ounces.
Water .....	25 "

Solution A 5 parts, solution B 5 parts, water 4 parts.

Our trials were made with some rather stale plates of a very popular extra rapid brand and some orthochromatic plates. The results obtained speak highly for the future popularity of the developer. The process of development proceeded steadily, we might almost say deliberately, and the operator can thus decide with certainty when to stop development. The negatives were characterised by a full scale of gradation and free



from the harshness of contrast associated with ordinary hydroquinone development. Both kinds of plates gave negatives free from fog and stain, although we had purposely selected the rapid series for their staleness. We also used the developer for some gas-light development paper, and obtained some excellent prints.

The developer was used for several plates in succession and we did not find much loss of energy. Left standing in a measure for forty-eight hours in the dark room, it had only acquired a pale straw colour.

A developer with the good qualities this seems to possess should soon become a favourite with photographers.

#### PHOTOGRAPHY IN A NUTSHELL.

By THE "KERNEL." 155 pages. Illustrated. Price 1s.

London: Iliffe, Sons, & Sturmer, Limited, 3, St. Bride-street, E.C.

In sending us for review a copy of the new issue of *Photography in a Nutshell*, Mr. W. Tylar points out that the book has been greatly rewritten and brought up to date. This 5000 issue now makes 33,000 copies of the work printed, and, out of the present issue of 5000, nearly 2500 have been sold before delivery from the printers. Mr. Tylar adds that he has recently had an application from a firm in India to reproduce some of the book in the Indian language. Excellence of get-up, variety of illustration, and, above all, a wealth of well-selected information about the practice of photography, should make the latest edition of *Photography in a Nutshell* popular. "The Kernel" (General Hawkes) and all concerned may be congratulated on the continuous success of the book.

#### CHRISTMAS MOUNTS FOR 1899.

Marion & Co., Soho-square, W.C.

We have only to say that the list of Messrs. Marion's mounts for 1899 extends to eight closely printed pages to give our readers an idea of the extraordinary variety of shape, size, and design which is at their disposal. Some samples of these mounts from midget to cabinet size, which we look forward to making practical use of at the festive season, have been kindly sent us by Messrs. Marion, and we can only say of them that they are exceedingly refined in design, tint, and shape, and should do much to enhance the popularity of the photograph as a Christmas card. On the latter subject Messrs. Marion truly remark that it is becoming so customary to mount photographs on cards, for the purpose of sending to friends at Christmas, that the ordinary form of Christmas card is being rapidly superseded. So wide-spread now is the practice of photography that such a revolution is of very great and general interest. Our professional readers should profit by this hint and push the Christmas card business amongst their clients.

In sending us samples of his new Christmas card mounts, Mr. Wilfrid Emery of 8, Dyne-road, Brondesbury, N.W., asks us to state that he prints from customers' negatives, and undertakes the work completely or supplies the cards only as may be desired. The cards are of tasteful design.

#### CATALOGUE RECEIVED.

Thorn & Hoddle, 1, Tothill-street, Westminster.

This catalogue is devoted to a description of apparatus for acetylene lighting and should be in the possession of those photographers contemplating taking up this form of illumination. There are special installations designed for studio work, and the application of the light for lantern purposes has not been lost sight of. Acetylene is probably only in its infancy as yet, and Messrs. Thorn & Hoddle are to be congratulated on their efforts to bring the undoubted qualities of the light before photographers.

## News and Notes.

A CAMERA Club has been formed in connexion with the Camborne School of Mines, the object being to devote attention to photography as applied to mining, surveying, &c. The officers elected are:—*President*: W. Thomas, C.E., F.G.S.—*Vice-President*: A. B. Beringer.—*Hon. Secretary*: H. W. Halifax.

On Wednesday, October 4, Mr. Thomas Fall, F.R.P.S., delivered a lecture on "Photographic Experiences" before a large and appreciative audience of the Borough Polytechnic Photographic Society. Mr. Fall's partiality for animals, especially dogs, was amply demonstrated by a fine collection of slides, whilst his descriptive anecdotes, given in a characteristic, confidential, and "chaty" style, were highly entertaining and amusing.

THE POLYTECHNIC.—This (Friday) evening is the opening night of the Photographic and Process Trades Classes at the Polytechnic, 307-11, Regent-street, W., Mr. Martin Cohn will take the chair, and will give an address on "The Present Position of Three-colour Work, and its Aspect in the Future." The syllabus and particulars of the winter classes in all branches of craft instruction in photography and process has been issued by the Polytechnic Institute, and may be obtained on application at the address given.

PHOTOGRAPHIC CLUB.—October 18, at eight o'clock. Nomination of officers for ensuing year. Paper by Mr. W. Thomas.

MESSRS. PENROSE & Co., 8 and 8A, Upper Baker-street, Lloyd-square, write: "We have pleasure in informing you that the whole of the first edition of the *Process Year Book* was sold out immediately on publication, and a large part of the second and final edition, which will be ready on October 16, is already bespoken."

At a meeting of the Plymouth Mercantile Association, one of the speakers (Mr. Luxton) complained of the manner in which local photographers, and those who produced view books, neglected to show the commercial and naval importance of the place. They might take their pictures of Plymouth Sound, for instance, when there were vessels in it, which would show how truly commercial the place was.

ROYAL PHOTOGRAPHIC SOCIETY.—Tuesday, October 17, at 5A, Pall Mall East, at eight p.m., Mr. Henry W. Bennett will read a paper upon "Architectural Photography." The following lantern fixtures are arranged for the Pall Mall Exhibition: Monday, October 16, "Travels in Italy, Spain, Algeria, &c." by Mr. H. Little; Wednesday, October 18, "A Holiday in North Wales," by Mr. J. A. Hodges; Saturday, October 21, "Bite by the Way," by Mr. E. Dockree, and "Byways of Italy," by Mr. J. C. Ashton.

THE South London Photographic Society will be favoured on Monday, October 16, by Mr. W. F. Fenton-Jones with a lecture entitled "A Swiss Trip." Any one interested will be welcome at the Hanover Hall, Rye-lane, Peckham, at eight o'clock. This Society has fixed the date of their Eleventh Annual Exhibition for March 3-10, 1900, both days inclusive, and have again secured the Camberwell Public Baths. Particulars and entry forms can be obtained of the Hon. Secretary, Mr. F. Goddard, Woodlands, Vanbrugh Hill, Blackheath.

THE CRIPPLEGATE INSTITUTE.—A photographic class for men only, conducted by Mr. C. W. Coe, will be held every Friday from date at the Cripple-gate Institute, Golden-lane, E.C. The course includes eleven practical lessons in development, printing, and toning, &c., specially arranged for amateurs. The fee is 10s. per course. 1, Introductory; 2, Apparatus and Lenses; 3, Plates and Exposures; 4, Lessons in Development; 5, Development; 6, Printing Processes; 7, Finishing and Toning P.O.P.; 8, Bromides and Platinotypes; 9, Enlarging; 10, Mounting and Finishing; 11, Defects and their Remedies. Tickets are now ready at the Clerk's office of the Institute at the address above given.

Re FRANK KNIGHT, photographer, Castle-street, Luton, Beds.—The above-named debtor came up for his public examination at the last sitting of the Luton Bankruptcy Court, before the Registrar. Replying to questions put by the Official Receiver, the debtor stated that he would not have been in his present position if his real property had realised the amount he expected. He commenced business as a photographer at Dunstable two years ago, and he had also been engaged as an agent for the sale of magic-lanterns. Subsequently he removed his business to Luton. Some three years ago he became responsible for a sum of 400l., but he eventually arranged with his solicitors to pay it off. He had never kept a proper set of books of account. Whilst in business in Dunstable, he speculated in real property, and that property was now on his hands. He gave 500l. for the property, and he had a mortgage on it for 400l. He had had some good seasons at the photographic business, but last year was "messed away." He first became aware of the fact that he was unable to pay his creditors 20s. in the £ when he was sued by a creditor for 30l. He owed Messrs. Marion & Co. 22l. 10s. for photographic materials purchased when he opened the Luton business. He would have paid them, but he was pressed by another creditor, so he paid him instead. If his Luton business had turned out as well as he anticipated, he would not have been in his present position. The debtor was eventually allowed to pass his examination.

## Patent News.

THE following applications for Patents were made between September 25 and September 30, 1899:—

DARK SLIDES.—No. 19,221. "An Improvement in Construction of Photographic Dark Slides." J. CORLETT.

STIPPLING PROCESS.—No. 19,363. "An Improved Process for Producing Stippled or Grained Photographic Pictures Directly from Photographic Negatives or Diapositives." R. WIDMANN.

STANDS.—No. 19,367. "An Improved Stand for Cameras, Geodetic Instruments, and the like." Complete specification. C. P. GÖRZ.

APPARATUS.—No. 19,396. "Improvements in Photographic Apparatus." J. E. THORNTON.

PLATE-HOLDER.—No. 19,472.—"Improved Photographic Plate-holder and Changing Apparatus." H. O. FOERSTERLING.

PLATE-CHANGING.—No. 19,473. "Improvements in and connected with Catching Apparatus for Exposed Photographic Plates." H. O. FOERSTERLING.

PHOTOGRAPHS.—No. 19,474. "Improvements in and connected with the Production of Photographs." Complete specification. H. O. FOERSTERLING.

PLATE-CHANGING.—No. 19,475. "Apparatus for Sliding Plates into the Exposing Chamber or Camera of Photographic Apparatus and Removing the Plates after Exposure." Complete specification. H. O. FOERSTERLING.

VIEW-FINDERS.—No. 19,593. "A New or Improved Optical Appliance for use in connexion with View-finders for Photographic or other Purposes." A. L. ADAMS, W. MALLETT, and C. W. BEEVOE.

SELF-TONING PAPER.—No. 19,633. "An Improved Self-acting Toning Paper." O. RATHEL.



## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
16.....	Birmingham Photo. Society	Excursion to London, to Visit the Exhibitions of the Royal Photographic Society and the Photographic Salon.
16.....	Bradford Photo. Society	What we See in an Old Church. S. Marguerison.
16.....	Camera Club	A Clumber's Holiday in Lofoten. Howard Priestman.
16.....	Kingston-on-Thames	Photography of Flowers. H. T. Malby, F.R.P.S.
16.....	South London	A Swiss Trip. W. Fenton-Jones.
17.....	Birmingham Photo. Society	Recent Advances in X-ray Photography. J. F. Hall-Edwards, L.R.C.P., F.R.P.S.
17.....	Gospel Oak	Exhibition of Prize Slides.
17.....	Hackney	Demonstration of New Wellington Film. Harry Wade.
17.....	Redhill and District	Platotype Printing. F. Marton Duncan.
17.....	Royal Photographic Society	Architectural Photography. Henry W. Bennett.
18.....	Orocydon Camera Club	Opening of Exhibition by Sir Frederick Eoridge, J.P.
18.....	Photographic Club	Paper by W. Thomas.—Nomination of Officers for year.
18.....	West Surrey	Official Visit to the R.P.S. Exhibition.
19.....	Camera Club	Clouds and Photographic Landscapes. James Cadett.
19.....	London and Provincial	Demonstration: The Wellington Film. Harry Wade.
20.....	Ashton-under-Lyne	Elementary Photography Class.
20.....	Orocydon Microscopical	Lantern-slide Making. J. A. Hodges.
21.....	South London	Excursion: Battersea Park. Leader, C. H. Oakden.

### ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 10,—Ordinary Meeting.—Sir H. Truman Wood, M.A. (Vice-President), in the chair.

#### ILLNESS OF THE PRESIDENT.

The HON. SECRETARY, having read a letter from the President, stating that he was slowly recovering from an illness which prevented his attendance at the meeting.

The CHAIRMAN said he was sure it would be the wish of every member of the Society that the Hon. Secretary should express to the Earl of Crawford their extreme regret at the cause of his absence, and their hope for his speedy restoration to complete health. The Society owed a great deal to Lord Crawford, who, notwithstanding the many interests which made calls upon his time, had devoted himself loyally and earnestly to its welfare, and whose excellent judgment and tact had been of the greatest advantage in many important respects.

#### BUSINESS OF THE SOCIETY.

Four new members were elected, and forty-five candidates were nominated, the Chairman remarking that no more convincing evidence could be afforded of the satisfactory position which the Society now occupied.

The HON. SECRETARY read a statement of recent presentations to the Society, which included a list of signatures in connexion with an attempt to secure a barony for Fox Talbot, on condition that he relinquished his patent rights (presented by D. J. Leyton, Esq.); and also Mr. T. H. Dallmeyer's Focometer, described to the Society some months ago, and now presented by him.

It was announced that the Polytechnic Photographic Society had been admitted to affiliation.

#### THE LATE PROFESSOR BURTON.

The CHAIRMAN gave sympathetic expression to the loss which the Society had sustained by the lamented death of Professor W. K. Burton, to whose sagacity and energy he paid eloquent tribute. The death of two other members of the Society, Messrs. H. C. Heinrich and Peter Thellusson, was also regretfully alluded to.

#### THE SOCIETY'S NEW HOME.

The HON. SECRETARY stated that the Society had received a very handsome donation of 100*l.*, in connexion with the Guarantee Fund for the new house in Russell-square, from the Maharaja Pradyot Coomar Tagore, an Indian prince in Calcutta, and an enthusiastic and clever photographer. The Council had decided to devote the amount to the purchase of the new book-cases required for the library, and had directed that a brass plate should be affixed to them, recording the fact that they were the gift of the Maharaja.

#### LANTERN EVENINGS—A NEW DEPARTURE.

The HON. SECRETARY also announced that it had been decided to hold an additional meeting on the first Tuesday in each month, when lantern lectures will be given, and at which lady visitors will be especially welcomed. The first lantern evening will be held on Tuesday, November 11, at the Exhibition Gallery, 5A Pall Mall, East, when Mr. J. J. Vezey will give a lecture on "Some Medieval Towns of Germany," with illustrations from photographs by Commander C. E. Gladstone, R.E.

#### PRESENTATION OF MEDALS.

The CHAIRMAN, in proceeding to present the medals awarded to exhibitors at the current Exhibition, remarked that the difficulty of awarding medals appeared to become greater year by year in consequence of the heightened standard of excellence. He thought that, if half a dozen fully qualified experts were each asked to make a list of awards, the six lists would be entirely different one from another, and that few pictures would receive more than two or three votes. Whether this opinion pointed to the advisability of abolishing medals altogether was a question for individual consideration, and he thought

the Council would do well to consider whether the time had not gone by for the recognition of merit by the award of medals. At the current exhibition the Society's medal was awarded to Mr. Dudley Hoyt (No. 21, *Head of an Old Man*), Mr. John H. Gash (No. 130, *Summer Shades*), Mr. W. T. Greatbatch (No. 139, *The Miller's Workshop*), Mr. C. F. Inston (No. 191, *After Rain*), Mr. W. R. Bland (No. 217, *In Wirksworth Church*), Mr. E. G. Boon (No. 273, *Sunny Pastures*), Mr. J. M. Whitehead (No. 276, *Roses*), Mr. A. Stieglitz (No. 299, a vignette in two colours), Mr. J. H. Player (No. 333, a copy of an etching by absorption process), Messrs. J. E. Johnson & Co. (No. 388, an engraved screen plate, 200 lines per inch), and Mr. E. Sanger Shepherd (No. 393, Trichromatic Light Filters). The Chairman presented a medal to Mr. Sanger Shepherd, who was the only exhibitor present who had received an award, and the Hon. Secretary was requested to forward the other medals by post.

#### THREE-COLOUR PHOTOGRAPHY.

Mr. SANGER SHEPHERD showed, by means of the lantern, a series of very beautiful slides in natural colours from three-colour negatives taken through the light filters exhibited by him, the slides being made by superimposing positives on very fine celluloid, the prints from negatives through the red screen being stained by a greenish-blue dye, those from the green negatives being stained pink or "minus green," and those from the blue negatives being stained yellow or "minus blue." Most of the slides were photographs of orchids and butterflies, and all were much admired for their delicacy and accuracy of colouring.

#### PRINTS ON GOLD AND SILVER.

The HON. SECRETARY showed a plate of silver on which a visible image had been obtained by exposure under a rectangle of black paper, from which it was separated by a mica screen in which his initials had been cut. The plate had received no treatment whatever, either before or after exposure: the image of the paper mask and the edges of the mica screen were visible on the plate, but gradual darkening of the whole surface was noticed. General Waterhouse also showed similar effects on gold leaf and silvered glass, the images in certain cases having been developed with mercury.

#### COMING EVENTS.

October 17, "Architectural Photography," by Mr. H. W. Bennett. October 24, "The Wellington Film," by Mr. H. Wade. November 7, Lantern Evening (See above). November 14, the Traill Taylor Memorial Lecture, "Teaching of the Daguerreotype," by Major General Waterhouse, I.S.C.

### PHOTOGRAPHIC CLUB.

OCTOBER 4,—Mr. F. A. Bridge in the chair.

Mr. HENRY W. BENNETT read a paper on

#### ARCHITECTURAL PHOTOGRAPHY.

Speaking to an assembly of competent photographers, Mr. Bennett said he would exclude from his lecture all those common or garden advices generally given to the same class of amateur, and confine himself principally to those matters on which differences of opinion might exist amongst experts. Mr. Bennett first dwelt on the special difficulties encountered by the architectural photographers. The Scylla of limited space on the one hand, and the Charybdis of a too wide-angle lens on the other, being the two principal dangers encountered, which very frequently lead to disaster. The judging of the length of exposure, too, is generally very difficult, and actinometers are of no value, whilst the so-called "intuitive" method of judging the exposure by the appearance of the picture on the ground glass must be altogether discarded. In fact, it is only by experience that one can hope to overcome this difficulty. The best atmospheric conditions will generally be those when light clouds are in the sky, especially when they are low down, as this illumination is best suited to reduce the harsh contrast frequently encountered in this kind of work. As already mentioned, the angle of the lens used is a most important feature, whilst it is generally impossible to work with long-focus lenses; wide-angle lenses frequently give monstrous results. Mr. Bennett found that a seven-and-a-half-inch lens on a whole-plate gave as a rule the best results. It is, however, necessary that the lens cover more than the plate, so as to allow the use of the rising front to its fullest extent. A flat field is, of course, very desirable, and Mr. Bennett is of opinion that the modern anastigmat is in this respect a great improvement on the older lenses. As to the position of the camera, it ought to be about five to six feet from the ground, as a higher elevation might very often be detrimental to the picture. Owing to the long exposures generally necessary, the absolute steadiness of the camera is of great importance, and, in order to secure this, Mr. Bennett recommended a tripod stay, one or two of which are on the market, although they are but seldom bought. In the absence of a proper tripod stay, a large rug will do good service. Mr. Bennett considers the backing of the plate essential. As to development, he invariably begins with what would be generally called a normal developer, and changes the same, as soon as the picture appears, according to requirements. He does not recommend (although this may appear safer at first sight) a diluted developer to begin with, as, in this case, it would be frequently very difficult to build up density afterwards. With regard to printing, very few negatives of this class can be printed without modifications of some sort. Mr. Bennett recommends covering the negative with tracing paper; to cut out the highest lights and the deepest shadows with a second layer of tracing paper. He protested against the word "faking" being applied to an operation of this sort, which is indispensable in order to get an harmonious picture. Touching upon the question of pictorial effect generally, Mr. Bennett was glad to notice that there was a growing tendency to consider this point more and more. Pictorial effect is, however, not inconsistent with sharpness throughout; and he protested strongly against that section of the photographic community which found salvation in "out-of-focus" effects. The suggestion of distance is just as important in a picture of this class as in landscape photography, and an otherwise satisfactory photograph might often be spoilt through its absence. There are photographs in the London exhibitions now which show this defect, and this is all the more



regrettable in those cases where it might easily have been avoided, as, for instance, in photographs of church entrances, where the effect could have been obtained by opening the door instead of keeping it shut. Another defect which one frequently meets with (even in photographs that have passed the selection committees of our principal exhibitions) is the want of completeness. To be a success, the picture must be continuous; the principal object must not take too much space, or be only partially shown. Mr. Bennett then further illustrated the chief points of his lecture by the help of several slides.

A hearty vote of thanks was passed to Mr. Bennett for his very interesting and thoroughly practical lecture.

**Croydon Camera Club.**—The regular weekly evening meetings were, as usual, inaugurated on the 4th inst., being the first Wednesday in October, when the PRESIDENT (Mr. Hector Maclean) briefly addressed the members upon various photographic events, and on the work of the Club. In the course of his remarks he strongly deprecated the illustration, by photographs, of certain subjects as shown at the Royal and the Salon Exhibitions, specially distasteful being some so-called sacred studies representing the Crucifixion and the Entombment, which were calculated to grossly offend the feelings of all who revere the Founder of Christianity. Subsequently Mr. Maclean gave a brief demonstration in order to illustrate the working of a new brand of lantern plate which has just been brought out. Although, after the successful introduction of Velox and similar slow bromide papers, lantern-slide making, without needing a yellow or orange light, is what might be well expected, this was the first occasion that such a plate had made a special claim to this convenient simplification of procedure. Mr. Maclean proceeded to expose and develop a lantern plate in the Club room with one of the electric lights full on all the time. The exposure was one inch of magnesium ribbon at sixteen inches from negative, which was a fairly dense but rather quick printing one. Hydroquinone was used, the slide being developed in about one minute. There was no sign of light fog. The lights came out quite clear. The Exhibition arrangements were brought before members, who were reminded that, to ensure entrance to the *Soirée* on the 24th, prompt application for tickets is necessary. Entries for the Exhibition are now pouring in from all parts. Amongst them are prints from a gentleman whose home is the Silver Palace, Constantinople, and whose office is private photographer to the Sultan. His pictures of Turkish life and scenery will, no doubt, attract considerable curiosity.

**West Surrey Photographic Society.**—The opening night of this Society's new season was last Wednesday evening, October 4, at the Railway Tavern, Battersea-rose, when Mr. H. Vivian Hyde gave a lantern show of quite exceptional merit, entitled "Lowestoft and Neighbourhood." The Harbour, with its boats and shipping, was finely illustrated, and thence to the Broads and Norwich gave occasion for any number of beautiful slides, much beyond the usual. Some brilliant cloud effects were combined with landscapes of value, and the many scenes were accompanied with comments by the lecturer, just topographical enough, so that the whole went with briskness, and to the huge satisfaction of the closely packed audience. A few slides were added of general interest. Some reductions of Mr. Hyde's well-known exhibits were, we think, among the slides shown. Altogether the evening was a great success, concluding with a well-deserved vote of thanks. Mr. W. H. Wilsheer was at the lantern.

**Cornish Camera Club.**—At the Annual Meeting of this Club at Penzance, on Monday evening, Mr. W. E. Baily, of Lynwood (the President of the Club) reviewed the advances in photography during the year, and suggested that members should investigate in the coming year the curious fact that, given the same materials and circumstances, one man could get good results, while another man got only unsatisfactory results. Mr. H. Tonkin (the Hon. Secretary) reported that last year twelve meetings were held, eleven provided for by the members, and the other by Mr. Baldwin, of the Paget Prize Plate Company, who gave a demonstration of Gravura paper. Some of the members had shown a great improvement in their work. The Treasurer reported a balance in hand of 9*l.* 16*s.* On the motion of the Mayor of Penzance (Mr. R. Pearce Couch), Mr. Baily was unanimously re-elected President, and, in acknowledging the heartiness of the vote, Mr. Baily said he hoped to be in a position to ask the members to join him in a short time in a demonstration concerning the Edison-Bell invention. If he could get the instrument, he wanted to bring it to Penzance, and he hoped that they would be able to inaugurate an autumn show. Mr. Couch mentioned that he had recently been engaged in photographing groups of the borough charter, dated 1614, the maces and things of that kind, which he thought might be interesting.

**Rotherham Photographic Society.**—October 3, Annual Meeting. Dr. Baldwin (President) occupied the chair.—The report and Treasurer's statement was considered very satisfactory. The balance in hand was 1*l.* 1*l.* 10*d.* The annual Exhibition had resulted in a loss of 1*l.* 3*s.* 3*d.* Officers were elected as under:—President: Dr. F. B. J. Baldwin.—Vice-Presidents: Messrs. E. Isle Hubbard, J. Leadbeater, and W. Rider.—Hon. Treasurer: Mr. A. S. Lyth.—Hon. Secretary: Mr. H. C. Hemmingway. The other members of the Council chosen were:—Messrs. C. E. Parkin (Hon. Assistant Secretary), F. Oldham (Librarian), J. Caseldine (Auditor), W. Firth, and J. C. Cox.

**Edinburgh Photographic Society.**—On Wednesday evening, October 4, the First General Meeting of the Society was held for session 1899-1900, Mr. A. Eddington, F.I.I. (the President) in the chair.—In the course of his opening address the PRESIDENT said: "What I would like to bring particularly before you to-night is a proposal that the Society as a body should undertake a definite work of permanent value. Last year I hinted at something in the direction that I shall now put before you in more definite form, supported by the approval of your Council. There must be many among us who have in their possession characteristic photographs of Edinburgh. Portions of the

city rich in historic association and of great architectural beauty have been swept away within the memory of many of us, and no record of the change has been preserved by any association or corporate body. The proposal that I have to lay before you is that this Society should form a permanent collection of prints and lantern slides illustrative of Edinburgh. In attempting this work we shall be doing something that is of real value to the Society, and that, in time to come, will form a most instructive pictorial record of the changes that take place in the face of one of the most picturesque and romantic cities of the British Empire—let me say, of the world. The subject would give great scope to the individuality of the worker. Pictorial arrangement, architectural design, historic interest, archaeological features would each call for reproduction. In addition, there is the ever-changing aspect of the City's life, and here the worker in figure subjects would find a wealth of good material. A proposal of this kind, to be properly worked out, would require some systematic effort, and I hope that a scheme of operation will shortly be laid before you; but, speaking generally, it would be desirable that each contributor should send a lantern slide and print of the same subject, and it will be essential that the latter should be in a permanent process, either carbon or platinotype. The prints would be received unmounted and properly classified in albums. It is most probable that, to carry out the idea, it may be necessary to form a section of the Society, the members of which would have portions of the city mapped out for them, which they would undertake to pictorially survey. I have been assured by several members to whom I have mentioned the matter that they would readily join the section and undertake the work, and might I ask for volunteers from this meeting? The Secretary will be pleased to receive their names. There is only one other matter which I would like to bring before you, and that relates to the coming Exhibition. The Council decided last night that there should be a small charge for exhibits in all sections instead of as hitherto only in open sections. The fee will only be one shilling for the two pictures, which members are entitled to send to each section, while the charge in the open sections has been reduced to members from one shilling to sixpence per square foot, non-members paying the same charge as hitherto. This, it is hoped, will spread the small financial burden incurred by the Exhibition more equally over the exhibitors, and press unduly on none. It will afford me much pleasure to again give a gold medal for the best picture by an amateur member of the Society, and the essay competition will be continued under the same conditions as last season. I hope the Exhibition, for which many of us are doubtless already working, will eclipse all previous records in variety of subject and excellence of work, and that in every respect the present season will be one of continuous progress to higher things." These remarks were heartily received, and the Chairman, on the motion of Mr. John Anderson, was accorded a hearty vote of thanks. In the course of the evening the medals and certificates gained at the last annual Exhibition were presented. The new medal, which was designed by Mr. Robert Hope, Edinburgh, was highly spoken of. Afterwards, a lecture on "The Optical Lantern as an Educative Medium," illustrated, by A. H. Baird, F.R.P.S., was delivered, a report of which will appear in due course.

#### FORTHCOMING EXHIBITIONS.

1899.

- October 13-Nov. 4 ... Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.
- " 13-Nov. 11... Royal Photographic Society. Hon. Secretary, Major-General Waterhouse, 66, Russell-square, W.C.
- " 18-24 ..... Croydon Camera Club. Hon. Secretary, W. H. Rogers, 106, Holmesdale-road, South Norwood.
- " 22-Nov. 19... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.
- November 15-17 ..... Hackney Photographic Society. W. Selfe, 70, Paragon-road, Hackney, N.E.
- " 20-25 ..... Longton and District Photographic Society. Thomas Mottershead, 43, Stafford-street, Longton, Staffordshire.
- " 27-Dec. 18 American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.
- December 7-9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.
- " 11-Jan. 1900 Huddersfield (Invitation). W. A. Beavers, Cloth Hall-street, Huddersfield.
- " 27-30 ..... Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.
- 1900.
- April 3-7 ..... Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.



## Correspondence.

- \* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.  
 \* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### THE R.P.S. EXHIBITION.

To the Editors.

GENTLEMEN,—Mr. Harold Baker, in his letter which you published on September 29, seems to be so angry with everybody that he does not think it necessary to explain to outsiders what it is all about. He appears to have a grievance against the R.P.S., which I assume they will deal with if they think it desirable to do so; but, on the general question of judging and selecting, which has been brought up by Mr. Baker and others, I should like to be allowed to say a few words. It seems to me that some people do not realise the difference between these two operations. If I understand the position rightly, it is this: the R.P.S., having announced that they are ready to receive exhibits, appoint a Committee of their number to select a sufficient number to form an exhibition. When the pictures are hung on the walls of the Gallery, the Judges, who have been chosen by the members, are invited to award medals for those exhibits which they consider deserving. The Judges' responsibility does not therefore extend beyond the pictures which are submitted to them, and why they should be angry because they are not called upon to go through the laborious task of examining every exhibit sent in I cannot imagine, and, indeed, I venture to think Mr. Baker is not speaking for the majority of the Judges, but is simply expressing his own views. If, on the other hand, his contention is that the Committee appointed by the Council are not competent to make a selection, or are likely to be influenced by unfair considerations, then, I should say, neither are they fit in that case to sit on the Council of the R.P.S., and yet the members showed their confidence in them by placing them there.

The whole question of medalling seems to me to call for reconsideration. I think it is very objectionable, and prevents much good work being sent in, because the authors of it do not wish to put in competition with others. I should like to see it banished altogether, for it seems to me to lower the tone of the Exhibition altogether.

Do you think artists in oil paintings would send their work to the Royal Academy or other large exhibitions if medals were given for the best work?

As a matter of fact, it is quite impossible to decide which is the best picture. Look at the medalling this year at the R.P.S., without reflecting in the least on the Judges' decisions, is it not easy to find many pictures unmedalled which are quite as good, if not better, than some of those which have received awards? I say, therefore, Abolish the system of medalling altogether, and with it will go most of the troubles which exhibitions invariably give rise to.

Mr. Baker seems to have no sufficient reason for resigning the membership of the Society; if there is anything wrong in the system of the Exhibitions, it surely would be better for him to stay and help to improve it. I hope his vexation does not arise from any other cause. I notice there are some of his pictures in the Exhibition; is it possible that he sent some which have not been hung? I suppose only the Seating Committee could answer this question.—I am, yours, &c.,

October 4, 1899.

NEMO.

### TONING BROMIDE PRINTS.

To the Editors.

GENTLEMEN,—Having from time to time noticed some of your readers ask you for a method of toning bromide prints, thinking it might help them to gain their desired end, enclosed is a process which will give all that they may desire. I have tried myself the Velox process. It does not answer with me, and I believe it can only be done by toning after fixing (of course my knowledge is very limited). Trusting you will think it worth telling to others.—I am, yours, &c.,

T. KING.

High-street, East Malling, Maidstone, October 9, 1899.

The tone or colour of the deposit depends on the accuracy of exposure and the developer employed. Every one has their own way of working, various though they are. Bromide paper is one of the most permanent of all the silver papers. To gain that end, thorough fixing must be studied. I always fix in a four ounce in twenty of water for fifteen minutes, washed for a few minutes, and followed by a three ounce in twenty of water for another ten minutes. The toning methods for bromide prints are not very many. Brownish-black prints are much improved by toning in a bath composed of—

#### No. 1.

Sulphocyanide of ammonium .....	20 grains.
Water .....	1 ounce.

#### No. 2.

Chloride of gold .....	2 grains.
Water .....	1 ounce.

Add No. 2 to No. 1, slowly moving the solution all the time, flow over the fixed, washed, prints till the right density is reached. Prolonged toning will give a deep blue tint. Prints must be kept moving all the time. Brown, reddish-brown, and red tones are got by using the following bath:—

#### No. 1.

Ferricyanide of potassium .....	20 grains.
Water .....	20 ounces.
Glacial acetic acid .....	1 ounce.

#### No. 2.

Uranium nitrate .....	20 grains.
Water .....	1 ounce.

When No. 1 is dissolved, add No. 2. This bath must be used at once. It will not keep mixed together. Immerse prints, and keep moving all the time till the desired colour is produced. After toning, wash prints for an hour in several changes of water, acidulated with acetic acid one drachm in thirty ounces of water. If, after half an hour's washing, the whites are at all thick or yellow, immerse in the following bath till cleared:—

Sulphocyanide of ammonium .....	20 grains.
Water .....	10 ounces.

After clearing, continue washing for half an hour in clear water. Prints toned by this process must be thoroughly washed free from all hypo.

### THE RIGHT TO THE NEGATIVE.

To the Editors.

GENTLEMEN,—I should be glad if you would kindly give me a little information on the following matter:—

I photographed some bottles and labels for a firm of spirit merchants, charging them 2s. each for the first print, and 7s. per dozen for further copies, cabinet size.

Shortly after the account was sent in, they demanded the negatives, which I declined to give up, as no agreement was made to that effect, and no mention made of negatives at the time I gave the quotation; they thereupon refused to pay my account, so I have entered the matter in the County Court, and should now like to know of some previous law cases in which it has been decided that the negative is the property of the photographer in the absence of any specific agreement to the contrary.

I have been a regular subscriber to your JOURNAL for many years and have most of the copies by me, but not arranged in such order that I could refer to them very readily. As the case comes on for hearing on the 17th inst., I should esteem it a great favour if you would give me particulars of cases, either in your next issue.—I am, yours, &c.,

A. H. PUGH.

[This matter has been decided many times, and always in favour of the photographer—the negatives are his property. See page 114 of our volume for 1895, also page 194 for 1896. If we had received the letter earlier than we did, we should have looked up other cases. But really there is no question at all in the matter.—Eds.]

### ACETYLENE.

To the Editors.

GENTLEMEN,—Your article upon acetylene in last issue is, we are sure unintentionally, calculated to do harm to this new industry, and we crave your favour to supplement it by further information. The fire insurance offices do not "continue to throw in the way of would-be users difficulties of a harassing and obstructive character." On the other hand, many of the offices have taken great trouble to make themselves acquainted with the characteristics of and conditions surrounding carbide and acetylene; and, speaking generally, their regulations are only such as to protect themselves from careless or ignorant persons. One office has gone so far as to issue a notice that they do not charge an increased premium when acetylene is used.

The remark that impurities are liable to produce explosive compounds when in contact with metal, or to initiate spontaneous combustion, is a relic of the early days when the gas was not properly understood. Such ideas have long been swept away by practical experience.

Mention is made of several foreigners who have experimented with methods of purification, but, as Englishmen, we cannot help remarking that in 1897 we patented a purifier with a special mixture, which has been extensively used ever since, and has never failed to satisfactorily remove the unpleasant smoky fumes which render the use of the gas in closed rooms unbearable without purification.

The grave source of danger said to result from the after-formation of gas in the generators, when the carbide has been removed, is only present in machines of unscientific construction, or self-contained generator lamps, such as are used for bicycles, &c.—We are, yours, &c.,

Westminster, S.W.

THORN & HODDLE.



## THE ECLIPSE PHOTOGRAPH AT THE R.P.S. EXHIBITION.

To the Editors.

GENTLEMEN,—In the Exhibition of the Royal Photographic Society there is a picture, No. 357, which purports to represent an eclipse of the sun as seen at Quetta, on January 28, 1898. It is a very fine picture of clouds, but I am at a loss to understand how it can have been put forward as being like an eclipse of the sun.

High in the sky there appears a bright disc partly hiding a dark one, and surrounded by a bright halo. Now we all know that a solar eclipse is caused by the moon passing between us and the sun; inasmuch as the moon shines by the light it receives from the sun and reflects to us, it is manifest that on these occasions the disc of the moon must be dark, and that the appearance must be of a dark substance, with a convex dark edge obscuring part of the solar disc. This appearance is precisely reversed; it is as though the bright sun were passing in front of the dark surface of the moon. How the photograph was made I do not attempt to say, but I am quite certain it does not represent any phase of a solar eclipse, either at Quetta or elsewhere.—I am, yours, &c.,

J. F. TENNANT, Lieut.-General, R.E.

11, Clifton Gardens, Maida Hill, W., October 7, 1899.

[We have carefully examined the exhibit referred to by General Tennant, and can confirm the accuracy of his description.—Eds.]

## CLAMBAKE.

To the Editors.

GENTLEMEN,—Re your request (September 8), herewith you will find full and complete instructions to prepare a clambake, illustrated by a diagram, so that you can prepare one in England—if (?) you have the necessary articles.

I will make you an offer that, if you will come to New York City at any time in the spring or summer season, I will demonstrate to your inner man how good a clambake is. Please bear this in mind.—I am, yours, &c.,

C. H. CROSSBY.

87 and 89, Washington-street, Chicago, Ill., September 21, 1899.

[We are very much obliged to our friend for the clambake recipe which is given with an amplitude of detail and wealth of illustration that would do credit to a cookery book. Possibly a clambake may one day figure in the programme of a British Convention, and we will treasure the recipe against the appearance of such a contingency.—Eds.]

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

G. H. SHORT (Capetown).—The suggested article shall appear shortly.

RECEIVED.—T. RECKFORD; H. HALL; BUSINESS. These and others in our next.

ARTIGNE PAPER.—ARTISTIC inquires where the Artigne paper, with directions for use, is to be obtained in this country, and its price.—We believe it is sold by Messrs. Adams & Co., Charing Cross-road; also by Messrs. Gaumont & Co., 25, Cecil-court, Charing Cross-road.

Z. W. S. writes: "With reference to inquiry in your last issue by 'J. R. R.' for Braun's lantern slides, I may mention that I obtained a number of the slides in question through Messrs. W. Watson & Sons, 313, High Holborn, and I believe they have still some stock of same."

INQUIRER (Norwich).—An approximate estimate, derived from our experiences of artificial-light photography, would be from 4000 to 6000 c. p.; but no reliable data on the subject are available, much, of course, depending upon the rapidity of plate, whether the subject be light or dark, and so on. However, the power required would be thousands.

AUTUMN PICTURES.—R. BAIN writes: "Referring to the pictures by the late Mr. Vernon Heath, alluded to a few weeks ago, taken in the autumn, and many of which I am familiar with, can you tell me if he used orthochromatic plates and a colour screen?"—No, he did not. Most of the late Mr. Heath's pictures were taken by the wet collodion process.

BOOKS ON PHOTOGRAPHY.—GUILD says: "I have been asked to give a short paper on 'Photography' at an improvement class, or young people's guild, in connexion with our church. It would not have to be technical at all, so I thought of giving a short history of the discovery and progress of photography, its development, briefly describing the different improvements, &c. Will you tell me the best book or books for my purpose? I want my paper to be interesting and entertaining as well as instructive."—In reply: You will obtain sufficient of the history and development of the subject from Jerome Harrison's *History of Photography* and Werge's *Evolution of Photography*. Any dealer will procure the books for you.

MOUNTING GELATINE PRINTS.—F. E. G. says: "Will you kindly advise me? I want to mount gelatine prints, upon ground glass or opal, to get matt surface, and afterwards to dry mount them to preserve the matt. Can you tell me how this is best done, and what mountant to use? Has it been previously described in the JOURNAL; if so, what date? I have a roller mounting machine."—Thoroughly clean the ground glass, then rub it over with French chalk. Squeegee the prints on that, and, when dry, strip off and mount with stiff starch paste. Or a piece of paper may, while the print is on the glass and still wet, be cemented on its back, but that is scarcely necessary to preserve the matt surface.

CHARGES FOR UNMOUNTED PRINTS.—BILTON says: "I am in the photographic view business (local views of my own taking), and should like to know what you would consider I should charge for 6 x 4 unmounted prints where the purchaser wishes to reproduce the views in a publication dealing with the scenery of the district. (1) In case my name is given at foot of reproduction. (2) When it is not so given. I retail the views at 8d. each, but think a different charge ought to be made when required for purposes of illustration!"—1. The minimum charge by the members of the Copyright Union is 10s. 6d. a subject for one edition. 2. That is quite a matter of arrangement between the owner of the copyright and the publisher.

NEGATIVE REFUSING TO FIX.—AJAX says: "I send a negative, which quite refuses to 'fix.' Another negative developed with the same developer, and placed in the same dish of hypo, fixed perfectly in the usual time. I have never known such a thing occur before. Can you tell me the probable cause of it? What the dark stains at the back of the negative are caused by, I do not know. The development was somewhat prolonged. I have tried to fix with cyanide of potassium, but it has no effect!"—This query, with a sight of the negative, caused us some little surprise, inasmuch as the negative is perfectly fixed. Not so, however, the unexposed plate firmly adherent to its back, the film of which the fixing solution could not get at. Indeed, the negative was a very good one till broken by our penknife in separating the two plates. The stains were, on the second plate, caused by the developer getting between the plates.

MOUNTING STEREO PRINTS.—W. WALKER says: "Will you kindly tell me the best way to print stereo pictures on one piece of paper without the trouble of transposing, the same as those you buy commercially? I have tried cutting the negative in half, but find a difficulty in holding the same while printing. Could the negative (the two halves) be cemented on to a plain piece of glass? If so, what would be the best cement to use?"—Put the two halves of the negative together on another and slightly larger plate of glass, and secure them by the edges with strips of gum paper. There is another way, however, without cutting the negative. Take a piece of sensitive paper double the length of the negative, then fold one-fourth of it at each end backwards; this will give a length of the negative, but with double paper. Print on one side and then the other, and cut in half; this will give two prints the right way about.

ENAMELLING PHOTOGRAPHS.—W. S. GRAY writes: "Would you kindly inform me the process of enamelling silver prints as it is done by trade enamellers? I imagine they use collodion; if so, that would be an expensive item, and considerable skill required to obtain an even coating in the case of large prints. Do you think it worth while doing one's own enamelling, or would it be better to continue sending it to a professional trade enameller?"—The method of enamelling prints with collodion has been described in detail over and over again in the JOURNAL and in the ALMANAC. Briefly, it is this: A cleaned glass plate is treated with wax or French chalk, then coated with collodion. The plate, after the solvents are washed away, is immersed, together with the print, in a solution of gelatine, and the two squeegeed in contact. There is no great skill required, after a little practice, in coating the plates with the collodion up to, say, 24 x 18 or larger. As to the question of doing the work at home, or putting it out to be done, this depends upon the quantity to be done, and whether it is worth our correspondent's while to learn to do it for himself.

THREE-COLOUR PRINTING.—TRICOLOUR says: "A customer of mine requires a large number of three-colour prints. I shall be obliged, therefore, if you will answer the following queries, or, if too long for that, by saying what is the best I can do in the matter. My understanding of the matter is to the effect that I must secure three negatives taken with three different screens, so as to have one for each of the primary colours. The next stage I understand to be three process blocks, one each, as before, to be printed from in the usual way, so as to superimpose the relative colours, and thereby give the desired effect as representing in natural colours the object photographed. Please say in reply if the foregoing is correct, and, if not, point out error; also whether or not the work of printing can be as successfully done by lithography. If you can put me on the right track to either do the work myself, or, when the negatives are taken, to get the prints worked off, I shall be greatly helped. I have previously done the work by blocks and printer's aid, but only in two tints; now it must be three, and I realise the importance of your often-quoted advice that the professional photographer should get such work. I may add that, consistent with good work, the price must be as low as possible. As I have said, a reply that will set me going will be of service."—In reply: Our correspondent correctly outlines the three-colour half-tone process, but we cannot recommend him to undertake production of the blocks and the prints in colours unless he perceives a return for the considerable sum of money which the necessary installation would cost. Our advice is, having obtained the negatives, to get estimates for the colour-printing from such firms as Messrs. Waterlow, Finsbury; Messrs. Swain, Barnet; the Arthur Cox Company, Birmingham; and other firms who undertake the production of work in three colours.



# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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## THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1900.

Edited by THOMAS BEDDING, F.R.P.S.

THE thirty-ninth annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1 next. Its preparation is already receiving attention. This year's ALMANAC reached a total of 1508 pages, and the entire edition of 20,500 copies was sold out within about three months of publication. Of no other photographic book ever issued can two such unique facts be recorded.

The striking favour with which past ALMANACS have been received is the surest proof that the lines upon which that publication is produced meet the requirements of its readers and supporters. Upon such lines we propose compiling the volume for 1900. At the same time we shall be pleased to receive and consider suggestions for increasing the value of the ALMANAC in directions which may occur to our readers as susceptible of improvement.

The ALMANAC for 1900 will appeal to photographers all the

world over as a daily reference guide in practical work. The formulæ will be revised where necessary, and the latest departures in theory and practice will be chronicled. The year's advances will be recorded, and wherever practicable new features of an informative nature will be added.

Adhering to an old and much-appreciated custom, we invite short contributions on practical subjects for the pages of the 1900 ALMANAC. Those of our friends intending to co-operate with us in in this respect will oblige us by letting us have their MS., sketches, &c., at the earliest possible date.

Secretaries of societies will also oblige if they will forward us lists of officers and other details for inclusion in the directory of photographic societies. We shall also be glad to receive any additions that may be made to the list of telegraphic addresses of the trade, &c. As usual, a section of the ALMANAC will be devoted to notices of the latest introductions in photographic apparatus, &c. Those firms who wish to take advantage of this feature should communicate with us as early as possible.

The publishers ask us to remind advertisers that many of the advertisement pages of the ALMANAC are already booked, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

## EX CATHEDRÂ.

A FORTNIGHT ago we drew attention to the fact that our contemporary the *Stage* was supplying its readers with bromide enlargements of their portraits at cheap rates, and we congratulated that admirable paper on not following in the path of other newspapers that have worked this somewhat ancient scheme in saying that enlarged pictures which can be produced for a very few shillings each are charged for by photographers at the rate of four or five guineas. By the last number of our contemporary we perceive that we were somewhat premature in our congratulations, for the enlargements are said to "bear comparison with those for which four or five guineas are usually charged." We have examined some of these enlargements, and can only say that the photographer who obtained four or five guineas for them would be an exceedingly clever and fortunate man. Between these productions and those upon which an amount of hand work is bestowed which



justifies a charge of four or five guineas there is as much difference as there is between chalk and cheese. The *Stage* enlargements are not worth a penny more than what is charged for them, viz., 12s. 6d., and no inconsiderable harm is done to professional photographers by the suggestion that the latter obtain four or five guineas for such productions. Our contemporary so well and jealously guards the interests of its own great *clientèle* that we must suppose it is by pure inadvertence it is harming professional photography in the way we have indicated.

\* \* \*

THE professional photographers of the United States of America are being strongly urged to unite for purposes of mutual help and interest. At the recent National Convention a committee of professional men was appointed to draw up an address to their brethren, and the extracts we here give from that document will show the objects held in view by those who are advocating union and combination. The Committee say that, "in view of the fact that the spirit of the age is organization, and that almost every industrial institution in the United States is forming itself into an adhesive organization with a common centre, with power to wield the body as a whole for defensive purposes, the time is ripe for photography (a business which to-day is indispensable) to follow suit. When you come to consider it in detail, you are confronted with conditions probably not to be found in any other vocation, one of which is the plan upon which the business part of photography has always been conducted—that of the 'survival of the fittest.' This has cut the profits down on business as a whole to such a pittance that it makes honest endeavour meet with probably less remuneration than any other business of the same magnitude; also it has created a less degree of professional courtesy than is to be found in common vocations."

\* \* \*

DIMINISHING prices and profits are obviously the main argument in favour of the suggested combination. We may get some idea of the proposed remedies for the "cutting" of prices which it is sought to introduce by a perusal of a further portion of the manifesto: "We beg you to discuss the matter thoroughly, and to appoint a committee of your very best business photographers to meet a like committee from each State, in Milwaukee, the day before the National Convention convenes in 1900. In the mean time let every photographer give the matter earnest study, and let the committee, as far as possible, find out what is the consensus of opinion and submit the same to the General Committee at Milwaukee. It is suggested by some to have a copyrighted stamp or seal for its members to use on all photographs, and, as the organization grows in strength, to have a standard of proficiency for every applicant for membership; also a Board of Arbitrators to settle 'picture wars' between its members and do all it can in the way of getting all other organizations (labour unions, &c.) not to patronise a non-union man. By others it is recommended to try to get the manufacturers to agree not to furnish material to any one who refuses to hold the price to a certain standard after the arbitrators (who are appointed respectively by the union, the manufacturers, and the parties themselves) have failed to agree." This document is a little vague in parts, and some of its suggestions are clearly impracticable, but the underlying intentions are unquestionably good. We shall watch the course of the proposed experiment with the greatest interest. The machinery of the National Convention

should be a valuable aid in promoting union amongst United States professionals for the purpose of preventing price-cutting and raising the standard of work, and, if it is successful in the first of these objects, it will deserve well of its members and supporters.

\* \* \*

THE many photographers, and particularly those who make a practice of attending the annual conventions, who know Major J. D. Lysaght, will learn with interest that the gallant officer is one of those who sail for the Cape by the *Roslin Castle*, leaving Southampton to-day (Friday, the 20th). This ship takes the first drafts of the Army Corps. So many of us have for years past been accustomed to speak of Major Lysaght as Major Lysaght that it will not seem easy to call him Colonel. But Lieut.-Colonel he now is, and we are sure that we echo a general feeling in expressing a hope that we shall have many future opportunities of calling him Colonel instead of Major. And this means, of course, that we all wish him safely back from the task of chastising his brother "Boer," with a long photographic life in front of him.

\* \* \*

AMONGST those who sailed for South Africa last week was Mr. W. K. L. Dickson, the chief technician of the British Mutoscope Company, who, with his assistants, proposes taking animated photographs in connexion with the hostilities between the Boers and Britons, always assuming, of course, that the proper opportunities present themselves. "Actual events in connexion with the war" are promised, and Messrs. Donald Currie & Co., of the Castle line of steamships, have made arrangements to facilitate in every possible way the return of the photographic films to this country. Imagine what crowds would be attracted to the Palace Theatre of Varieties if the biograph showed a photographic representation of another battle of Majuba Hill—with the defeat of our "brother Boers!"

\* \* \*

WE trust that the sentences of two and three months hard labour passed last week at the London County Sessions on two youths for exhibiting in a public thoroughfare cinematographic pictures of an improper character will act as a warning to the many persons at seaside resorts and other places who have been utilising that adaptation of the cinematograph principle, the mutoscope, for placing on view moving photographs of a risky or suggestive character. This matter has engaged widespread attention for many months past, and the Press, headed by the *London Times*, has published numerous indignant protests against the harm to the morals of the community which these degrading exhibitions must surely work. Not the least regrettable part of the matter was the indifference on the part of local authorities to what was going on immediately under their eyes; but, now that the London justices have dealt out sharp punishment to a couple of offenders brought before them, we may hope that discouragement of an equally emphatic kind will be given in all parts of the country to the prostitution of a beautiful and interesting branch of photography to the base motives of viciously minded showmen.

\* \* \*

MR. R. B. LODGE, of Enfield, has justly gained world-wide credit for his photographs of wild birds in a state of nature, with their nests, eggs, and young; and four years ago his work was singled out for the honour of the Royal Photographic



Society's medal. We have just had the pleasure, for the first time, of examining a series of prints from Mr. Lodge's negatives (which number some hundreds), and must heartily congratulate that gentleman on the patience and skill he has displayed in getting photographs of these shy and elusive sitters. We are conscious, in looking at these tele-photographically produced pictures, that we are beholding the natural life of the feathered world on the rocks, amongst the reeds, in the trees and the bushes. We can conceive of no more effective and convincing aid to the study of this branch of natural history than a set of Mr. Lodge's eminently realistic photographs. A full and priced list of the prints is obtainable from Mr. J. A. Reid, "Kineraig," Cutcliffe-grove, Bedford, and this gentleman also arranges for Mr. Lodge to give illustrated lantern lectures on the subject of bird life, &c.

\* \* \*

THE fact that when it is winter in Great Britain the summer sun is shining at the Antipodes was never more forcibly impressed upon us than a day or two since, when we were glancing through our contemporary the *Australasian Photographic Review*, and the late autumn mists outside were heralding the approach of the dreaded English winter. Our contemporary has a joyful article headed "Welcome Spring!" It is a poetical review of the balmy Australasian seasons from a photographic standpoint, and the writer is revelling in pleasant anticipations of the first blush of spring and a "grand time." Decidedly our Antipodean *confrère* makes us envious of him. From his interesting pages we learn that the Ives and Joly processes of colour photography have, for the first time, been practically demonstrated in Australasia by Mr. Mark Blow of Sydney. We shall be curious to watch the progress of those processes down under. Beautiful though the results are, they have not, to employ the popular phrase, "caught on here" to anything like the extent they both deserve.

\* \* \*

WE have received the first three numbers of *Photographic Life*, published by the *Photographic Life* Publishing Company, Nepera Park, New York, otherwise the Nepera Chemical Company, manufacturers of Velox, &c. The new paper is edited by Mr. W. E. Woodbury, and, while it gives the reader much information of a practical kind, essays, by means of illustrations, quips and cranks, and jokes, to treat photography from a humorous standpoint. In this respect *Photographic Life* is a somewhat novel departure in the journalism of photography. It is very well produced, and will probably attract many readers.

#### MOUNTANTS AND MOUNTING.

IT may seem almost an act of supererogation to many to devote an article to the above simple subject, yet amongst the most frequent queries we have to reply to in the Answers column are those relating to mountants and mounting. Scarcely a week passes without our being asked by one correspondent or another how to mount photographs without the mounts cockling, or how to mount them on the leaves of an album without the same thing occurring. Now, there is no question that a cockled mount is a very unsightly thing, whether it is framed or unframed; also, that an album with its leaves so buckled that the book will not close flat is very ugly. The avoidance of these evils, without the aid of a

rolling press large enough to take the mounts, is, however, no easy matter to overcome; and even with that aid at command, unless certain precautions are taken in the first instance, it is sometimes difficult.

In the case of the prints having to be mounted in an album, the rolling of the pictures is, of course, out of the question, unless, indeed, the album is first taken to pieces, and that is really the proper course to pursue when the best result is imperative. A bookbinder will, however, take the album to pieces and rebind it, after the prints have been mounted and rolled, for a very small sum, and it is somewhat surprising that this is not more often done than it is. We shall here assume, however, that this cannot be done, and see how the best results are to be secured without it.

In the first place, it will be well to consider what it is that brings about the cockling, so that, when that is fully recognised, the conditions for its avoidance, or at least reducing it to a minimum, will the better be understood. When paper, whether in the form of a print or a mount, is moistened with water, however slightly, it has a tendency to expand, and it contracts again as it dries. Hence, when an aqueous mountant is applied to the back of a print, it expands, and, if much water is present, greatly. If, while in this expanded state it be put upon the mount, it is larger than it was when dry; then, as it dries, it contracts again, and in doing so draws the mount with it, and so produces buckling. This is not all, for the moisture in the print also causes the centre of the mount to expand, and thus further increases the evil.

Now, a little consideration will show that, the drier the print and the mount can be kept during the operation, the less will be the expansion, and, consequently, the less will be the cockling. Conversely, the wetter the print is made the more will the difficulty be increased. Many photographers are in the habit of having their prints mounted wet. Now, it will be obvious that this condition, whatever mountant be used, is fatal in the avoidance of cockling with thin mounts without rolling, because the pictures are put on the mounts in their most expanded condition. Even after rolling they often cannot be made perfectly flat if the mounts are very thin.

After what has been said, it will be seen that, if the print be dry and the mountant contain no water, there would be no cockling. Have we such a mountant? Yes; in a solution of indiarubber in benzole. When that is employed, the pictures and the mounts remain perfectly flat. This mountant unfortunately, however, is not at all satisfactory, as it is found, after a time, that the rubber is liable to perish—becomes resinised—and the picture peels off. Alcoholic solutions of different resins would cause no expansion of the paper, but, in practice, they have not been satisfactory for mounting purposes; therefore we have to rely upon aqueous mountants. There are ways, however, in which these may be utilised in what may be termed almost a dry state.

Some years ago Mr. A. Cowan published a dry method of mounting. It was this: the back of the print was coated with starch paste and allowed to dry; the surface of the mount was then slightly moistened with a damp sponge, and the two passed through a rolling press, when perfect adhesion was secured. Here is another method we saw in use in a large Continental publishing house, where the pictures were issued on plate-paper mounts with India tint and titled. The method was this: the back of the print was coated with a thin solution of gelatine, dried, and then trimmed; the India paper was slightly damped between blotting-paper. Next a copper



plate, with the title engraved upon it, was heated and inked in after the usual manner of copper-plate printing. It was then placed on the bed of the copper-plate press, the print put upon it, then the damp India paper, and on that the plate paper, after its surface had been brushed, as is usual with printing on India paper; the whole was then passed through the press. The damp India paper caused the gelatine to adhere to it, and it adhered to the plate paper by virtue of the brushing it had received. In this way the mounting, titling, and plate-marking are done in a single operation. These mounted prints were as flat as if they were copper-plate prints instead of mounted photographs.

As, however, the above methods are not applicable to mounting photographs in albums, other means must be adopted, and, from what has been said, it will be manifest that the object must be to reduce the water in the mountant to the smallest possible quantity, and, at the same time, to get the print into position on the mount before the paper has time to expand to any great extent: the great thing to be avoided is the expansion of the paper. It will be obvious, for this reason, that if, say, starch paste be used, a thick solution, thinly and quickly applied, will cause less expansion than will a thin solution applied thickly. Starch, however, is not to be recommended for our present purpose, because, however thickly the paste be made, it must necessarily contain a large proportion of water.

In the ALMANAC is a formula for a mountant for photographs that greatly minimises the cockling, but success with it depends largely upon conditions as well as the character of the gelatine employed. We propose to deal with this subject in a future article, and show how photographs may be mounted without any cockling whatever even when thin mounts are used.

**The Flicker Photometer.**—This new "light measure" is so named, not, as might be imagined, after its inventor, but from an ingenious application of the flickering produced by uneven illumination, under certain conditions; yet, in a sense, it is a misnomer, as, when the time for measurements arrives, the flickering has ceased. A description of the apparatus, the invention of Mr. O. N. Rood, whose volume on *Modern Chromatics*, in the "International Series," is a most valuable and useful exposition of the subject, is described in the *American Journal of Science* for last month. The construction is formed on the general idea that two beams of light traverse the axis of the instrument and illuminate the two surfaces of a rectangular prism placed in front of the eye. Between the eye and the prism is placed a cylindrical concave lens, which is made to oscillate quickly, and so bring alternately into view, and in rapid succession, each illuminated surface of the prism. When the illumination is uneven, a certain flicker is perceived; but, when equality is brought about, the flicker ceases. The idea appears simple and ingenious, and might prove to point out a ready means of judging of the relative luminosities of various samples of glass, or other media, for dark-room use—a problem closely connected with that of a safe light. Though many valuable experiments in this direction are on record, there yet remains to be tabulated an exact, easily applied, record of the actinic power in relation to actual intensity of illumination of the many coloured media now available.

**Purity of Bromides.**—The purity of the salts employed in the production of the very groundwork of all modern photography, the bromide of silver, is a matter of paramount importance; for, just as the necessity of purity of ingredients and absence of contamination in the silver bath was of essential importance in the wet-collodion process, so must the conditions governing the precipitation

of the bromide be exact, and free from uncertainty, when uniform results are expected. Some years ago an examination of samples of bromide of potassium, obtained from first-class firms, was made, and a table given showing their various deviations from absolute purity. It was found that by far the larger number of samples were contaminated with bromate of potassium, an impurity which, though readily removable, it is true, if its presence were known, would yet, under certain circumstances, be decidedly objectionable. Quite recently, M. Baubigny read a paper before the Paris Academy of Sciences, in which he pointed out the constant presence of chlorine in bromide of potassium; indeed, he states that the very purest sample he could obtain commercially contained 0.01 per cent of that haloid.

THE method he employed for ascertaining the proportion present, which would naturally be always comparatively small, may be interesting enough to quote. About a quarter of an ounce of the bromide and three-quarters of an ounce of sulphate of copper were dissolved in about five ounces of water, and forty-five grains of permanganate of potassium added. A current of air is passed through to carry off the liberated bromine, and the liquid heated gradually to boiling. In about ten minutes the bromine, as tested by the smell, will be all dissipated. About nine grains more permanganate are added, and the liquid heated until fluoresceine paper no longer reacts when held in the vapour. The liquid must not be reduced by evaporation beyond one-half its bulk. All that is then necessary is to titrate the chlorine in the usual way by precipitation with nitrate of silver.

**Deterioration of Oxalic Acid Solutions.**—We were recently asked if we could account for the imperfect action of a platino-type developing solution, which, though it had never before been used, behaved in a manner quite differently from some freshly mixed solution made in exactly the same proportions. Inquiry elicited the fact that there was a large fungoid growth in the solution, which had been made and put aside for twelve months. Now, it is obvious that something must have been disintegrated to produce the fungus, which was quite sufficient to account for any lack of success; but, beyond this, it is well known that solutions of oxalic acid, more especially if exposed to light, gradually become reduced in strength. Some recent experiments by Herr W. P. Jorisson have been in this direction, and a number of interesting facts brought to light. Thus a sterilised solution kept in the dark for 101 days suffered no loss, but, after exposure to the light for half that time, its strength was appreciably reduced. Admixture of sulphuric and of boric acid could not arrest decomposition in the light. Thus a centinormal solution, which, of course, is much weaker than would be used for photographic purposes, was exposed to light for seventy-eight days, and the acid was entirely decomposed. From these experiments we may draw the moral, that all such solutions intended to be kept for stock should first be sterilised by boiling, and then kept entirely in the dark.

#### GELATINO-CHLORIDE PAPER.

M. A. BLANC described recently, before the National Union of Photographic Societies of France, the following method of preparing gelatino-chloride paper, which, he states, has the property of keeping for some time.

The principal feature of his method he states to be the use of a substance for which the free silver nitrate has a greater preference than that of the fibres of the paper. The formula should be strictly adhered to, or else inferior results may be obtained.

First prepare what he calls his

#### "EMULSION CONSERVATRICE."

Alcohol (90 per cent.).....	15 parts.
Pale shellac (in scale).....	5 "
Dissolve by a gentle heat, and pour all at once into	
Boiling water .....	100 parts.

Then filter through absorbent cotton-wool. The whitish-yellow emulsion formed will keep for a long time.



## PREPARATION OF THE SENSITIVE EMULSION.

## A.

Emulsion gelatine .....	9 parts.
Chloride of cobalt (5 per cent. sol.) .....	6 "
*Neutral tartrate of ammonia.....	2 "
Ammonium citrate .....	0.5 part
Water .....	70 parts.

## B.

Citric acid .....	2.3 parts.
Distilled water .....	20 "

When dissolved, add—

Silver nitrate.....	2.5 parts.
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Place the vessels containing A and B in a water bath, and the temperature must not exceed 70° or 80°. Add, all at once, B to A, and then add to

Alcohol (90°) .....	10 parts.
Emulsion Conservatrice.....	5 "

Filter through a tuft of absorbent cotton-wool, and it is ready for use.

He further states that the alcohol facilitates the coating of the paper, the silver chloride gives the great sensitiveness, and the tartrate the vigour; the citrate is a restrainer, the citric acid increases the contrast, and helps with the shellac to keep the paper.

## CONCERNING FLUID SCREENS AND THEIR APPLICATION TO ORTHOCHROMATIC PHOTOGRAPHY.

A lecture given on March 31, 1899, before the V. Section of the Imperial Russian Technical Association, St. Petersburg.

[Translated from the *Photographische Correspondenz*.]

In September 1898 a very interesting photographic treatise by Dr. Nagel, lecturer for the Chair of Physiology at Freiburg-<sup>i</sup>/B., was published in the *Biologisches Centralblatt*, the subject being "Concerning Fluid Colour Screens."

A colour screen is understood to be any transparent coloured medium which has the power to decompose a pencil of mixed white light. One portion of the rays is cut off by the colour filter and the other portion is transmitted. Filters of this kind have been used in photography for a considerable time. Red and yellow glass being absorbers of the chemically active light rays enable the photographer to illuminate his dark room so that he can carry out complicated manipulations with light sensitive substances without their being affected. The discovery of orthochromatic, photographic plates, sensitive to those rays which had been regarded as chemically inactive (non-actinic)—the red, the yellow, and the green—brought about a further extension of the use of colour filters. A want was soon felt for screens that transmitted monochromatic light only, that is to say, rays of a particular colour. In most cases it is no easy task to secure monochromatic rays by decomposing light with a prism, and special difficulties arise in the application of the process, if it is required to illuminate a comparatively large surface with monochromatic light. For the same reason, biologists were also compelled to use light filters. The study of various biological processes of the animal and vegetable kingdoms under the influence of monochromatic light has occupied men of science for some considerable time. By means of such investigations botanists have been able to prove that the formation of starch in the leaves of plants, by the carbonic acid in the air, takes place with greatest activity under the influence of red and yellow rays. The most convenient light filters would be coloured glass, but a pure spectrum colour is only obtainable with deep ruby. Other kinds usually transmit various rays of light, thus giving complicated absorption spectra when examined with the spectroscope. For instance, various kinds of glass which I have examined transmit the following rays:—

Pale ruby glass: red and orange rays (to wave-length 595.5); yellow glass: red, orange, yellow, and green (to wave-length 492); green glass: some orange, yellow, and green (that part of the spectrum between wave-lengths 598.8 and 488.5).

Moreover, as Dr. Nagel has correctly remarked, we seldom find glass of quite even colour. As for gelatine screens, they are quite irregular in colour and not perfectly transparent. They also deteriorate easily under the influence of heat and moisture, and, being stained with aniline dyes, are not permanent, and fade when exposed to sunlight. Among the more perfect light filters, those which contain coloured solutions in glass

\* This may be replaced by the same quantity of Rochelle salts.

receptacles with parallel sides must be included. They are very transparent, perfectly uniform, and transmit much more light than coloured glass or gelatine plates.

Cells for coloured fluids are now made by various opticians. The State Securities Department (St. Petersburg) has four of these made by Zeiss of Jena. But they may be easily extemporised. According to N. Laehtin, they may be made of two squares of thin plate glass separated by strips of thick, flat plate glass of suitable length placed round three of the sides. They may be cemented together with a composition of five parts of resin and two parts of yellow wax. Alkaline solutions must not be used in these cells, as they would form an emulsion with the resin and soon render the cells useless. As the coloured fluids are generally used in 1 c. layers, the parallel walls of the glass cells should be that distance apart. If we now turn to the various coloured fluids, we shall also find that they give very complicated absorption spectra. In the years 1893 and 1894 Hruza and Hazura published a table of such spectra in their work upon "Light Filters and Sensitisers (Strahlenfilter und Sensibilisatoren). These authors examined a very large number of organic dyes and mineral salts. It was found that only few red colours, such as palatine red, A (page 7), tuch red, G, extra (page 10), diamine-scarlet (page 15), and safranin P (page 39); transmitted monochromatic light, even if in very concentrated solutions and in layers 1 c. thick. Solutions of other colours give more or less complicated spectra. I will only instance a few. Amongst yellow dyes, picric acid transmits red, orange, yellow, and green rays; aurantia, red, orange, yellow, and some green rays; chromate of potash, some red, orange, yellow, and green. The green solutions of methyl green and malachite green transmit red, green, and blue rays; sulphate and nitrate of nickel, orange, yellow, green, and blue rays; and chloride of copper, yellow, green, and part of the blue rays. The blue solution of cyanine transmits red, blue, and violet rays, sulphate of copper solution, a small part of the orange and the yellow, green, blue, and violet rays. The violet solutions, methyl violet, ethyl violet, crystal violet, and permanganate of potash transmit part of the orange and the blue and violet rays.

Dr. Nagel found that, if several different pigments are simultaneously dissolved in water, solutions are obtained which transmit monochromatic rays (more or less); but he did not give any details as to weight, as he combined the colours with the aid of the spectroscop, which is much more convenient than making up the quantities by weight. He recommends a solution of lithion carmine as a filter for red rays. Lithion carmine is prepared by dissolving 2.5 grammes of carmine in 100 c. c. of a saturated solution of carbonate of lithium. By diluting this saturated solution with water a fluid is obtained which transmits the red part of the spectrum as far as line, c. In this condition the fluid is rather dark, but it must not be forgotten that the greater part of the light is absorbed and that the transmitted portion of the spectrum is consequently very small. We must also bear this fact in mind in connexion with other colour filters, and especially the yellow, through which only a very small band of the spectrum is transmitted. By further diluting the solution of lithion carmine we obtain, according to Dr. Nagel, a fluid which transmits the red and orange of the spectrum as far as line, d. It is considerably more luminous than ordinary ruby glass, and gives the same absorption spectrum. It is true that lithion carmine diluted to this extent transmits not only red and orange, but also a small portion of the blue rays, but the latter can scarcely be detected with the spectroscop. Hruza and Hazura also noticed this, and included blue in the spectrum of a very dilute solution of carmine. As proof of the transmission of the blue rays through a solution of lithion carmine, I would mention the following facts. It is well known that the blue rays are much more actinic than any other. Many light sensitive substances are apparently only reduced under the influence of blue and violet rays. The emulsion used for ordinary photographic plates belongs to this category. I ascertained the sensitiveness of ordinary Ilford plates by means of the scale of a Warnerke sensitometer, firstly for the rays transmitted by a dilute solution of lithion carmine (with absorption spectrum as far as the rays of wave-length 593.4), and, secondly, to rays transmitted by lithion-carmine and a concentrated solution of picric acid, which latter, it is well known, absorbs the blue and violet portion of the spectrum. The results obtained differed widely from each other.

In the first case ordinary plates (yellow label) exposed for two minutes gave No. 17 W. after development. In the second case, after twenty minutes' exposure, it was impossible to develop any number at all. Ilford isochromatic plates gave No. 17 in the first case after six minutes' exposure, and in the second case after twelve minutes' exposure. I also exposed some panchromatic plates made by Messrs. Lumière upon Dr. Hübl's colour chart. A negative was made with a lithion-carmine filter,



and another with lithion carmine and picric acid. The difference between them is very marked.

I may here mention a very good method, by which to ascertain if an orange-red screen transmits blue rays. If it is placed in front of a screen of saturated sulphate of copper solution (1 c. thick), the light transmitted by both is either brown-violet, or yellowish-brown. In the first case the screen under examination transmits blue rays, as may be seen with lithion carmine, erythrosine, and saffranin. In the second case the blue rays are cut off as with a solution of mandarin, to which I shall refer presently.

Dr. Nagel obtained a coloured screen, transmitting only the orange part of the spectrum between the Fraunhofer lines C and D, by dissolving saffranin and acetate of copper in water. He added to a concentrated solution of acetate of copper, which absorbs the red rays, a few drops of acetic acid, and then added drop by drop a concentrated solution of saffranin, until the violet, blue, green, and yellow rays were also absorbed. In this way a solution is obtained which transmits only that portion of the spectrum lying approximately between wave-lengths 640-600 (661.4-601.1).

**Yellow light filters.**—To a saturated acid solution of acetate of copper, which absorbs the red and part of the orange rays, add drop by drop a saturated solution "orange G" acidified with acetic acid, which absorbs the violet, blue and most of the green rays. A brown fluid is thus obtained which transmits a small band of orange, the yellow and a small part of the green rays, or that portion of the spectrum from 620-570 (610.9-569.4).

A greenish-yellow filter may be obtained, according to Dr. Nagel, by combining solutions of acetate of copper and bichromate of potash, or picric acid. If crystals of acetate of copper are boiled in an excess of saturated solution of bichromate of potash acidified with acetic acid, a green solution is obtained which transmits that portion of the spectrum between 580  $\mu\mu$  and 530  $\mu\mu$ . (I obtained in this manner a solution which transmitted the rays between wave-lengths, 602.2-540.1). If picric acid is substituted for bichromate of potash, the solution transmits that part of the spectrum between wave-lengths 580-520 (according to my experiments between wave-lengths 608.2-499.7).

A green light filter may be obtained by combining a saturated solution of chromate of potash with a saturated solution of ammonio-oxide of copper. The latter is added to the solution of chromate drop by drop until all the red, orange, yellow, and greenish-yellow rays are absorbed. The portion of the spectrum transmitted by this solution lies between wave-lengths 535-495  $\mu\mu$  (according to my experiments between wave-lengths 555-508.0  $\mu\mu$ ). For absorption of the blue-green rays Dr. Nagel adds to the solution a few drops of an alkaline solution of fluoresceine.

The blue part of the spectrum is transmitted by a weak solution of methyl green, but at the same time the extreme part of the red is also transmitted. The latter may be cut off by acetate of copper. To prepare such a filter, add to a solution of acetate of copper a concentrated solution of methyl green, drop by drop. The transmitted portion of the spectrum ranges from about 500-460. By placing in front of this screen another cell containing a weak solution of permanganate of potash, which absorbs the blue-green rays from 582.2-468.2, the part of the spectrum transmitted may be reduced to 486-460  $\mu\mu$ . If we add to the blue solution a solution of gentian violet, drop by drop, we can isolate that portion of the spectrum from 460-430  $\mu\mu$ .

The violet part of the spectrum (from 470-410  $\mu\mu$ ) may be obtained by using two solutions: ammonio-oxide of copper (1 part of saturated solution to 7 parts of water transmits the rays as far as wave-length 541) and a solution of permanganate of potash. As these solutions should not be mixed, they must be used in a double cell. The following table by Dr. Nagel gives the spectra of the light filters we have mentioned.

Dr. Nagel examined his light screens by means of an incandescent burner. As I followed the recipes given in his work, I also used the same source of light. I should add that Dr. Nagel describes very fully and completely how the light filters may be prepared, but I cannot agree with him that their preparation is very easy and simple. As an instance, I may mention the preparation of the green light filters.

Adding the saturated solution of ammonio-oxide of copper drop by drop to the saturated solution of chromate of potash is a very tedious operation, quite apart from the circumstance that more of the cupric solution may be added than is requisite. Moreover, the second solution is diluted in unequal proportions by addition of larger or smaller quantities of the first solution, and its original standard of absorption is thus subject to irregular variation. Lastly, a turbid deposit is formed when some of the solutions are mixed, and this must be removed by filtration. It is therefore very difficult to prepare two light filters which give iden-

tically the same absorption spectrum. Monochromatic filters may be prepared much more easily in another way which I have used for some years.

#### WAVE-LENGTHS ACCORDING TO ÅNGSTRÖM.

	651.2 $\mu\mu$ .	593 $\mu\mu$ .	589.9 $\mu\mu$ .	486 $\mu\mu$ .	430.7 $\mu\mu$ .
	C	D	E	F	G
Ruby glass.					
	C	D	E	F	G
Lithion carmine, diluted.					
	C	D	E	F	G
Acetate of copper with saffranin.					
	C	D	E	F	G
Acetate of copper with orange.					
	C	D	E	F	G
Acetate of copper with bichromate of potash.					
	C	D	E	F	G
Acetate of copper with picric acid.					
	C	D	E	F	G
Ammonio-sulphate of copper with chromate of potash and fluoresceine.					
	C	D	E	F	G
Ammonio-sulphate of copper with chromate of potash.					
	C	D	E	F	G
Methyl green with acetate of copper.					
	C	D	E	F	G
1. Methyl green with acetate of copper.					
	C	D	E	F	G
2. Permanganate of potash.					
	C	D	E	F	G
Methyl green with acetate of copper and gentian-violet, ammonio-sulphate of copper.					




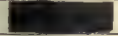


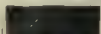
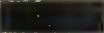

In 1894 the following problem was given me. A specialist offered the State Securities Department a new process for preventing forgery of credit notes. His proposal was to print the design, ornament, writing and protective network in different coloured inks, each having the same effect upon a photographic plate. In this way, by use of photographic processes, it would be impossible to obtain the design of the protective network without, at the same time, including the writing and ornament. It was required to find some method by which the various colours could be separated by photographic means. If the colours could not be differentiated, the process which was offered would be of great value in the printing of credit notes. However, by use of the colour filters I have mentioned and various kinds of orthochromatic plates, I succeeded in photographing the colours separately. By comparing the absorption spectra of various coloured fluids I found that, by combining them in layers 1 c. thick, I could ultimately isolate any portion of the spectrum. For instance, if we take a solution of mandarin G extra, Orange II,\* in proportion of 1 part of saturated solution to 1 part of water, so that only the red and orange rays (to wave-length 590.2 of the spectrum) are transmitted, and, if we also take a solution of sulphate of copper, 1 part of aqueous saturated solution to 4 parts of water, which transmits orange, yellow, green, blue, and violet (that part of the spectrum as far as wave-length 654.6  $\mu\mu$ ), and, if we fill each division of a double cell with one of these fluids, then only the orange rays can pass through the combined filter, for the red rays are cut off by the solution of copper, and the yellow, green, blue, and violet by the solution of mandarin. The requisite strength of the solutions can be determined with sufficient exactitude by means of the spectroscopes. If we take a still more dilute solution of mandarin (1 part of saturated solution to 3 of water) so that

\* This dye (in solution of 1 in 1000) has been used since 1895 by Herr W. Weissenberger as a filter for making the blue negative in three-colour work.



the red, orange, and yellow rays (to wave-length,  $579.3 \mu\mu$ ) are transmitted, and likewise a saturated solution of chloride of copper, which transmits yellow, green, and part of the blue rays (region of the spectrum from wave-length  $589.4$ – $469.6$ ) we have a combination of solutions which transmits pure yellow light. The same solution of mandarin (1 part to 3 of water) combined with a saturated solution of sulphate of copper (which transmits that part of the spectrum to wave-length  $618.8 \mu\mu$ ) gives a small band of the spectrum comprising the yellow and a small portion of the orange rays. Pure green rays are isolated by combining a solution of ammonio-oxide of copper (1 part of saturated solution of copper sulphate, 15 parts water, 1 part ammonia 0.91) with a solution of bichromate of potash (1 part of saturated solution to 10 parts of water), or saturated aqueous solutions of chromate of potash or picric acid may be substituted. I combine the solutions by means of a double cell formed of three plates of glass, the middle of which divides the enclosed space in two sections. In this way the two solutions in the separate divisions do not mix with each other. It is true that by combining the solutions in this manner another reflecting surface is introduced which entails some loss of light, but the diminution is comparatively small. I commend the following table of absorption spectra to the notice of photographers:—

WAVE-LENGTHS ACCORDING TO ÅNGSTRÖM.

	656.2 $\mu\mu$ .	589.3 $\mu\mu$ .	528.9 $\mu\mu$ .	486.0 $\mu\mu$ .	430.7 $\mu\mu$ .
	C	D	E	F	G
	Red	or Y	Green	Blue	Violet.
	C	D	E	F	G
a. Lithion-carmin, dilute					
b. { 1. Mandarin G extra (1 pt. sat. sol.+1 pt. water)	C	D	E	F	G
2. Sulphate of copper (1 pt. sat. sol.+4 pts. water)					
c. { 1. Mandarin G extra (1 pt. sat. sol.+3 pts. water)	C	D	E	F	G
2. Chloride of copper, saturated solution					
d. { 1. Ammonio-oxide of copper (1 pt. sat. sol. sulphate of copper+15 pts. water+1 pt. ammonia 0.91)	C	D	E	F	G
2. Picric acid (saturated aqueous solution)					
e. { 1. Ammonio-oxide of copper solution (as above)	C	D	E	F	G
2. Bichromate of potash (1 pt. sat. sol.+10 pts. water)					
f. Picric acid (saturated aqueous solution)					
g. Mandarin G extra (1 pt. sat. sol.+1 pt. water)					
h. Chloride of copper (sat. sol.)					
i. Ammonio-oxide of copper (1 pt. saturated solution of sulphate of copper+6 pts. water+1 pt. ammonia)					

I will now proceed to the application of these light filters to photographic purposes.

It would be particularly interesting to ascertain the sensitiveness of various kinds of orthochromatic plates for the pure colours of the spectrum by means of some kind of sensitometer. It is only by such means that we can arrive at a quantitative expression of the capacity of various sensitizers to increase the sensitiveness of photographic plates for the various rays. In such a manner only can we ascertain the exact difference between two sensitizers of similar character, as, for instance, eosine and erythrosine. Moreover, as soon as we can ascertain definitely for which rays the plates in question are least sensitive, we can illuminate our dark room with that kind of light. For this purpose I have constructed a lantern, the front of which is made of a double glass cell consisting of three parallel glass plates. The two divisions may be filled with any suitable coloured fluids to isolate any particular kind of monochromatic light. Unfortunately, I have not yet had sufficient spare time to make an exhaustive series of experiments. For this purpose it would

be necessary, by means of a constant source of light, to measure photo-metrically the quantity of light transmitted by each colour filter, and thus ascertain the most suitable type of sensitometer for the series of experiments. I have only made a few experiments in this direction, but they may be of interest to the practical photographer. I selected for my experiments three colour filters of approximately the same intensity, namely, a saturated solution of picric acid; as green-yellow filter, a combination of the solutions of acetate of copper and picric acid; and, as red-orange filter, a combination of lithion-carmin solution and picric acid solution (it would be more convenient to use solutions of mandarin of suitable strength). The first, a pale yellow solution, transmitting the red, orange, yellow, and green rays to wave-length  $498.8 \mu\mu$ , divides the spectrum in two parts, namely, a slightly actinic half and an energetic chemically active half. It would also be interesting to thoroughly investigate the sensitiveness of orthochromatic plates to the action of all the less active rays. Orthochromatic plates may be divided into those which are sensitive to red or to green light. I have endeavoured to ascertain the sensitiveness of these two colours by means of two other colour filters, which also divide the less actinic half of the spectrum into two parts. The sensitiveness of the plates was determined in the following manner. Having made a hole in the wall of the dark room, I inserted therein a Dallmeyer lens and placed in front of it a spirit lamp with an incandescent burner rather nearer than the focal point. I found this light sufficiently constant, inasmuch as I obtained the same number from a series of exposures with the same kind of plates. The light filter was placed immediately in front of the lens. In the dark room I obtained a conical, divergent pencil of coloured light, and I placed the plate covered by the Warnerke sensitometer in such a position that the whole surface of the scale was illuminated. I had, of course, removed the phosphorescent tablet. The following plates were tested: Ilford Ordinary (yellow label), Ilford Chromatic, Edwards' Isochromatic, Lumière's Panchromatic, and Smith's Orthochromatic (red mark). I first ascertained the sensitiveness of the various plates by means of the phosphorescent tablet, and then tested their sensitiveness for coloured light. The numbers secured are given in the following table, the sensitiveness of the Ilford Ordinary plate being taken as the unit. With the red filter, however, the sensitiveness of the Ilford Chromatic plate was taken as the unit.

The Ilford Chromatic plates were found to be the most sensitive to green, and Lumière's Panchromatic to red. Smith's plates were found less satisfactory in both respects. These results brought me to the conclusion that for subjects in which green predominates it was best to use Ilford Chromatic plates. On the other hand, where red, warm tones predominate, Lumière's Panchromatic plates would do good service.

The application of monochromatic light filters and corresponding orthochromatic plates could, by means of Burinsky's\* system of colour separation, lend valuable assistance in the examination of doubtful documents. Moreover, it is easy to select from the light filters here enumerated, those which may be used with greatest advantage in conjunction with suitable orthochromatic plates for making negatives for reproductions by the three-colour process. In conclusion, I would draw attention to the following three-colour filters: (1) a solution of ammonio-oxide of copper (1 part of saturated solution of sulphate of copper + 6 parts of water + 1 part of ammonia; (2) a solution of mandarin (1 part of saturated solution + 1 part of water), which transmits the orange-red rays; (3) a solution of chloride of copper, which transmits only the yellow and green rays. These three in conjunction transmit the entire spectrum, and supplement each other. It therefore follows that, if the rays transmitted by these solutions are projected simultaneously upon a screen, we should have white light, but I have not yet had an opportunity to verify this. If, however, this conclusion is found correct, these light filters should be very suitable for Ives's Photochromoscope.

	Phosphorescent Tablet	Yellow Filter.	Green Filter.	Red Filter.
Ilford Ordinary (yell w label)	17 W. 1	2 min. 17 W. 1	2 min. 17 W. 1	20 min. No action. 0
Ilford Chromatic	17 W. 1	5 sec. 24 W. 168	30 sec. 25 W. 30	12 min. 17 W. 1
Edwards' Isochromatic	23 W. 1	15 sec. 25 W. 72	1 min. 25 W. 18	12 min. 18 W. 1½
Lumière's Panchromatic	23 W. 5	30 sec. 25 W. 36	1 min. 23 W. 10	1 min. 19 W. 21
Smith's Orthochromatic (red mark)	15 W. 1	5 sec. 17 W. 24	30 sec. 20 W. 9	12 min. 8 W. very feeble.

ALEXANDER POPOWITZKY.

\* Burinsky, photographic specialist for doubtful documents to the St. Petersburg District Court, whose photographic treatise was published in 1896 in the *Bulletin der Kaiserlichen Akademie der Wissenschaft.*



## EDER'S EXPERIMENT CONCERNING THE LATENT IMAGE.

(Translated from the *Photographische Correspondenz*.)

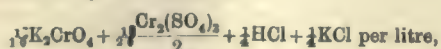
THE following facts may perhaps contribute somewhat to the elucidation of the debate concerning the nature of the latent image.

It is known that the Eder experiment fails if pressure is absent when metallic silver is brought into contact with a bromide plate and subjected to development. This is explained by the fact that the area of contact is too small. In order to obtain satisfactory contact, the metal should be rubbed in as a powder, but this would give rise to the formation of an image due to pressure. To avoid this difficulty, the experiment can be made with a moistened plate. If we take a moistened plate and rub part of it with silver powder, and another part with some substance free from silver, such as powdered quartz or glass, the plate, when developed in presence of these substances and washed, will show that reduction has taken place under the influence of the silver powder, but not under that of the inert substance. A differential experiment will prove that the blackening of the film is not due to silver powder which has not been washed off. If we wash the plate before development, so as to remove the powder which has been rubbed upon it in the moist state, the developer will not cause any reduction. If we rub sub-bromide of silver upon the film in place of silver, the image will be much more intense. The former may be prepared by partially bromising silver. In consequence of pulverisation being more complete in this case, there is greater area of contact between the primary silver bromide, the developer, and the silver reduced from the silver sub-bromide. The intensity of the image is therefore greater for the same period of development.

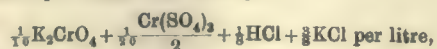
With reference to the question as to the nature of the latent image, I am impelled to the conclusion, from experiments which will shortly be published in the *Zeitschrift für Physikalische Chemie*, that, if we exclude the presence of gelatine, both the latent and the visible images formed by light upon chloride and bromide of silver are sub-chloride and sub-bromide of silver, their respective chemical composition being  $\text{Ag}_2\text{Cl}$  and  $\text{Ag}_2\text{Br}$ . The experiments favouring the older opinion may be briefly stated as follows:—

Take a number of strips of glass covered with silver haloid, free from gelatine, obtained by deposition in presence of an excess of haloid, and expose them under a photometric scale. If we immerse them in a series of solutions, with potentials of oxidation for the said halogen ions, arranged in a descending scale, we shall find that the latent and visual images are destroyed by the solutions exceeding a certain potential of oxidation, and that they remain unaffected by the solutions below a certain potential. From this it appears very probable that the latent and visual images are formed of the same substance. These oxidising agents may be prepared by decomposing chromate-chromic solutions with various quantities of acid.

The visual and latent images of silver chloride were destroyed, that is to say, converted to  $\text{AgCl}$ , by a solution of

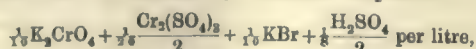


with an oxidation potential of about 1.5 volt. On the other hand, they were unaffected by a solution consisting of

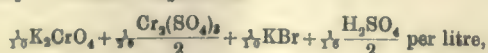


with an oxidation potential of about 1.4 volt.

Bromide of silver was bleached by a solution composed of



with an oxidation potential of about 1.2 volt, whilst both images were left intact by a solution composed of



with oxidation potential of about 1.1 volt.

In order to obtain some explanation of the nature of the latent image, I took a weighed quantity of silver, and converted it to silver chloride, in stages by means of chlorine water, each addition containing  $\frac{1}{10}$  the quantity of chlorine that would suffice to convert the entire mass. After each addition, I ascertained with an electrometer the oxidation potential of the remaining chlorine. At first the oxidation potential remained constant at 0.55 volt, but suddenly sprang to 1.45 volts as soon as half the silver had been combined with the chlorine (corresponding to the combination  $\text{Ag}_2\text{Cl}$ ). It then remained fairly constant at 1.45 volt,

under the addition of further chlorine, until the whole of the sub-chlorine was converted to chloride of silver. A similar experiment with silver + bromine also gave a leap from 0.40 volt to 1.15 volt at the stage  $\text{Ag}_2\text{Br}$ .

As the transformation of the silver sub-haloids to normal haloids also takes place in the chromic solutions at the dividing lines represented by the respective oxidation potentials 1.45 and 1.15 volt, I think these experiments show that it is highly probable that the visual and latent images are of the composition  $\text{Ag}_2\text{X}$ , at least in the case of  $\text{AgBr}$  and  $\text{AgCl}$ , free from gelatine.

DR. R. LUTHER.

## THICKNESS OF FILM.

ON Thursday evening, October 12, Captain Abney (the President of the Camera Club) gave one of his attractive discourses at the Camera Club, the subject being an inquiry into the influence which the thickness of coating has upon the sensitiveness of a gelatine plate. The lecturer commenced his remarks by calling attention to the circumstance that, when light falls upon a photographic plate, a certain amount is reflected, a good deal passes through it, and some is stopped, and that in this stoppage the light must do work of some kind, whether that work be in the form of heat, electrical action, or chemical action. No plate is absolutely opaque, but will allow a considerable amount of light to filter through it.

Every one likes to work with a well-coated plate, and avoids one which has been half starved, because with the plate well favoured in this respect better results are obtainable. The reason why this is so does not trouble the ordinary worker, but a few experiments will make the reasons evident. It is an unfortunate thing that it is a physical impossibility to slice a gelatine film so as to divide it into different strata for the purpose of detailed examination, but we can arrive at much the same goal by taking a number of Kodak films, the coating of which is wonderfully uniform, and binding them together under pressure so as to form one compound film. He had taken six such films, pressed them into close contact, and exposed them to light for periods of 5, 10, 20, and 40 seconds, &c. The films were then separated, placed face upwards, and developed simultaneously. After fixing and drying, their opacities were measured by means of a Warnerke annulus, of which the lecturer showed a lantern slide.

The results showed that only seventeen per cent. of the light which fell upon the top film registered itself on the one beneath, while No. 3 of the series only received three per cent. Experiments showed that, if half the amount of silver had been used in the composition of the top film, forty-two per cent. of the light would have passed through it.

Once upon a time there were starved films of this character upon the market, and the lecturer had calculated that, if only one-third more silver were used, it would have increased their sensitiveness about ninety per cent.

A number of diagrams were shown in illustration of the various points touched upon, one especially being of a very conclusive character. It took the form of a number of squares, pieces of exposed plates all of the same brand, and presumably containing the same proportions of silver, but varying in thickness of coating. The thicker films showed a remarkable contrast in density to the thinner ones, although all had been simultaneously developed under precisely the same conditions.

Captain Abney said that his excuse for bringing these observations before the notice of the Club was the reflection that matters of theoretical interest may become of practical value. The study had been of extreme interest to himself, and he had felt that previous conclusions at which he had arrived would possibly have to be modified because he had failed to take into account this question of thickness of film. Small errors might in this way have crept in, but whether, in his busy life, he should ever find time to make the necessary corrections, a work which might occupy many months, he was unable to say. Perhaps one of his hearers might feel inclined to take the burden from him.

Sir H. Trueman Wood, who occupied the chair, remarked upon the valuable nature of Captain Abney's researches, but doubted whether the results of superposed celluloid films were comparable with one thick film such as might be attached to a glass support. He suggested that more reliable results might be gleaned by employing multiple films, each separated by soluble gelatine, so that the components might subsequently be separated for experiment. (Captain Abney here intimated that he had tried this plan and had obtained identical results as with the celluloid.)

Mr. Cadett, speaking from a manufacturer's point of view, said that the maker of commercial plates was heavily handicapped. No one would grudge a little extra silver in the plates which he made, but such generosity led customers to complain of slow fixation. People grumble, too, if plates take too long to dry. Beyond these difficulties there are some of a more practical nature. There is, first of all, the danger of precipitation, and, if to guard against this extra gelatine be added to the emulsion, the time of drying is enormously prolonged, which is no small matter in a climate such as ours. Captain Abney had experimented with separate films, but he had not, apparently, tried to cut sections from one film. In the course of coating a plate the larger grains are apt to sink downwards nearest the glass, and that part of the film is more sensitive than the top surface. He once took a jar of emulsion and



tested it for sensitiveness, finding that the lower part was six times more sensitive than the topmost layer.

Mr. Sanger Shepherd expressed the belief that the development of six separate films as described by the lecturer cannot give the same result as the development of a single film of a thickness equalling the six, because the development would take a certain time to work through the thickness of that one film.

After other speakers had joined in the discussion, the meeting was brought to a close by a few words from the lecturer, and a hearty vote of thanks to him for his admirable paper.

#### TECHNICAL CONTROL FOR PICTORIAL PURPOSES.

MR. W. THOMAS, F.R.P.S., lectured on the above subject before the members of the Leeds Photographic Society, on Tuesday, October 10. Mr. Godfrey Bingley presided over a large meeting.

At the outset of the lecture Mr. Thomas defined technique as being a full appreciation of the different implements available and of the variations possible by employing each or all as needful, together with a knowledge of the limitations inherent to photography and the means of minimising the effects of such limitations. When photography, however, was taken up for the sole purpose of pictorial expression, the lecturer claimed a wider definition, and asked that the utmost latitude should be allowed to each in their endeavour to interpret nature, at the same time pointing out that a light-made image is of such subtlety as to resent all but the most skilful interference, and that a boundary line must exist, beyond which it is dangerous to trespass.

Mr. Thomas urged the importance of workers becoming absolute masters of the tools employed. Until this was accomplished and a correct knowledge of relative light and shade acquired, it was not safe to play tricks in pictorial work, lest perchance suns be shining from all directions, and shadows where none could exist.

Dealing with practical matters in the field, the lecturer pointed out the necessity of having an absolutely rigid tripod, and, regarding the lens, it was necessary to have, not one, but several lenses of different foci, the superiority of long-focus lenses for pictorial work being explained and illustrated.

Focussing and the question of diffusion of focus was dealt with, and Mr. Thomas urged that each subject must have independent treatment in this respect, sharp definition being required in some cases, while in others a more or less amount of diffusion was desirable.

Treating of exposure, various slides and negatives were shown on the screen, the lecturer pointing out defects and how they might be overcome, and it was shown how a subject of great contrasts might be improved by control during development, the particular illustration being a pond in the foreground, lighted by the sunset sky, with a dark belt of trees in the middle distance, which had been saved by preliminary development in weak rodinal, the shadow portions being brought up by local application of stronger developer, the plate being frequently rinsed under the tap to prevent hard lines.

Mr. Thomas seemed to favour rodinal as a developer, and, when working, prefers to have three different solutions in hand, one of normal rodinal (1 in 30), a second of weaker rodinal (1 in 60 or 90), and a third, generally of hydroquinone, to give density. Working on these lines, it is possible to deal with plates having varied exposures by commencing development in the normal solution and transferring to the weaker rodinal or the well-restrained hydroquinone as the plate shows signs of under or over-exposure.

Isochromatic plates were strongly recommended as giving a more faithful representation of colour subjects, particularly in sky photography, and attention was called to their power, especially when used with a pale yellow screen, of clearing up mist or hazy distance should such appear too exaggerated.

A large number of slides were thrown on the screen, illustrating problems of exposure and questions of tonality, and it was shown how considerably the ultimate result might be controlled by an intelligent use of the factors of exposure, choice of plate, development, and after-treatment.

The subject was dealt with in a thoroughly practical manner, and was much appreciated by the audience, who, at the close, accorded Mr. Thomas a very hearty vote of thanks. J. C. C.

#### INDUSTRIAL EXHIBITION AT EDINBURGH.

THE Edinburgh and Mid-Lothian (Home Workers') Third Annual Competitive Industrial Exhibition (there's a lengthy title exhibition promoters may envy) was held in the Waverley Market, Edinburgh, last week. This Exhibition, taken all over, is a huge affair, with over 3600 entries, comprising almost every variety of home work, and it is a popular entertainment with the good folks of Auld Reekie. The photographic section has over 400 entries compared with 175 last year, and 35 classes compared with 15 last year. This great multiplication of classes seems a mistake, but probably Mr. Hutchinson knows the pulse of the visitors as to what they like and acts accordingly. As may be supposed this

Exhibition is visited by huge crowds—the Royal Engineers' Band is a great attraction—who would never think of entering a photographic exhibition. This opportunity of securing the attention of the general public is, with one or two exceptions, neglected by the professionals. The exhibits comprised, as might be expected, all qualities of photographs—good, bad, and indifferent—and, as might be expected with so much subdivision, some of the classes were poorly represented. Last year the photographs were exhibited on tables, but this year they were hung on screens erected in the Market, a considerable improvement, although the many conflicting lights were rather confusing; the arrangement of the different photographs also left much room for improvement. The Judges were Mr. Alex. Edington, F.S.I., President of the Edinburgh Photographic Society; Mr. John Warraok; Mr. R. Ayton, President of the Edinburgh Photographic Club; and Mr. Frank J. Moffat. Unfortunately, on the occasion of our visit, the second day of the Exhibition, the awards were not notified, nor was a prize-list available, so a detailed note of the awards is impossible. The special prize presented by the *Evening News*, in the open class, was awarded to Mr. Alex. Allan, Edinburgh, for *Load of Hay*, a picture that was medalled at the Edinburgh Photographic Society's Exhibition this spring. Mr. Allan is one of Edinburgh's most promising amateur exhibitors, and, it may be remembered, besides taking the prize last year, also took the "confined to members" gold medal at the Edinburgh Photographic Society's last show with *Mary*, a picture, by the way, that also appears in this Exhibition. In the "amateur" (which means in this Exhibition those who have never taken a first prize), the *Evening News* prize goes to Mr. T. A. Sands, Birmingham, for a summer landscape. Other leading prize-winners are Mr. Chas. M. Wane, Edinburgh; Miss Mary C. Eames, Llangollen; Mr. E. R. Collins, East Dulwich; Robert Puman, Edinburgh; Miss Buchanan, Edinburgh; Mr. John R. Clark, Whitehaven; Mr. W. G. Brown, Penicuik; Mr. W. J. Croall, Edinburgh; Mr. E. L. Brown, Edinburgh; Mr. J. K. Home Crawford, Portobello; Miss Fleming, Edinburgh; Mr. M. T. Anderson, Edinburgh; and Miss M. G. McLachlan, Blairgowrie. Mr. C. M. Wane had several good figure studies on exhibition, while his different examples of rapid-shutter work—horses leaping, &c.—were marvels of technique, while pictorial excellence was also evident, while his "swan" studies were as taking as ever. Mr. Byrne, Richmond, had hard lines with a number of lovely "child" studies, "too late for competition," and as a comrade in misfortune he had Viscount Maitland, who had a number of his well-known works forward, also unfortunately too late. Mr. W. F. Slater, London, had several good photographs forward, including his well-known *Pelican*, which had a duplicate in Class 41—at least as to subject. Mr. W. J. Croall's *Sporting Dogs at Work, Sunset on the Forth*, &c., quite held their place in the opinion of critics, while his *Greyhound* was a fine specimen of "doggy" portraiture. Mr. E. L. Brown had a well-arranged group of *Pomeranians* on show, but the colour hardly suited the subject. One was astonished to find a number of photographs entered in the name of a private competitor, with the words "Scottish Portrait Co." on the face of them. A disappointing feature was the large number of indifferent P.O.P. prints on exhibition.

If the managers would arrange to have the exhibits in proper order, with the prize-winners duly noted, they would remove the cause of the many complaints we heard from visitors during our walk round.

#### PHOTOGRAPHY APPLIED TO TEXTILE DESIGNS.

In the opening of the twenty-sixth session of the evening classes at the Textile Department of the Yorkshire College at Leeds, on Wednesday evening, the 11th inst., Professor Beaumont gave an account of the new photographic method of preparing textile designs invented by Jan Szczepanik, which he had recently been studying in Paris. The object of the appliances, it was explained, was by mechanical means to enlarge the artistic sketches of the designer, and to transfer the design to ruled or point paper marked with millions of dots arranged in the order proper for the development of the pattern in the weaves. Szczepanik printed the design by a photographic process on sensitised paper, and by his method the process of applying the weaves was governed, not by the skill of the artist or his assistants, but by natural laws. Inaccuracies in shading were thus made impossible, for the change in the weave is absolutely identical with the toning of the negative. Designs which now took weeks, and even months, to prepare for the loom would by this new method be mechanically worked out in a few hours. For instance, in six hours a design in silk tapestry, 176 square centimetres, or about 35 square inches, in extent, had been prepared. It might be imagined that this ingenious and novel invention was calculated to have an important influence upon the branches of the weaving industry relating to the manufacture of all elaborately figured fabrics, especially if the designs worked out photographically were legible for all practical purposes. It was recognised, of course, that there must be limitations to its utility, as there were to all mechanical and automatic appliances. Yet, if it could be employed in accelerating the process of designing large patterns, it should have the serious attention of all who desired the further development of the weaving industries. It was a mistake to think that, if the invention became commercially useful, the sphere of the designer would be considerably restricted. In the long run, innovations of this kind,



though at first they might dislocate certain branches of employment, enriched the industry in whose interests they had been introduced. The place of the designer, the brain worker in textile factories, could not be assumed by inventions of this kind.

The chair of the lecture was occupied by Mr. G. H. Nursey, vice-chairman of the Textile Industries Committee, and over 500 manufacturers were present from all parts of the country.

### VICOL.

At a meeting of the London and Provincial Photographic Association, on October 5, Messrs. Berger & Co.'s representative attended to describe and demonstrate Vicol printing out paper for the quick and easy production of coloured photographs. The paper, it may be explained at the outset, is made with matt and glossy surface, and, whichever it may be, it always presents a rose tint before toning and fixing, after which turning to a delicate mauve. Printing is done in the same way as with ordinary P.O.P. The prints are then washed for ten minutes in running water or several changes, and afterwards soaked for two or three minutes in—

Common salt .....	1 ounce,
Water .....	20 ounces,

with constant motion. After a further washing for ten minutes, the prints are ready for toning, and any recognised bath will serve. The following is, however, especially recommended:—

A.	
Ammonium sulphocyanide .....	150 grains.
Water .....	15 ounces.

B.	
Gold chloride .....	15 grains.
Water (distilled or boiled) .....	15 ounces.

Two ounces of A added to 16 ounces of water, mixed with 2 ounces of B, constitute the bath. After toning, the prints are washed for five minutes, and then immersed in a freshly mixed fixing bath, made up of—

Hypo .....	3 ounces.
Water .....	20 "

The final washing should be for about an hour, but in hot weather this may be followed up by treatment in an alum bath for five minutes—

Alum .....	1 ounce.
Water .....	20 ounces.

The hardening bath must be followed by five minutes' washing before any colouring is attempted. For the colouring process three solutions are required as follows:—

- A. Citric acid, 5 ounces in 95 ounces of water.
- B. Sodium hydrate, 3 ounces in 97 ounces of water.
- C. Pyrogallie acid, 1 ounce in 99 ounces of water.

Smaller quantities may, of course, be made, but the proportions must be preserved. The mounted prints are then taken, and the solutions applied with a camel's-hair brush, the surface of the print being previously lightly sponged. The A solution gives flesh tints, the B solution blue tones. Green is obtained by following up B solution with C solution, the depth of the green varying with the strength of the C solution. The weaker the C solution, the paler the shade of green obtained, but, if it should be too strong, the colour will tend towards brown. Brown and buff-yellow tints are secured by first proceeding as for green, followed after the surface has dried by solution A. A strong C solution gives deep browns, and it must be well diluted for yellow tints. The process has its advantages and disadvantage. One of the former is its cheapness. A few pennyworths of chemicals will make solution sufficient for many years' use. Washing soda generally contains enough sodium hydrate for the purpose, and may be used in place of the hydrate. After cheapness may be mentioned the advantage it offers to the professional. Hitherto not much colouring work has been done by professionals because of the time it calls for by other methods. Vicol, however, renders the delicate work of colouring the face a matter of but a few seconds. Another advantage named was that skill and care were not absolutely essential, and it was shown that, though one might splash the solutions about, the final result need not suffer. The process presents a cheap and tasteful method of preparing show cards, menu cards, &c., in colours by photographic means, and for landscape work it also has much to commend it, nearly every shade of green as well as brown being now possible. Before proficiency is acquired, it may be necessary to experiment on a packet or two of paper; but, on the other hand, some hit success from the first. Vicol should be specially useful in medical and X-ray photography, where the flesh, the veins, and the bones could be differently coloured, and for machinery photographs it is expected to compete with the ferro-prussiate process. The demonstrator proceeded to colour a number of prints before the meeting, showing the suitability of the process for portraits. If the matt paper be used, the general flesh tints of the citric acid solution may be enhanced by crayon or other working up. The makers only ask for a fair trial of the paper. Many had exposed the results to conditions which it would not be possible for any coloured photography to

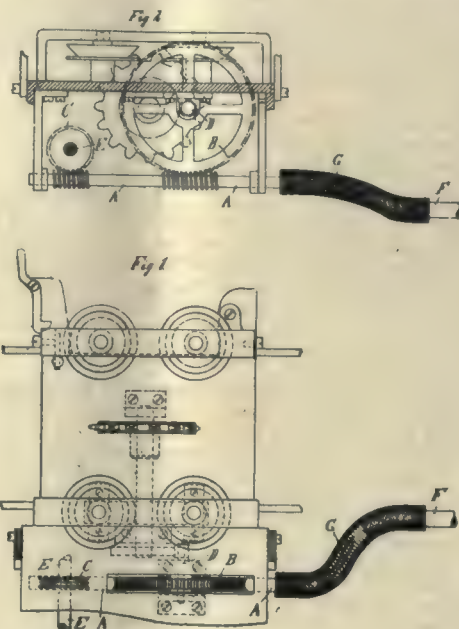
withstand, in direct sunlight and so on, and yet were surprised at their going off. The colouring could be as easily done before the mounting of the print; in fact, as it is taken from the washing water as after it is mounted. A great deal depended upon well sponging the coloured print when dry with water to remove any excess of acid, &c., and, if this be done, the result should be as permanent as by any other process. The speaker laid some stress upon the mountant being neutral.

Mr. Walter D. Welford said he had tried the paper, and showed his results. He found no great difficulty in mastering the process, and had only failed once. His prints were far more delicately tinted than most of those shown, and in some cases efforts at translating a sunlit sky had been made. He found that the pyro solution was very strong at one per cent. He diluted this again considerably with every success. He found, as it was stated, that the toning formula was unimportant, and had employed the bicarbonate bath. He found nothing gained by sponging the surface of the print before tinting. It was easier to manage dry. The caustic soda played havoc with the camel's-hair brushes, but he was told that a hog's-hair brush might be used instead.

A long discussion ensued, chiefly upon the claims to permanence which are made for the process and other points of detail, and the meeting closed with a hearty vote of thanks to the demonstrator and his assistant.

### SIMULTANEOUSLY OPERATING ANIMATED PICTURES AND THE PHONOGRAPH.

In this device, which is the invention of Herr Malke, to the shaft, D, is attached the pinion which drives the transport wheel for the block of pictures, and this shaft carries a worm wheel, B. E is the operating shaft for the phonograph, having a disc, or the gramophone, with the well-known roller, and the shaft, E, carries a second worm wheel, C. Transversely to the shafts, D and E, is mounted a shaft, A, having thereon two



worms, one engaging the wheel, B, and the other the wheel, C. The shaft, A, is coupled by means of a flexible shaft, G, to the driving shaft, F, and thus, when set in motion, drives both the shafts, D and E.

The advantage of the flexible connexion, G, is that the working of the parts is very quiet and even; and then, again, in accordance with this arrangement, the worm shaft, A, and the driving shaft, F, need not necessarily be in line or concentrically arranged.

### "SPIRIT PHOTOGRAPHY" BY FLASHLIGHT.

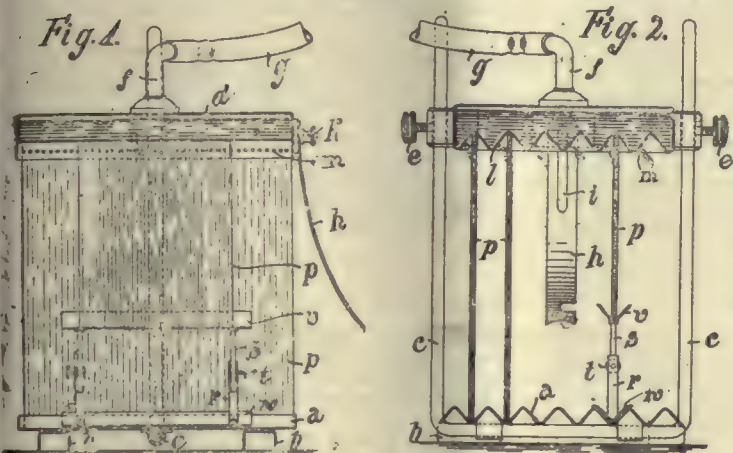
According to an Australasian contemporary, Mr. Mark Blow, of the Crown Studios, Sydney (N.S.W.), has had the temerity to attempt to catch the spirits on the hop. He had the good fortune to be present at a séance when Madame —, a professional medium, called forth her attendant spirits, and so the daring photographer, by invitation, put in an appearance, well equipped with a reliable camera and instantaneous plates. The lens was carefully directed to the exact spot where the other-world visitors were to present themselves. After some time of anxious waiting a gentle voice announced, "The spirits are ready." Mr. Blow had no time to spend in posing, as his bent desire was to de-



pose. In an instant the flashlight fizzed and the deed was done. Again everything was still, save the quiet reversing of the dark slide in the camera, when the voice of the medium, in a gentle "Here they are again," let the photographer know this was his opportunity. Another flash followed, and the spirit-slayer felt satisfied, if there be any impressions for the plates, he had secured them. What care and anxiety Mr. Blow displayed in developing those negatives we must leave him to tell. It was not a case of either under-exposure or over-exposure; neither pyro ammonia, pyro soda, nor all the new developers combined, could draw from those faithful plates a testimony that they had seen anything. Either one of two things must account for the absence of an impression, the plates were not quick enough for the spirits or the spirits were too quick for the plates. One thing is very evident, the spirits can't stand the flashlight.

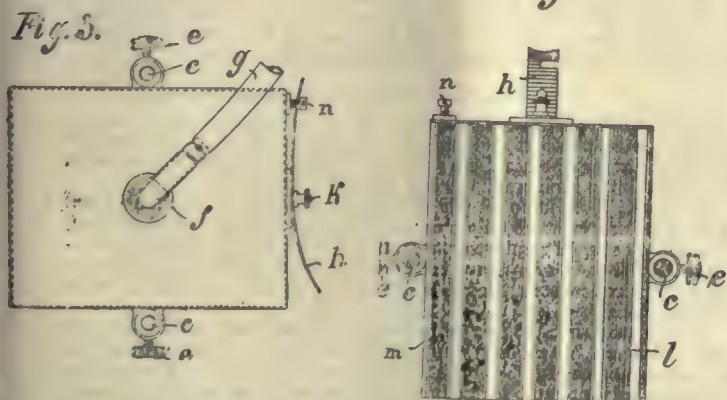
#### A PLATE-WASHING APPARATUS.

THIS apparatus, the invention of Herr Geiger, consists of a frame constituted by a bottom plate having an undulating, corrugated or ribbed upper surface, provided with lateral guide rods, and a water reservoir adjustably arranged on said guide rods and provided on its under surface also with undulations, corrugations, or ribs, which undulations are provided with a series of small oblique perforations arranged close to each other and directed towards one side, through which the liquid is intended



to issue in spray against the film side of the plate, which plates are held between the two corrugated plates.

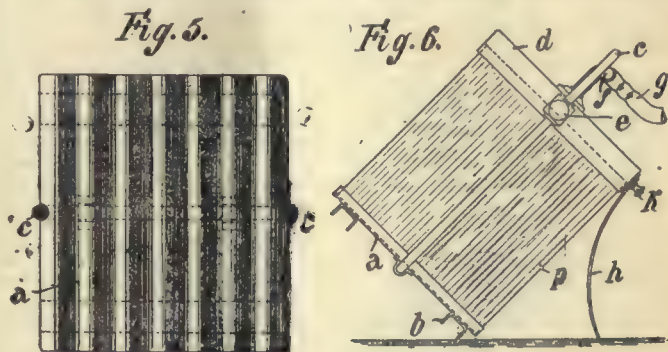
The corrugated plate, *a*, is provided with feet, *b*, and with a bent guide rod, *c*, or vertical rods on which slides a suitably shaped water reservoir, *d*, which can be fixed in any vertical position on the rods by means of set screws, *e*. The reservoir is provided at the top with a pipe, *f*, for



receiving an indiarubber tube, *g*, through which the water is admitted to the reservoir. The bottom, *l*, of the reservoir, *d*, is corrugated, the corrugations of which are provided with rows of perforations, *m*, directly obliquely downwards, for the purpose of directing and spraying the water from the reservoir, *d*, on to the film side of the plates, *p*, the plates being held between the bottoms of the upper and lower corrugations, *a* and *l*, respectively. On one side of the sides of the water reservoir, *d*, is

arranged a bent metal strip, *h*, provided with a longitudinal slot by means of which it can be adjusted as regards length and secured by a screw, *k*, in order to support the apparatus in an inclined position, which metal strip is secured, when not required, by a small screw, *n*, as shown in figs. 3 and 4. When the washing or treatment of the plates, *p*, is finished, the apparatus is tilted into an oblique position for the purpose of allowing the water to run off and the air to pass freely through, and is propped up by means of the metal strip, *h*, the latter having been fixed to the required height, as shown in fig. 6.

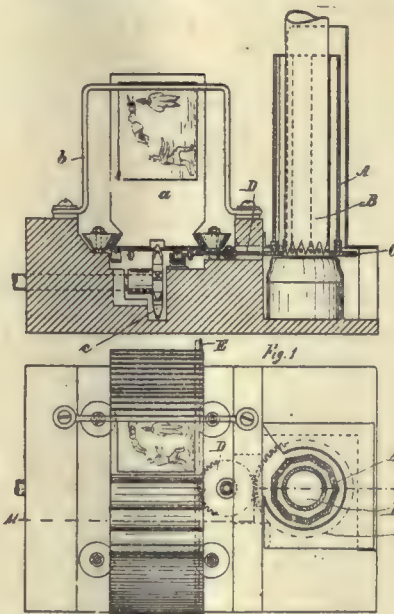
In order to treat in this way, and simultaneously, several plates of



different heights, a special device is provided, which consists, as represented in fig. 2, of a metal strip, *w*, bent so as to fit into a corrugation of the plate, *a*. This metal strip is provided with two or more tubes, *r*, projecting upwards, provided with rods, *s*, the height of which is made adjustable by means of set screws, *t*. These rods carry at their other ends a bent metal strip, *v*, corresponding in direction with the corrugations of the lower supporting plate.

#### ILLUMINATING ANIMATED PHOTOGRAPHS.

In this device of Herr E. Maile the animated pictures are produced from a block of leaves containing pictures of a series of successive positions of a moving figure or of moving figures. The block containing the leaves, *a*, is mounted on a suitable base plate, and this plate is moved by suitable means under a bar or bow, *b*, so that, as it passes under the same,

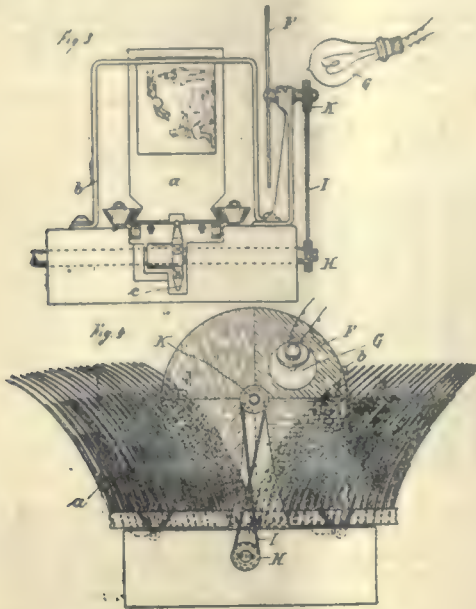


the leaves are rapidly turned over, and the effect of an animated picture attained. The base plate may be moved by a star or chain wheel, *c*, which engages in orifices in the bottom of the said plate, or by any other means.

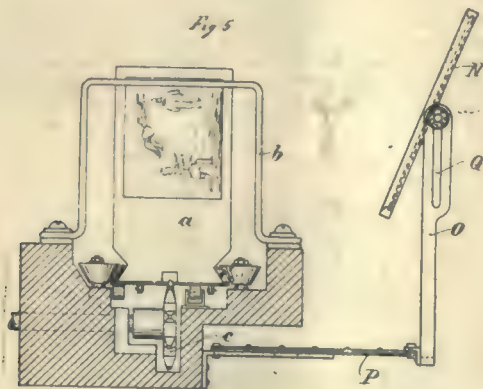
The means for illuminating the pictures as they are produced consist of a source of light, *n* (lamp, or the like), having arranged there-around a cylinder of polygonal cross section, as at *A*, the sides of which are of different coloured glass, or other translucent material. This cylinder, *A*, is mounted to rotate on the stand of the lamp, or other source of light,



and advantageously provided at the bottom with a gear, c, which engages an intermediate gear, v, suitably mounted on the supporting plate of the apparatus. The gear, v, engages a rack, z, mounted on the base plate

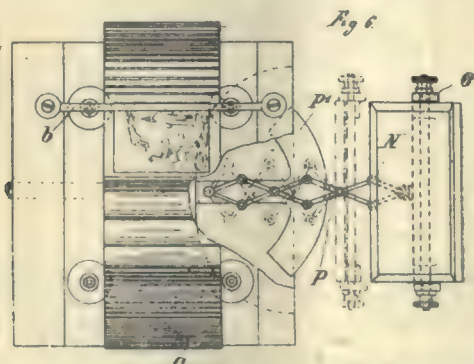


of the block of pictures, and obviously, as the block is moved forward as previously mentioned, the rack, z, will rotate the gear, v, and with it the gear, c, and translucent mantle, a, of the lamp. Thus the pictures,



as they are produced, will be illuminated with a light which constantly changes its colour, and a very pretty effect will be attained.

Instead of a mantle, a, enclosing the source of light, b, a disc, r, may be employed as shown at figs. 3 and 4, the said disc being mounted in



front of an electric or other light, and between it and the effective surface of the pictures. This disc may be provided with various colours, and must, of course, be translucent. The disc may be rotated from the

driving shaft of the star wheel, c, by means of a cord or chain, r, and wheels, n and k.

In figs. 5 and 6 a device is shown for reflecting light on to the picture as it is produced. This device consists of a reflector, x, pivotally mounted in slots, q, of a supporting frame, o, which is mounted on an expansible set of levers, p, known as "Nuremberger scissors." This set of levers is also adapted to turn on its pivot on a segment, r, fitted to the base plate of the apparatus, as will be evident from fig. 6, so that the reflector may be adjusted to any desired position as regards the picture.

### A THIRD EYE.

"Did man once possess a third eye?" is a subject that is just now going the round of the newspapers. One of them assures us that deep researches as to the structure of the human body have recently furnished some startling facts regarding changes which man is at present undergoing physically.

"It is believed that man was formerly endowed with more teeth than he possesses now. Abundant evidence exists that, ages and ages ago, human teeth were used as weapons of defence. Unintentionally, traces of such use are often revealed by a sneer. The teeth are sometimes bared, doglike, ready, as it were, for action.

"The practice of eating our food cooked and the disuse of teeth as weapons are said to be responsible for the degeneration that is going on. The wisdom teeth, in fact, are disappearing. Human jaws, found in reputed Palaeolithic deposits, have wisdom teeth with crowns as large as, if not larger than, the remaining molars.

"In ancient times a short-sighted soldier or hunter was almost an impossibility; to-day a whole nation is afflicted with defective vision. It is almost certain that man once possessed a third eye, by means of which he was enabled to see above his head. The human eyes formerly regarded the world from two sides of the head. They are even now gradually shifting to a more forward position."

As a specimen of amusing speculation, this sort of thing perhaps has merits, but there is absolutely no evidence forthcoming that the human race was once endowed with a third eye. Its uses are not obvious.

### WINDOW PICTURES.

[From the Catalogue of the Croydon Camera Club's Exhibition.]

Our Exhibition has perhaps nothing which will give more general pleasure to the majority of its visitors than the display of transparencies, or, as they are sometimes rather pedantically called, diapositives, with which Mr. Henry Stevens has favoured us.

Writing more for the casual visitors, be they amateurs or not, rather than for the old hands, let me explain that Mr. Stevens is anything but an unrecognised novice. Quite the contrary, he has received the distinction of being invited to hold a *One-man Exhibition* at the London Camera Club, when nearly a hundred of his transparencies formed the chief centre of attraction. Since then a selection was, by special request, shown, and greatly admired at the Imperial Institute. In fact, these transparencies have everywhere always evoked warm expressions of delight and appreciation, except, alas! at the leading Society's Exhibition, that of the R.P.S., where, at least on one occasion, these exquisite examples of one of photography's most inimitable and charming characteristics were displayed in such a way that the visitors who wanted to see them had to crawl on all-fours. This year Mr. Stevens does not exhibit at the Royal. Perhaps it is for similar reasons that there are this year at the same exhibition such a beggarly array of lantern slides.

### HOW TO MAKE WINDOW PICTURES.

Those who have seen our collection will all of them naturally long to possess similar photographic products, and such of them as are amateurs will like to know whether there exists any great difficulty to contend with before obtaining such results as Mr. Stevens has achieved.

In a word, there is no trouble or difficulty whatever, more than is met with in making bromide prints or lantern slides, except that one *must*, in order to get such results as are exhibited, start with a technically well-made negative. A negative which is quite good enough for producing an art result when printed through a dish cloth won't do at all for transparency work.

The negative should be perfectly sharp at the centre of pictorial interest, and, and not much "unsharp" anywhere else. Such gross out-of-focussing as produces blobs of light, instead of definite form, is out of the question. Staining, halation, and lack of gradation are all to be carefully avoided. Although the negative should be preferably of average density, an excessive density is no bar to the obtention of a good transparency, as is illustrated by Mr. Stevens' picture of *The Hyacinthus candicans*, the negative of which was so dense that the exposure of the transparency plate in full sunlight was twenty minutes.

One consideration which, no doubt, stands in the way of the average amateur is that the original negative needs, in order that fairly large transparencies be made, to be of considerable dimensions. This means



trouble and expense. Although any enlargement is apt to impair the brilliant definition which forms a strong attraction with a transparency, it is quite possible to obtain very satisfactory results by enlarging up to two diameters. Thus a whole-plate negative will yield an excellent 12×8 transparency. That this may result it will be useful to use a lens of full covering power, well corrected for astigmatism, and well stopped down.

As regards further technical data, for which the writer is indebted to Mr. Stevens, the best developer is amidol, not but what pyro ammonia will very well serve. In using amidol, the main risk is in over-exposure and under-development. Potassium bromide, used as a restrainer, is apt to spoil the colour of the image. A certain amount of over-development is called for with amidol, as the image goes back in the hypo.

Although any good transparency plate, such as Thomas's or Cadett's, may be used, Mr. Stevens has produced most of his exhibits upon Mawson & Swan's plates.

Those who are further interested in Mr. Stevens and his work in transparency-making will find an article by me in the August number of the *Camera Obscura* dealing more fully with the subject.

Before closing these notes, attention is drawn to the picture called *Worn Out*, as being the one which received the first prize of fifty guineas in the *Graphic* competition.

#### PLATINOTYPE TRANSPARENCIES.

Those who take fuller interest in the subject of window decoration by means of photography are reminded that the application of *platinotype* prints to glass results in very satisfactory transparencies. Visitors who require more information on this point are referred to Mr. W. H. Smith, who will attend the Exhibition every evening (except Monday, the 22nd) on behalf of the Platinotype Company.

HECTOR MACLEAN.

#### MONTHLY LANTERN MEETINGS AT THE R.P.S.

The Assistant Secretary of the Royal Photographic Society writes:—

"I have much pleasure in informing you that the Council have decided to institute a monthly meeting specially devoted to illustrated lantern lectures. These meetings will take place on the first Tuesday in each month, from November to April inclusive, and will commence at eight o'clock p.m.

"The first lecture of the series will take place on Tuesday, November 7, at the Gallery, 5a Pall Mall, East, when Mr. J. J. Vezey will give a lecture upon 'Some Mediaeval Towns of Germany,' illustrated by lantern slides by Commander C. E. Gladstone, R.N.

"The Council wish it to be understood that lady visitors are specially welcome on these occasions, and tickets may be had on application to me."

## Our Editorial Table.

#### SPECIMENS OF DEVELOPED GELATINO-CHLORIDE PRINTS.

J. P. Mayall, Limited, 10, Rye Hill-park, Peckham Rye, S.E.

SINCE we first referred to the photographs on gelatino-chloride paper produced by a system of development and toning which Messrs. Mayall have worked out, opportunity has been given us of examining a very large number of prints of great dimensions that have recently been made for commercial purposes. This inspection confirms us in the opinion we originally expressed on the subject. Messrs. Mayall appear to be extremely successful in obtaining uniformity and depth of tone in large numbers of gelatino-chloride prints, and we are not surprised to hear that many good judges amongst professional men have favourably criticised Messrs. Mayall's work. Certainly a process for developing gelatino-chloride prints which yields certainty and uniformity of results over a large number has a very great deal to recommend it, and Messrs. Mayall should receive considerable patronage in their attempts to popularise their process amongst photographers.

#### CATALOGUES RECEIVED.

W. Butcher & Sons, Blackheath, S.E.

At this season of the year, when the attention of so many photographers is concentrated on optical projection work, the catalogue of lantern accessories and slides which Messrs. Butcher are issuing should be found of great service for reference. It extends to about 260 pages and between its two covers gives particulars of all the apparatus a lanternist is likely to require. The slide section occupies over fifty pages. We advise all lanternists to procure a copy of this catalogue.

J. E. Johnson & Co., Rostellan Screen Plate Works, Gnthlaxton street, Leicester.

In this handsomely produced catalogue Messrs. Johnson give particulars of the screens for half-tone work which they prepare, and they include many beautiful reproductions of photographs made by screens the lineatures of which range from 100 to 250 lines to the inch. We advise all interested in half-tone work to procure this list. It may be remembered that Messrs. Johnson were awarded a medal at the Royal Photographic Society's Exhibition for one of their engraved screen plates.

## News and Notes.

PHOTOGRAPHIC CLUB.—October 25, at eight o'clock, Travellers' Night. "To Trieste and Back by Cycle," by C. Dalgarno.

MESSRS. BENDER & Co., of 242, London-road, Croydon, have been awarded the first prize at the German Convention in Baden-Baden for carbon and bromide enlargements.

THE AUSTIN-EDWARDS MONTHLY FILM NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Mr. J. B. Smith, 38, Albion-street, Brooks's Bar, Manchester, for his negative, *Study of Two Swans*.

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, Tuesday, October 24, at 5a, Pall Mall East, at eight p.m. Mr. Harry Wade will read a paper upon the "Wellington Film." The following lantern fixtures are arranged for the Pall Mall Exhibition:—Monday, October 23, "North Country Life and Scenery," by Mr. E. G. Lee; Wednesday, October 25, "Olla Podrida," by Mr. Tom Bright; Saturday, October 28, "Lowestoft and Neighbourhood," by Mr. H. Vivian Hyde.

THE NEW WELLINGTON film was the subject of an interesting description by Mr. Harry Wade at the Borough Polytechnic Photographic Society on October 11. The various operations of exposing, developing, and finishing were most clearly demonstrated, and, from the discussion which followed, the new film must seem to possess many advantages over the familiar glass plate, and more particularly for the purpose of enlarged negatives. On Wednesday, October 25, Mr. John A. Hodges, F.R.P.S., is to give a lecture on the "Pictorial Treatment of Lantern Slides," and the Society extends an open invitation to all who are interested. The meeting commences at 8.30 p.m.

"AS OTHERS SEE US."—The July issue of THE BRITISH JOURNAL OF PHOTOGRAPHY, in a supplement, gives a group of the attendants of the Fourteenth Annual Convention of Photographers of the United Kingdom. A finer-looking gathering is seldom seen of any profession. They range from young men scarcely above their teens to venerable men, whose heads are whitened with age, and a sprinkling of ladies. In that group is concentrated the photographic wisdom of the kingdom. May long life, continued wisdom, and great power be allotted to each of them as they dispense their knowledge of and interest in the useful, beautiful, delicate, mystic art of photography.—*St. Louis and Canadian Photographer.*

THE HOVE Camera Club's Fourth Annual Exhibition will be held at the Town Hall, Hove, on Thursday, Friday, and Saturday, December 7, 8, and 9, 1899. The Judges are the Rev. F. C. Lambert and Messrs. E. E. Mainwaring and C. H. Burleigh. The following are the open classes:—A, Champion Class for pictures (any subject) which have previously gained an award. B, For pictures (any subject) which have not gained an award in open competition. C, Lantern slides (any subject), in sets of four. D, A set or sets of four pictures by exhibitors who have never gained an award in photography. In each of the above classes silver and bronze medals and certificates will be given. Class D, silver medal presented by Mrs. A. O. Jennings. Entry forms and further particulars can be obtained from the Hon. Secretary, Mr. C. Berrington-Stoner, 24, Holland-road, Hove.

MR. J. J. SADLER, of Horsforth, near Leeds, informs us that he has been appointed special agent for the new radial adjustable photographic printing frame by the sole proprietor and manufacturer, Mr. G. V. Yates, of Sheffield. Mr. Sadler points out that there is a growing demand for small photographs at a reasonable cost, and which can be produced by means of artificial light (gas or electric) in a very short space of time. The advantages of this frame are stated to be as follows: 1, Simplicity; 2, one can print twelve portraits on a half-plate sheet of paper (the new Victoria size); 3, the saving of seventy-five per cent in plates, as the size of a negative is a fourth of a quarter-plate; 4, the saving in retouching, as there is only one negative; 5, no new apparatus (camera or lens) required; 6, artificial light can be used, so that the work can be done at any time; 7, exposure about five seconds. Full instructions are sent with every frame.

THE Essex and Middlesex Cycling Union, which last year threw its annual Photographic Competition open to all comers, has this year gone in for further extension. It has joined hands with the Cripplegate Photographic Society, and together they will run the sixth annual competition on most liberal lines. No money prizes are offered as the policy of the two promoting bodies is to foster amateur competition. Twenty-five medals are put up for the nine classes, in addition to diplomas for exhibits of sufficient merit. The open amateur classes are: Portraiture and Figure Studies, three prizes, gold, gold centre, and silver medals; Land or Seascape, gold, gold centre, and silver; Cycling subjects (set of four), gold centre and silver; Hand-camera subjects (set of six), gold centre and silver; Beginners' Class, silver and bronze; and Lantern slides (set of six), gold centre and silver. The open Professional Class is for any subject, the prizes being gold, silver, and bronze medals. The pictures will be exhibited at a three days' Exhibition (December 5 to 7) at Cripplegate Institution, Golden-lane, London, E.C., and they will be held covered by insurance against fire and theft whilst in the possession of the management. Entries close November 13, and pictures have to be delivered by November 27. Two well-known Judges will be appointed. Entry forms and fuller particulars can be obtained on application to either of the Hon. Secretaries of the Competition, Mr. A. T. Ward, Cripplegate Institute, Golden-lane, E.C., or Mr. G. F. Sharp, Falford House, Sach-road, Upper Clapton, N.E.

JUDGMENT RESERVED.—At the Grimsby County Court, on Thursday, George H. Eustace, photographer, Cleethorpe-road, Grimsby, sued G. E. W. Woodall, 17, East Marsh-street, Grimsby, for 12. 5s. Mr. Tonge appeared for the plaintiff and Mr. Barker for defendant. Mr. Tonge said the action was for improperly refusing to accept the delivery of the goods ordered. On April 28 defendant went to plaintiff and wanted a photograph of his wedding group. The negative of that photograph was—



taken by plaintiff's predecessor in the business. Plaintiff looked up the negative, and told them it was not a very good negative, and he suggested defendant should have a bromide enlargement of the picture worked up by hand. This was agreed to. Mr. Barker (pointing to the goods handed in by him): "This is the photograph and this is the enlargement." Mr. Tonge: "That is all we have left." Plaintiff said that a part of the group had been left out according to instruction. Subsequent to the completion of the enlargement the goods had been refused. A better job could not be made of it from the particular negative he had. It was a bad one. It was a very thin negative. He told defendant that Mr. Barker: "You say on your business cards, 'Satisfaction guaranteed.' Do you consider you have given Mr. and Mrs. Woodall satisfaction?" Plaintiff: "A satisfactory job has been made from the negative." Defendant's wife was called, and stated that plaintiff had said that he could make a good job of it, but the enlargement did not give satisfaction. Her husband said it made him look blind in one eye. His Honour asked witness if she was satisfied with the enlargement of herself. Witness: "I don't know." His Honour said he was not satisfied that plaintiff had made a good job of this matter. He would look at the photograph, and give judgment at the next Court.

## Patent News.

THE following applications for Patents were made between October 2 and October 7, 1899:—

FINDER.—No. 19,709. "A Distance-finder for Photographers." Communicated by J. H. GLASSPOOL. C. SPENCER.

BAS-RELIEFS.—No. 19,817. "A New Method of obtaining Bas-relief Photographs, Photogravures, or any Print where an exact Duplicate is to be obtained." A. J. E. HILL and PHOTO, LIMITED.

COLOUR PHOTOGRAPHY.—No. 19,843. "Improvements in Colour Photography." L. A. GARCHY.

SWING BACK.—No. 20,012. "Improvement in Swing Back for Photographic Cameras." Complete specification. W. F. CARLTON and H. W. LOCKE.

PRINTING MACHINES.—No. 20,024. "Improvements in Photographic Printing Machines." H. LOESCHER.

PLATINOTYPE TIN.—No. 20,112. "An Improved Storage Tin or Platinotype Paper." C. H. PRICE.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
23.....	Bradford Photo. Society .....	Stratford-on-Avon. Harold Baker.
23.....	Kington-on-Thames .....	Orthochromatism. James Cadlett.
23.....	Oxford Camera Club .....	Photographing Objects in Motion. H. M. Underhill.
24.....	Birmingham Photo. Society ..	Photographic Mounts. P. T. Deakin.
24.....	Croydon Camera Club .....	W. T. Greatbatch, and B. Moore.
24.....	Hackney .....	Soiree and Prize Distribution.
24.....	Royal Photographic Society ..	Negative-making. Rev. F. C. Lambert.
25.....	Ashton-under-Lyne.....	Wellington Film. Harry Wade.
25.....	Photographic Club .....	Demonstration: Messrs. Wellington & Ward's Negative Films. Harry Wade.
25.....	West Surrey .....	To Trieste and Back by Cycle. C. Dalgarno.
25.....	Camera Club .....	Discussion on the Current Exhibitions.
26.....	London and Provincial .....	Illusions and Anomalies of Vision. Shelford Bidwell.
27.....	Bristol and West of England ...	Open Night.
27.....	Leeds Photo. Society .....	Demonstration: The Tella Hand Camera. W. E. Dunmore.—Lantern Evening: Society's Collection of Members' Slides.
27.....	West London.....	Demonstration: Enlarged Negatives. Percy Sheard.
		President's Annual Address and Members' Slides.

### ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 17,—Mr. Chapman Jones, F.I.C., F.C.S. (Vice-President), in the chair.

Mr. H. W. Bennett was in attendance, and prepared to read his paper on "Architectural Photography," but owing to the fact that the *Soiree* of the Photographic Salon was taking place, there were very few members present, and the Chairman therefore suggested that under the circumstances it would be unfair to ask Mr. Bennett to deliver his discourse to so small an audience. He accordingly took a vote as to the advisability of postponing the meeting, and the majority being of that opinion, the proceedings were adjourned.

### COMING EVENTS.

October 24, "The Wellington Film," by Mr. H. Wade. November 7, "Some Mediaeval Towns of Germany," by Mr. J. J. Vezey, with illustrations from photographs by Commander Gladstone, R.N. November 14, the Traill Taylor Memorial Lecture, "Teachings of the Daguerreotype," by Major-General Waterhouse, I.S.C. November 21, Mr. H. W. Bennett will read his paper on "Architectural Photography."

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 12,—Mr. R. Child Bayley in the chair.

Mr. W. D. WELFORD said he had received a print from the member who, at the last meeting, mentioned that a certain coloured print by the Vicol process had lost its colour in a very short time. The print upon which this complaint was based was handed round, and the alleged fading was very obvious, especially when the print was seen alongside a freshly made print. The want of permanence exhibited in the case shown was in respect of the colouring only, the photographic image being quite satisfactory.

Mr. A. L. Henderson, who was heartily welcomed on his return after his long absence through illness, showed a number of slides of views in and around Aix-les-Bains, which, with its lake, mountains, and scattered houses and villas, offers considerable opportunities to the photographer. Many of the pictures were typical of the place as showing the sulphur, medicated, and hot-air baths and massage establishments for which Aix is noted, and there were several views of the interiors of these buildings.

Mr. T. E. Freshwater contributed some fine yachting pictures by the well-known firm of West & Son, of Southsea. They were especially interesting as including a view of this year's challenger for the American Cup, *Shamrock*, and other notable prize-winners, *Rainbow*, *Satanita*, *Narahoo*, &c. He also showed some slides of Dover and Norwich, and others of a miscellaneous nature were exhibited by Mr. Jarvis and Mr. Emery.

### PHOTOGRAPHIC CLUB.

OCTOBER 11,—Mr. J. R. Williams in the chair.

The Chairman showed one of McKellen's Phoenix hand cameras, the distinctive feature of which is the focussing arrangement, which allows of focussing upon a full-sized screen with one lens only. To this end a mirror is placed before the plate at an angle of 45°, the image appearing upon a screen placed at the top of the camera. By pressing a button the shutter is released, the same movement lifting the mirror up out of the path of the rays of light.

Some discussion took place upon the question of dusting plates, and it turned out that all the practical photographers present found it safer never to dust a plate, especially those of large size. This, being contrary to the preachings of the recognised text-books, seemed very regrettable. It was pointed out that a brush was, moreover, a most dangerous instrument for the purpose and that, if dusting be thought advisable, a pad of some sort should be preferably used.

Mr. WALTER D. WELFORD mentioned the enormous latitude in exposure which ortol allowed. As an instance, he cited the case of a cloud negative which had been about ninety times over-exposed, but which, developed in an old ortol solution, was saved from a bad end. It differed in no way from a correctly exposed plate upon the same subject, developed in the same developer. Mr. Welford said he had given up pyro entirely, and, from the discussion that ensued, it transpired that pyro was fast going out of use. *Requiescat in pace.*

**Camera Club.**—Last week the Camera Club settled down to serious business, and most of the well-known faces were to be seen there. Upon the walls of the large room are now hung a series of pictures by Mr. Ashton, who is the photographer, *par excellence*, of Eastern scenes. Year after year has he contributed to one or other of the exhibitions pictures of Eastern life, such as the interior of a barber's shop in Algiers, or a gossip in a café at Constantinople. One of the best of the present Salon pictures is from his camera, and now, at the Club, he has an Exhibition all to himself. The photographs are not many in number, but their quality is very high. On Monday there was a little disappointment in store for the members. The versatile Dr. Lindsay Johnson had been announced to discourse upon, and demonstrate, a new form of phonograph, but at the last moment the giddy thing refused to speak, and it had to be kept at home like a naughty child. But the members had by no means a blank evening, for Mr. Middleton was prevailed upon, almost at an hour's notice, to give one of his charming extempore lectures upon architecture. It is given to few to be ready at such short notice with a good lecture and a superb set of pictures with which to illustrate it, but Mr. Middleton is one of the few, and his valuable services are always at the disposal of his friends at the Club. Continental Gothic architecture is a very wide subject indeed, and Mr. Middleton made it wider still, by tracing its origin, and showed us how the early pilgrims, who wandered East before the time of the Crusaders, brought back with them impressions of the architectural features which they had seen in the far East; how these new forms gradually penetrated through the valley of the Rhine, and influenced the builders of all the noble churches to be found there. Then Mr. Middleton took his audience through Northern France, through Normandy and Brittany, and thence to Belgium and Germany, pointing out little differences in the treatment of stonework or ironwork which ordinary observers would pass by without notice. And not only was the lecture illustrated by an excellent series of pictures, but by admirable sketches of details which were hung around the room for after-examination. Mr. Middleton had an appreciative audience, and was thanked by all for his excellent lecture as well as for his kindness in giving it at such short notice. Wednesday was a Ladies' Night, when, of course, all technicalities were laid aside, and music, lantern slides, the phonograph, and suchlike frivolities held sway.

**North Middlesex Photographic Society.**—October 9, Mr. R. Child Bayley in the chair.—Mr. ERNEST MARRIAGE gave a lantern lecture on

### TELE-PHOTOGRAPHY.

The lens, the lecturer said, he used, was of a portrait type, working at  $f/3$ , with a negative attachment, which allowed of instantaneous work, many examples being shown. The rule for finding the magnification obtained by the combination was to divide the distance from the negative lens to the focussing screen by the focus of negative lens, and add one. The  $f$  value is found by multiplying the aperture by the magnification, and the equivalent focus by



multiplying the focal length of the positive lens by the magnification. He compared the results of taking a photograph with a short-focus lens and that taken with a tele-photo lens to the same size, the negative being much truer. The same result would be obtained by photographing with a single lens of the calculated focus of the tele-photo lens, but the rapidity was greater, as it did not require so much stopping down, and the extension of the camera would be much less. Mr. S. H. FRX, at the conclusion of the lecture, asked how the definition compared with an enlargement from a small negative to the same scale. Mr. MARRIAGE said theoretically the definition with a tele-photo should be as good as with an ordinary lens, and that practically the balance was very much in favour of the tele-photo lens. Mr. H. W. BENNETT thought the perspective shown in one or two slides was rather too slight to be altogether pleasing, which was admitted by the lecturer. Mr. MUMMEY said that it was perhaps because photographers were not accustomed to the perspective given by moderate lenses.

**West London Photographic Society.**—The Annual Meeting was held on the 13th inst., Mr. H. Selby (President) in the chair, and the Secretary's and Treasurer's report recorded a satisfactory year's working. The election of officers resulted as follows:—*President:* Mr. A. C. Beard. *Vice-Presidents:* Messrs. W. Collett, C. Dixon, A. Ebbs, and R. Horton. *Council:* Messrs. F. L. J. Barrow, G. F. Blackmore, M. W. Cockerell, G. Lamley, E. T. Lester, H. R. Proctor, L. Selby, and W. Taylor. *Hon. Treasurer:* Mr. A. E. Cockerell. *Hon. Secretary:* Mr. J. Brown, 28, Welte-road, Ravenscourt Park, W.

**Woolwich Photographic Society.**—The Seventh Annual Meeting took place on the 12th inst. The Society has had a most successful year. The balance in hand is 5*l.* 18*s.*, mostly profit from the 1899 Exhibition, at which no awards were offered. This enables the Society to become possessed of its own optical lantern, after paying off the syndicate of members who purchased the lantern, making some 9*l.* paid off during the present Hon. Secretary's term of office. Mr. W. H. Dawson was re-elected President, and Mr. F. W. Machen, 161, Griffin-road, Plumstead, Hon. Secretary. Next meeting on October 26. The Exhibition will be held on February 21, 22, 23, and 24, 1900.

**Liverpool Amateur Photographic Association.**—A demonstration was given on Thursday, October 12, by Mr. F. ANYON, who took as his subject

#### ENLARGING AND REDUCING BY ARTIFICIAL LIGHT.

With the aid of a diagram of the Club's new lantern, Mr. Anyon explained, in the most lucid manner, the management of the various parts in order to obtain the maximum of light. Dealing with the various methods of keeping the bromide paper flat during exposure, the lecturer advocated the wetting of the paper as giving the best results, and, in the matter of development, the use of amidol, which, in his hands, was everything to be desired. Mr. Anyon exposed a piece of bromide paper by means of the enlarging lantern, and the resulting print, on being passed round, was very much admired. At a subsequent stage Mr. Anyon showed the members how to reduce an over-exposed bromide print by means of a solution of iodine. The over-exposed print was first immersed in the iodine solution for a few minutes, and afterwards transferred to a solution of hyposulphite of soda, when it was found that, instead of a dark fogged print, the lecturer turned out a perfectly clear and beautifully graduated picture.

**Rochdale Photographic Society.**—The Annual Meeting of the Rochdale and District Photographic Society was held last week at the Temperance Club, St. Mary's Gate. Mr. G. Smith presided. In opening the meeting, the CHAIRMAN referred to the loss which the Society had suffered by the death of Mr. H. Bamford, their late Secretary. No one deserved more credit for the present sound position of that Society, and his place would be difficult to fill. The Secretary's report showed that the past year was the best the Society had experienced since its formation, though the rambles had not been so well attended as might have been desired. During the year the Society had purchased an enlarging lantern. This had been largely used by the members, and the work done by means of it was of a very creditable kind. There was a loss of 1*l.* 1*s.* 5*d.* on the Exhibition which the Society promoted recently; otherwise it proved highly successful. The financial statement showed a balance gain of 3*l.* 1*s.* 10*d.* on the last season's working. The following officers were re-elected:—*President:* Mr. J. A. Bright. *Vice-Presidents:* Colonel C. M. Roysds, M.P., Alderman J. B. Heape, J.P., the Rev. T. P. Spedding, Dr. W. Mills, and Messrs. R. M. Jones, C. Fairbank, and W. Ingham. *Committee:* Messrs. J. Grindrod, J. S. Johnson, R. Turner, F. Ashworth, J. Morrison, G. Smith, E. E. Ashworth, J. H. Whiteley, and T. Kerahaw. *Lanternists:* Messrs. W. Bray, E. Willman, J. Grindrod, and E. H. Seanor. *Treasurer:* Mr. W. Bamford. *Secretary:* Mr. E. H. Seanor. *Assistant-Secretary:* Mr. R. Whitehead. It was decided to hold another Exhibition this season, and the arrangements were left in the hands of the Committee.

#### FORTHCOMING EXHIBITIONS.

1899.

- October 20-24 ..... Croydon Camera Club. Hon. Secretary, W. H. Rogers, 106, Holmesdale-road, South Norwood.  
 „ 20-Nov. 4 ... Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.  
 „ 20-Nov. 11... Royal Photographic Society. Hon. Secretary, Major-General Waterhouse, 66, Russell-square, W.C.  
 „ 22-Nov. 19... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.  
 November 15-17 ..... Hackney Photographic Society. W. Selfe, 70, Paragon-road, Hackney, N.E.

November 20-25 ..... Longton and District Photographic Society. Thomas Mottershead, 43, Stafford-street, Longton, Staffordshire.

„ 27-Dec. 18 American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.

December 7-9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.

„ 11-Jan. 1900 Huddersfield (Invitation). W. A. Beevers, Cloth Hall-street, Huddersfield.

„ 27-30 ..... Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.

1900.

April 3-7 ..... Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Correspondence.

\* \* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### THE ECLIPSE PHOTOGRAPHS AT THE ROYAL PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—Since writing you the letter which you have done me the honour of publishing in your issue of last week, I have seen a photograph of the sun passing behind a church spire, which leads me to think that the eclipse photograph on which I commented is possibly the result of a partial reversion. There are some things about it, however, which appear to me doubtful, but which could possibly meet their explanation if the original negatives were available for examination.

As the matter stands, the picture is an entire misrepresentation of the most essential part of the phenomena it purports to represent; it is one of those half truths which are far more difficult to deal with than an entire falsehood.—I am, yours, &c., J. F. TENNANT, Lieut.-General R.E.

11, Clifton-gardens, Maida Hill, W.

#### DRY MOUNTING.

To the EDITORS.

GENTLEMEN,—I am obliged for your reply to my query through Correspondence column of THE BRITISH JOURNAL OF PHOTOGRAPHY to-day's date, but regret you do not mention how to dry mounts. I think the prints probably have a mountant brushed over them while still on the ground glass, and when dry they will be removed from the glass, then moistened in some way, or perhaps the mounts are damped and then passed between rollers under pressure; what I would like to know is: (1) Usual method employed; (2) Constituents of mountant (starch alone is not sufficient); (3) Is there a roller mounting machine specially made for this work?

I think I have seen articles on dry mounting in the JOURNAL; could you oblige me with date without much inconvenience? I have taken the JOURNAL for about eight years, so no use going further back than 1890.—I am, yours, &c., G. FRANK.

Studio, 81, West-street, Gateshead, October 13, 1899.

[The method of dry mounting is given in a leading article in another column, but we should have thought that what we recommended last week would for this purpose, have been better than dry mounting. Any ordinary rolling press answers. None is made specially for the purpose.—ED.]

#### LANTERN SLIDES ON EXPOSURE.

To the EDITORS.

GENTLEMEN,—I am often asked by secretaries of photographic societies to read a paper on exposure or some kindred subject. My engagements do not permit me to spend much time on this work, and I have therefore prepared a new type-written paper, fully illustrated with lantern slides on exposure. This I shall be happy to send to secretaries as far as dates fit in, and Messrs. Field have provided examples of meters to accompany.—I am, yours, &c., ALFRED WATKINS.

Imperial Mills, Hereford, October 14, 1899.



## PORTRAITURE BY ARTIFICIAL LIGHT.

To the Editors.

GENTLEMEN,—You may recollect some time ago we asked your opinion in reference to a new principle of electric lighting, and, as you thought our idea patentable, we at once took out provisional protection, and are meantime engaged on the complete specification.

Your opinion, in the form of a critique of photographs we herewith submit to you, would be esteemed and be of value to us. They were all taken in the same evening, and the exposure for those of the children was a quarter of a second. There was no particular attempt at arrangement, as it was intended as really a test for our new method or application of the electric light.—We are, yours, &c., G. & W. MORGAN.

398, Union-street, Aberdeen, October 16, 1899.

[If we except here and there a slight heaviness of shadow, the specimens submitted to us are faultless. The lighting is soft and harmonious, the modelling excellent, and, on the whole, the work is of a high order of merit. An electric light allowing of an exposure so short as a quarter of a second, and yielding such results as those before us, is a distinct acquisition.—EDS.]

## PROFESSIONAL PHOTOGRAPHERS AND DEALERS' TERMS.

To the Editors.

GENTLEMEN,—In your reply to "Upperton," in your issue of October 6 you repeat what you have on several occasions informed similar inquirers "that, in order to secure dealers' terms, they must relinquish professional photography, and trade as dealers 'pure and simple.'"

I think a very fair question for your correspondent to ask would be, "How many dealers 'pure and simple' there are in business at the present time?"

Do not by far the greater proportion of them make a speciality of developing plates and films for their customers? No one can possibly blame them for this, for a man must be particularly "pure" and more than usually "simple" to allow work for which he has the time and capacity to pass his door.

At the same time, if manufacturers are to establish a rule of cast-iron inflexibility, which says to a professional photographer, "We cannot allow you a trade discount on films to reload the spools you develop for customers, or material of other kinds to sell to them, unless you relinquish this professional part of the business," why does not the same rule apply to a chemist, and refuse him trade terms so long as he receives payment for photographic work of a professional nature?

If a dealer may do "professional photography," why may not a professional photographer do "dealing?"

I firmly believe that in nine cases out of ten a photographer can employ his time better in developing the resources of his business than in selling packets of P.O.P.; but, if there is to be a strict line of separation drawn between the two businesses, a man ought not to be allowed to sit on the fence, but should be made to declare himself on one side or the other.—I am, yours, &c., W. T.

Newcastle-on-Tyne, October 12, 1899.

## MR. BLAND'S SUNBEAMS.

To the Editors.

GENTLEMEN,—Although it is now some years since the rotation of the earth was discovered, I am somewhat surprised that you and Mr. Bland have forgotten the fact. The amount of divergence of the beams shown in the photograph depends, of course, solely on the length of exposure.—I am, yours, &c., "SAMUEL."

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensues delay.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

## PHOTOGRAPH REGISTERED:—

W. J. J. Thompson, 2, Worcester-street, Kidderminster.—Photograph of old gates of St. Mary's and All Saints' Church, Kidderminster.

RECEIVED.—J. L. HODGSON. In our next.

COLLODION EMULSION.—T. RICKFORD says: "I shall feel greatly obliged if you can inform me what I require to prepare and mix a solution for the above used by photographers who photograph direct on the wood for engravers?"—Use the formula No. 1 for washed emulsion as given on page 1058 of the ALMANAC.

DENTED LENS MOUNT.—Y. L. As it is the cell in which the lens is burnished that is damaged by the fall, we should advise you to put it into the hands of a practical optician. If you attempt to do the needful yourself, you will probably crack the glasses.

ADDRESS WANTED.—T. PETERSON writes: "Will you kindly give me the address of the manufacturers, or the wholesale dealers, of the Leviathan Concentrated Colours?"—In reply: The manufacturers are, we believe, Messrs. Levi, Jones, & Co., Hoxton-square, N.

GRANULARITY IN ENLARGEMENT.—T. COHEN. The granularity in the enlargement is not in any way due to the paper upon which it is made, but to the original negative. The grain in that is apparently exceedingly coarse, and, as the enlargement is great— $1\frac{1}{2} \times 1\frac{1}{2}$  inches to  $12 \times 12$ —the coarseness is very conspicuous in the result.

RESTORING DAGUERRETYPES.—H. HALL says: "Would you kindly, through your valuable paper, tell me whether it is possible to restore a Daguerreotype the figures of which have all but faded away?"—The picture can be cleaned with a solution of cyanide of potassium; but, as our correspondent is evidently not familiar with the Daguerreotype process, he had better not attempt the work himself, but intrust it to some one who is. Many valuable Daguerreotypes have been quite ruined in inexperienced hands.

HYPONEGATIVES.—C. DRYCE says: "Herewith I send you a negative for your opinion as to the cause of its appearance. It, with others, was taken last year. Several, like the enclosed, have a scaley-like appearance. They were varnished with —'s varnish, but they have not all gone the same."—The trouble arises from the negatives not being properly washed before they were varnished, consequently the hypo has crystallised out. Apply the tongue to the "scales," and you will then have no doubt as to their composition.

STUDY OF LIGHT AND SHADE.—LIGHT AND SHADE asks: "1. Could you advise me as to the best plan an operator could go about so as to make a thorough study of light and shade? 2. Would you recommend attending classes where you are taught shading; would that be any help? and, also, 3. What books would you advise to study?"—1. Study the works of the best photographers, for example, the published portraits as seen in the shop windows, also the best works on photography. 2. Yes, certainly. 3. Inglis's work on posing and lighting, published by Dawbarn & Ward, Farringdon-avenue.

VALUE OF LENSES.—LENSES says: "I have in my possession a set of lenses similar to that mentioned in to-day's issue of your JOURNAL, p. 651, manufactured by R. & J. Beck, London. There are eight lenses, two 3 inches, two 4 inches, two 5 inches, and two 7 inches, with a brass diaphragm. As I wish to sell the set, would you kindly inform me in your Answers to Correspondents what it would be worth? It is in perfect condition, in case."—We should advise you to consult Messrs. Beck on the subject. We never undertake the valuation of apparatus. Probably, however, half the list price, whatever that may be.

A PATENT QUESTION.—FLASHLIGHT asks: "May I ask your valuable advice on the following? I have made an apparatus for catching the smoke generated on using flashlight powders; it is simple, extremely portable (taking up about as much room as two umbrellas when folded up), quickly adjusted, and quite effectual. Do you think it is of sufficient commercial value to warrant my completing a patent of some before putting on the market, or would you simply protect it and put on market at once? I should esteem it a great favour if you would advise me on the matter."—In reply: The best plan for our correspondent to pursue would be to provisionally protect his invention, and then submit it to some of the trade houses. He will then quickly discover its marketable value.

DAMAGED POSITIVE.—COUNTRY writes: "If you could kindly advise us about this picture, we should feel very much obliged. It has been sent to us for restoration, but all others that we have had like this had scratches at the back corresponding with the blurred spots, and it has only been a matter of black paint or velvet to put them right; but you will notice the coating at back of glass in this picture is not scratched. What, then, is the cause of the faded spots, and how can they be put right? As our customer values the picture highly, would it be safer for us to put it into the hands of one accustomed to the older processes, and could you favour us with the name and address of such?"—The picture has not faded; all that is the matter with it is, that the black varnish at the back has split from the glass. Remove the varnish, either by scraping or with benzole, and apply fresh. We should think you could do this yourselves. The picture has been returned to you.

A STUDIO QUESTION.—"BUSINESS" says: "I have erected a small studio in the garden of a house wherein I am a lodger, having the landlord's permission for the same. He himself helped me to build it. It has been there about eight months, and I have a very prosperous portrait trade in the town. It has just come to my knowledge that he has said that, in the event of his death (he is an old man), the house and studio would all be sold. Could you reassure me on the point, as I am very anxious, having laid out a good deal of cash upon it? The building is of wood, portable, bolted together in sections. It stands partly upon piles, partly upon bricks. I enclose a ground plan, that you may the better judge. These two piles are the only ones nailed to the floor of studio, all the other piles are quite disconnected. There is a little mortar between the bricks, but the studio is not joined to the bricks, it simply rests upon them."—As the studio appears to be a fixture, i.e., it is attached to the ground by being nailed to the piles which are in the ground, we suspect it will have to be sold with the house. However, it is a somewhat knotty point. Cannot you make some arrangement in the matter with the landlord while he lives? That would be your best plan.



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## EX CATHEDRA.

On Thursday in last week there was a meeting in London of the Council of the Photographic Convention of the United Kingdom. The President (Mr. Crooke) occupied the chair, and he was supported by a good attendance of members. The Honorary Secretary and Treasurer (Mr. Bridge) reported that the accounts of the Gloucester meeting had been made up, and showed a profit. The principal business of the meeting was the election of an Honorary Secretary and Treasurer for the ensuing year, and the choice of the Council unanimously fell upon Mr. Bridge, who was cordially thanked for his valuable services to the Convention in the past.

\* \* \*

How richly Mr. Bridge deserved the thanks of the Council may be understood from the fact that after the Glasgow meeting the amount of Convention money in hand was only *11. 8s. 4d.*, whereas now, after all the expenses of the Gloucester gathering have been met, no less a sum than *63*l.* 6s. 8d.* is in hand—a profit over sixty pounds in one year's working of the Convention. This result, and the business like management of

Mr. Bridge which brought it about, needs no eulogy from us: nevertheless, we cannot refrain from congratulating the Honorary Secretary and Treasurer on the fact that a most enjoyable meeting of the Convention was also a great financial success, and we are sure that all Conventioners who read these lines will join us in these congratulations.

\* \* \*

On the previous evening the presence in town of the Convention President gave several members the opportunity of entertaining him at dinner at the Restaurant Friscoatl. Mr. Crooke had for his fellow guest Mr. W. J. Croall, of Edinburgh, the very able amateur photographer of animals, and the healths of both gentlemen were very cordially toasted. In addition to the guests of the evening there were present Mr. Thomas Bedding, Mr. E. J. Humphery, Mr. C. J. Emery, Mr. H. Vivian Hyde, Mr. E. J. Wall, Mr. W. E. Dunmore, Mr. H. Walter Barnett, Mr. James A. Sinclair, Mr. Seary, &c.

\* \* \*

We have received the report of the Examinations Department of the City and Guilds of London Institute for the session 1898–99, and we append some extracts from the remarks of the Examiners in Photography, Mr. C. H. Bothamley and Mr. J. D. Geddes. The first-named gentleman says: "Comparatively few candidates showed any real knowledge of even the elementary properties of lenses; 'depth of focus' was frequently confused with spherical aberration, and distortion of the image with roundness of field. On the other hand, the uses of the swing back were remarkably well known by several candidates. The routine of mercurial intensification was well known, but many of the candidates seemed to be unacquainted with probable sources of failure. Most of the candidates showed little knowledge of albumenised paper, and the discussion of the relative merits of this and gelatino-chloride paper was not, as a rule, well done. It would seem that more attention ought to be given to the photographic behaviour of mixtures of potassium bichromate and organic substances, especially having regard to the fact that the processes based thereon are of great practical importance. The candidates in both grades (Honours and Ordinary) appear



to be unacquainted, as a rule, with the relations between the general properties or qualities of emulsions and the results that they are capable of yielding, and this is another point to which more attention might be given with advantage." We give prominence to Mr. Bothamley's strictures on the weak points shown by the candidates at the last examination, in the hope that they may be noted by those photographers who intend being candidates at the next examination, and also by those upon whom devolves the duty of teaching or instructing them.

\* \* \*

THE Judge of the photo-mechanical process work, Mr. Geddes, reported as follows: "The answers to the questions indicate generally an advance in the knowledge of technical details of the processes dealt with. It is also noticeable that most of the students make a particular study of two, or at most three, of the subjects included in the syllabus, indicating, as might be expected, an industrial demand for specialists in one or other of the sections of photo-mechanical engraving and printing." Coming from a man of Mr. Geddes' long practical experience, the hint conveyed in the last two lines of his brief report is especially valuable to those contemplating taking up a branch of photography as a profession.

\* \* \*

WE learn from our American exchanges that Secco film is on the point of being introduced to the United States, photographic public. The *American Amateur Photographer* has the following remarks on the subject: "If we take it for granted that the Secco film is all that is claimed for it, the natural question is, What are our American plate-makers going to do about it? That nothing shall be done is simply out of the question; and equally so is the idea that the hundreds of thousands of prospective consumers of the film can get it only at the enhanced price incident to importation under protection. Our plate-makers have hitherto done well both for and by us, and, as we believe in respecting their vested interests, we should be sorry to see them superseded by a syndicate, or any other form of organization, in the handling of what we feel convinced will be the photographic film of the future. Although they are perfectly able to take care of themselves, it can do no harm to suggest that they should take time by the forelock, and make such an arrangement as to render that impossible. Just what that arrangement had better be is not for us to say or even suggest, but it should be such as will best conserve the interest of both parties—the makers, in not excluding any of them from producing the films; and the consumers, in getting them at a reasonable price."

\* \* \*

Our contemporary, we think, is needlessly alarmed in this matter. Whatever measure of success may attend Secco or any other kind of film, glass plates are scarcely likely to be "superseded," as the *American Amateur* seems to imagine is probable. Away back in the early eighties films were introduced in this country for the purpose of "superseding" glass plates, but the latter are now made much more largely than ever. The whole fact is, that in photography there is a plate public and a film public, and in proportion to the skill with which manufacturers cater for these publics so will success attend plates and films. To talk of films superseding plates or, indeed, *vice versa*, may be a pardonable exaggeration in a

prospectus, but a little reflection will show that neither state of things is at all likely.

\* \* \*

THE *National Druggist* recently gave some information respecting the fire-extinguishing qualities of ammonia, which may be of interest to those of our readers who still employ that alkali in development. "In one instance, where fire had originated, probably from spontaneous combustion, in a pile containing several tons of cotton-seed, and the interior of which was almost a solid body of live coal, a half gallon of ammonia completely smothered the fire. In another, which occurred in Savenay, France, the vapours of a tank containing fifty gallons of gasoline caught fire in the linen room of a laundry. The room was instantly a mass of living flames, but a gallon and a half of ammonia water thrown into it completely and almost immediately extinguished the fire. The ammonia was in a glass demijohn in an apothecary's shop next door to the laundry, and was thrown into the room by the druggist as an experiment. To use his own words in reporting the circumstance, 'The effect was instantaneous, torrents of black smoke rolled upward in place of flames, and in a moment every trace of fire was gone. So completely was the fire extinguished, that workmen were enabled to enter the room almost immediately, where they found the iron tank of gasoline intact.'"

\* \* \*

ON the subject of "A Third Eye," to which we made reference last week, a friend is good enough to send us the following note: "The pineal body—a small, reddish-grey, vascular body situated behind the third ventricle—is believed to be a vestigial sense organ, probably of sight. A rudimentary median eye (the pineal eye) actually occurs in certain lizards."

#### MOSER'S IMAGES.

THE paper communicated by Major-General Waterhouse to the Dover Meeting of the British Association, which we published in our issue of October 13, has, no doubt, interested many more of our readers than those who have had the opportunity of inspecting the specimens exhibited by General Waterhouse at the Royal Photographic Society's Exhibition. Silver—metallic silver—seems at first sight such an unlikely substance to be susceptible of any photo-chemical change that we may call attention to the many curious experiments made by Ludwig Moser nearly sixty years ago, on the lines of which General Waterhouse's experiments were made, but in which, nevertheless, we are inclined to think no explanation is to be found for the print-out image now obtained in a silver plate.

Moser's papers appeared in Poggendorff's *Annalen* in 1842, but a translation of them is to be found in Taylor's *Scientific Memoirs* for 1843. They record many curious facts observed in that obscure borderland, which still exists, between chemistry and physics. As recorded experiments they are most interesting, even though the theory which is entwined round them is at times fantastic. The author tries hard to make his experiments prove that light acts on all bodies, producing certain changes, the like of which are also produced by contact with other bodies and by the condensation of vapours.

Moser found that, by rubbing and pressing many surfaces, a latent image was impressed which could be rendered visible by exposure of the surfaces to a vapour, such as the breath or the vapour of mercury. Any one can make an illustrative experi-



ment in two minutes by writing on the back of a negative with any hard substance (or even the finger), such as the handle of a toothbrush, and breathing on the glass. The impression of the writing becomes visible, although before exposure to the breath not the faintest sign can be discerned. The development of the image can be repeated again and again even after the lapse of a considerable time.

Moser ascribed these results to "latent light," but the true explanation of them was not given until some years later.

It has long been known that all substances retain a thin film of air on their surfaces with such tenacity that very forcible means must be taken to detach it. Strange as this may sound, it is, nevertheless, true, and in many delicate physical measurements this adherent air has to be taken into account, and frequently the apparatus must be heated to redness to completely dissipate it. Now, this film of air is removed when, say, a stylus is pressed on to any surface, the pressure on a small area rising in such cases to something very great, and the surface acts differently in receiving a film of moisture or mercury according as it is or is not covered with an air film.

The production of images produced when a coin is laid on a freshly polished metal plate, from which, therefore, the film of air has been removed, is somewhat differently explained. In this case the metallic surface, when brought into contact with the coin, partially removes the air film from the latter and thus forms a latent image. Moser describes an experiment of this kind thus: "An engraved metallic plate was warmed and then held for about half a minute on a well-polished piece of silver foil or a clean mirror plate. When the plates were cold, they were breathed on and exhibited the above-mentioned appearance in a much more perfect manner; for not only were the outlines of the body visible but also the individual letters, &c., and all with the greatest distinctness."

But there are other facts recorded by him of which the conventional theory does not offer any satisfactory explanation. Thus the following: "A new plate of silver was cleaned and polished as well as possible. A surface with various excised characters was suspended over it without touching, and the whole was exposed to the sun for some hours and directed towards it; after the plate, which, of course, did not exhibit the least change, had been allowed to cool, it was held over mercury heated to about 60° Reaumur (170° Fahr.). A clear image of the screen was produced; those parts where the sunlight (which had been very weak) had acted had caused the deposition of a quantity of mercury."

This last experiment brings us more into line with General Waterhouse's work, with the great difference that in his case a visible image is produced on exposure to light. This is still less capable of explanation on the physical "air film" theory, and we await with interest the progress of the experimental work which General Waterhouse is undertaking; the results, by disclosing the action of light under the simplest possible conditions, may perhaps illuminate the more complex question of the photo-decomposition of the silver haloids.

**Technical Education.**—A great deal has been written during the last few years with regard to the technical education that the German lads receive in their schools, and that the rapid strides made by that nation in the arts and manufactures is greatly due to this part of the education; also there have been many comments on the lack of that branch of learning in this country. Now, however, we are giving more attention to the matter, and are establishing a

number of technical schools somewhat after the manner of our German cousins. It is with pleasure that we learn that, through the generosity of one of its governors, the Felstead Schools are now in possession of new chemical and physical laboratories, which have just been added to the school buildings, and which were opened one day last week. The new building contains a chemical laboratory, with benches for nearly thirty boys. In addition to this there are physical and electrical laboratories, as well as a commodious lecture room. With these acquisitions the Felstead Schools should turn out boys with a good education in technical matters, and able to compare well with those hailing from Germany.

**War Maps.**—Nothing, perhaps, more forcibly illustrates the progress that electricity and photography have made during the past few years than the present war in the Transvaal. The news of the attack on Glencoe was received here within two or three hours of its being made, and, although Glencoe is something like 7000 miles away, the War Office here was kept posted up, every hour or two, as to how the battle was progressing. Not only were Londoners able to read the details of engagement the next morning at their breakfast table, but they were also able to follow the movements of the troops and the enemy by skeleton maps by which the accounts were accompanied. These maps were all reproduced by means of photography. The maps were drawn to scale and reproduced photographically and line blocks made, each map having a scale in English miles at its margin, so that the reader could the better realise the distances from place to place. These blocks are all made, and got ready for setting up with the type, at a few hours' notice. But for photography such a thing would have been an impossibility.

**A New Observatory at Lincoln.**—The Lincolnshire County Committee have been offered, and have accepted, a valuable set of astronomical instruments by the executors of the late Canon Cross of Appleby, who took a great interest in astronomy. It is proposed by a committee who are promoting the scheme to erect an observatory in the keep of the old Castle at Lincoln, and to raise funds for its erection, and maintenance, by public subscription, and then to ask the Lincolnshire County Committee to take over the property as well as the valuable instruments in trust for the County. There should be no difficulty in raising the necessary amount, which need not be large, in the county alone, but, no doubt, it will be supplemented from outside sources. This country is not, by any means, over-stocked with astronomical observatories, and every one, however small, is useful in increasing the interests of astronomy. It might be worth the consideration of the Committee in this affair as to whether the observatory should not, at times, be open to the public at a small charge. Many who take an interest in astronomy have not the means of purchasing large and costly telescopes, but would gladly pay a small fee for the opportunity of seeing some of the heavenly bodies through one; and the fees would go to help to defray the cost of the maintenance of the building, &c. At one time there were some very fair telescopes, with up to six-inch object-glasses, to be seen in the streets of London on clear evenings, and they were well patronised. But we have not met with any of that class during the last few years.

**Nelson's Column.**—Not a few photographers, who had made up their minds to photograph the column with its decorations, on Saturday last, were much disappointed through the weather. A thick fog enveloped the square all day. Still, hand cameras were to be seen at various times, and some few enthusiastic amateurs made snap-shots, but the results could well be imagined by those who saw the weather at the time. We are told that attempts were to have been made at night to photograph the column with its electric-light decorations, but, of course, that was also futile, as the lamps could not be seen at any distance from it through the dense London fog that prevailed at night as well as all through the day.



**Guildhall Pictures.**—A week or two back we mentioned that the Art Gallery, at the Guildhall, was to be further enriched by the picture by Mr. A. C. Gow, R.A., depicting the memorable gathering on the steps of St. Paul's on June 22, 1897, with the Queen seated in her state carriage, attended by the Prince of Wales and several others of the Royal Family. The picture, which was in the last Exhibition of the Royal Academy, is the gift of Mr. Henry Clarke, a member of the Common Council, who takes great interest in the City Art Collection. The painting was unveiled by the Lord Mayor, on Friday last, in the presence of several of the aldermen and other City functionaries. One noteworthy feature in the presentation was the handing to the Lord Mayor the papers relating to the copyright in the work. In doing so, Mr. Clarke expressed the hope that any money derived from copies of the picture would be devoted to the purchase of further works of art for the Gallery. In this instance the City hold the copyright in the painting, as well as the picture itself. It is not always that the copyright is disposed of with the picture. A good photogravure of this work, we should say, would command a ready sale.

**Decoration of St. Paul's Cathedral.**—A considerable amount of correspondence has appeared in the press during the past year or so on the "decorations" going on in St. Paul's Cathedral, and as to their suitability in Wren's grand masterpiece. At the meeting of the Court of Common Council last week a letter from the Dean was read, asking for further financial help in the decoration of the building. In his letter the Dean said his Committee had already raised and expended 150,000*l.* on the work, and another 50,000*l.* was required to complete the decorations, and he would be thankful if the Court would repeat their previous liberal gift. As might have been expected, after what has been said in art circles as to the character of the decorations, and how much they were out of keeping with Wren's object in his design, the subject brought forth some very adverse criticisms amongst the Councillors. One of the gentlemen expressed himself in these terms: "The decorations, so called, not only gave a gaudy appearance to the edifice, but disfigured the beautiful design of its great architect." The opinion here expressed quite echoes those which have been so generally expressed by the public, and architects particularly, who consider the gaudy colouring as attempting to paint the lily. The beauty of St. Paul's is its fine architecture. However, Wren's masterpiece is not the only fine edifice that has been disfigured by modern "decorations and improvements." Certainly, in this instance, they will not add to the beauty of future photographs of the interior of the Cathedral. The Court of Common Council have, however, not yet decided to give this extra 50,000*l.* Two hundred thousand pounds is a large sum to expend in what many consider destroying the chief beauty of a fine Cathedral—its architecture.

#### FOREIGN NEWS AND NOTES.

**Toning Bromides.**—The Belgian photographic paper, *Helios*, gives the following collection of formulæ for obtaining prints of various colours upon bromide paper. After development, fixing, and careful washing, bleach the prints in the following bath:—

Nitrate of lead .....	2 parts.
Potassium ferridcyanide .....	3 "
Water .....	25 "

As this bath also acts as a reducer, do not leave the prints too long in it, unless they are over-developed.

For brown tones wash the bleached print, and immerse it in the following bath until it assumes the desired colour:—

Schlippe's salt .....	2 parts.
Ammonia, '880 .....	1 part.
Water .....	30 parts.

For yellow tones use—

Neutral chlorate of potash .....	1 part.
Water .....	25 parts.

For green, take a yellow-toned print and immerse it in

Perechloride of iron .....	1 part.
Water .....	10 parts.

For red tones, immerse a yellow-toned print in

Chloride of copper .....	1 part.
Water .....	10 parts.

Bartolozzi red prints may be prepared by bleaching a well-washed bromide print in a dilute bath of bichromate of potash, acidified with hydrochloric acid, and then immersing it in a bath of

Schlippe's salt .....	1 part.
Water .....	25 parts.

When the right tone is secured, wash the print until every trace of yellow disappears from the white.

**Colour Screens.**—Baron von Hübl recommends the following screens for three-colour work in the *Photographische Rundschau*. The screens are prepared by staining a well-fixed and washed bromide plate, and they are used in contact with the sensitive plates selected for making the negatives. The colours for which the negatives are made are purple, greenish-blue, and yellow. The negative for the yellow is made upon an ordinary bromide plate without a screen, but, as an allowance in focussing has to be made for the thickness of the screens, a plain glass plate is placed in front of the ordinary plate exposed for the yellow. For the red, use a plate sensitive to yellowish-green, and stain the screen with—

Water .....	100 c.c.
Alcohol .....	40 "
Echtgrünbläulich (1:200) .....	12 "
Naphthol yellow, S. L. (1:200) .....	40 "
Glacial acetic acid .....	3 "

After the plate has been very deeply stained in the above, rinse it in distilled water to which a little acetic acid has been added, and dry it in a place free from dust.

For the blue, a red sensitive plate (dipped cyanine) must be used in conjunction with a screen prepared by immersion in the following bath:—

Water .....	100 c.c.
Alcohol .....	20 "
Biebricher Scharlach (1:200) .....	20 "
Methyl orange (1:200) .....	5 "
Naphthol yellow, S. L. (1:200) .....	5 "
Glacial acetic acid .....	3 "

Rinse and dry, as in the case of the green screen.

**The Paris Exhibition.**—We read in *Progrès Typo-Litho* that the following tenders have been made for the right to print, and sell the catalogue of the Exhibition:—Danel, 357,000 francs; Hachette, 452,500 francs; Lemerrier, 463,000 francs. The amount is to be paid in three instalments.

**Light and Toning Salts.**—The *Photographische Chronik* refers to the fact that weak solutions of potassium chloro-platinite, as used for toning silver prints, are unstable, and precipitate the metal as platinum black. The action of light upon platinite chloride reduces it gradually to platinic monochloride, and a very dilute solution of chloride of gold is also affected by light and deposits gold. But the writer thinks organic substances may play an important part in this case. Sulphocyanide of gold also decomposes and deposits a yellow substance of unknown chemical composition. As the solution was stored in a brown bottle, it is difficult to imagine what action light could have exerted upon it.

**Glass for Vacuum Tubes.**—In the *Archiv für Wissenschaftliche Photographie* we read that Dr. Schott has classified the various oxides and acids used in the manufacture of glass in the following order of capacity for transmission of X rays:  $Li_2CO_3$ ,  $B_2O_3$ ,  $Na_2CO_3$ ,  $MgO$ ,  $Al_2O_3$ ,  $SiO_2$ ,  $K_2CO_3$ ,  $CaO$ ,  $Mn_2O_3$ ,  $As_2O_3$ ,  $BaCO_3$ ,  $PbO$ . Taking this into consideration, as well as other essential properties, the new glass for manufacture of tubes is composed of sodium 10 per cent., boracic acid 30 per cent., alumina 20 per cent., arsenic acid 0.4 per cent., silicic acid 39.6 per cent. This glass has a much lower coefficient of expansion than platinum, and it therefore follows that, if straight, polished platinum wire is fused into it, a capillary space of annular section is formed in the process of cooling. This can be filled with a non-volatile oil by suction, and perfect vacuum is thus secured. Gundlach has made durable tubes in this manner, but it has been found that the relative position of the cathode and platinum foil have much more im-



portant influence than the difference of transmission of the old and the new glass. It is probable that the use of the new glass will, for this reason, be confined to the manufacture of vessels for the examination of substances by the Röntgen rays.

**The Gum-bichromate Process.**—In the *Photographische Chronik* it is suggested that coloured resins may be used with advantage to replace the ordinary dry colours and red acaroid, asphalt, turmeric, dragon's blood, guaiacum, &c., and the following formulæ are suggested:—

No. 1.	
Distilled water .....	100 parts.
Gum arabic .....	25 "
White candy sugar .....	2-3 "
Ammonium bichromate .....	5 "
Ammonia, sp. gr. '91 .....	5-3 "

No. 2.	
Resin, in powder .....	5-10 parts.
Absolute alcohol .....	15-20 "

For use, No. 1 is filtered and mixed with No. 2, which will be quite pasty, and then the mixture should be coated once or twice on well-sized drawing-paper. The first coating must be quite dry before the second is applied. Over-printed proofs should be developed with hot water. With a thin coating it is stated the results are more artistic, and with a thick coating the prints have more the appearance of ordinary carbon prints.

**The Reflection of Light.**—The *Deutsche Photographen Zeitung* publishes the following table of the amount of light reflected by the various surfaces and colours, the incident light being considered as unity, and the D spectral line being taken as the maximum visual luminosity:—

Black velvet .....	0.004
" cloth .....	0.012
" paper .....	0.045
Dark blue .....	0.065
Damp dark earth .....	0.079
Dark green .....	0.101
Bright red .....	0.162
The moon .....	0.170
Dark yellow .....	0.200
White stone .....	0.237
Bright blue .....	0.300
" yellow .....	0.400
" green .....	0.465
" orange .....	0.548
Photographic paper (white) .....	0.700
Snow .....	0.783
Mirrors .....	0.923

As the maximum sensitiveness of an ordinary plate lies about  $F \frac{1}{3}$  G, the colour of an object should be considered from this point of view. To obtain the same density for the various colours on an ordinary plate as that given by blue or white light, the following relative exposures must be given:—

Violet, about .....	2
Green " .....	4
Greenish-yellow, about .....	30
Yellow .....	36
Orange .....	120
Red .....	1600

#### PHOTO-SCULPTURE AND THE CINEMATOGRAPH.

THE *Photographisches Wochenblatt* announces a novel application of the cinematograph, and, if the results can be readily obtained equal in quality to the specimen of which our contemporary publishes a print, we may shortly see a new style of portraiture in fashion. A studio has been opened in Berlin for the production of photographic bas-reliefs by the Selke Photo-sculpture process. These portraits are not mere photographs stamped in relief, but consist of a series of silhouettes of successive planes in profile pasted over each other. The sitter is placed in front of a suitable background, and by means of a zonal mask and a series of arc lamps a shadow is cast upon the sitter from all sides. By advancing the shadow, and at the same time taking a series of forty to fifty silhouettes with the cinematograph, the requisite negatives may be taken in three to five seconds.

The first gives the entire profile. The second is rather smaller, owing to the advancing shadow. The last merely represents the most prominent parts of the figure, say the cheek bone, the hair over the temple, and the tip of the ear. These negatives are enlarged upon bromide paper to a suitable size, cut out and pasted one over the other. The edges are smoothed out with wax or some other plastic material, and a mould made from which any number of terra-cotta or plaster casts may be taken.

#### ACETYLENE FOR PHOTO-MICROGRAPHY.

DR. NEUBAUSS points out that, whilst limelight is the ideal artificial light for photo-micrography, its expense and trouble is against its general adoption. The arc lamp cannot be used because the point of light shifts so. The incandescent gas is used, but the image of the mantle itself is frequently troublesome. He therefore suggests that the acetylene cycle lamp should be used, and a lamp of this kind which gives a flame of about three-quarters of an inch high will give excellent results with exposures about half as long again as for the incandescent gas. One great advantage is that the flame is much smaller than the incandescent mantle. The reflector of the lamp should be removed; a plane reflector, preferably of white metal, should be used instead. It frequently happens that the generator gets hot. In cycling this is, of course, obviated by the cooling action of the air; for photo-micrography this trouble may be got over by placing the generator in a vessel of water.

#### NEGATIVE DODGING.

A few years ago photographers were contented with their negatives after everything that would improve them had been done by means of chemicals. Since then things have altered, and they have now learned to consider the negative as only a means to an end, and that end is to get as perfect a print from it as possible. To do this "dodging" is resorted to after all chemical means of improvement have been exhausted. By "dodging" is meant the use of certain tools, mentioned hereafter, in such a way that they obliterate or tone down objectionable parts, and introduce others that will improve.

Discretion, of course, must be used, as it can easily be overdone in the same way as retouching. By the way, retouching of portraits comes under the head of "dodging," but I do not propose to describe it, it being more or less familiar to every one.

The tools required are very simple and inexpensive, and need but little skill in their use. They are: one bottle of retouching medium, one ditto vaseline, tube of ivory black (oil colours), one ditto gamboge (water colour), three brushes—one camel's-hair (fine), one hog's-hair (medium), and a No. 1 sable—a packet of white tissue paper, some fine emery powder and paper, two retouching pencils (Nos. 3 and 4), a little black-lead powder (waste from retouching leads), one paper stump, a penknife with a very sharp point, and a retouching needle. The latter can be made at home by boring a small hole in a penholder, and fixing the eye portion of a fine needle tightly in it. The point may then be ground upon a stone to sharpen it. A retouching desk will be indispensable.

The negative must first of all be prepared by removing all grit from the glass slide, and neatly pasting a sheet of the tissue paper over, being careful not to have any creases or surplus of paste on it. The tissue paper must be of the finest quality, of an even transparency, and free from any mottling or flaws. Tracing paper may be used instead, providing it is not of a yellow colour.

If preferred, matt varnish can be applied in place of the tissue paper, but it will be found that the latter is the easiest to use. In applying the former, hold the negative in the left hand by the edges with the thumb and first finger, so that the glass side is upwards and in a horizontal position. Then take the bottle of varnish and pour a small pool in the middle, tilt till evenly distributed, taking care not to allow it to run over the edges on to the film side. Lay flat to dry, which will only take a few minutes. Slightly damp a piece of linen (free from lint) with the retouching medium, and gently rub with a circular motion all over the film side.

The retouching pencils are prepared by rubbing up to a very fine point on the emery paper. Save the lead dust, for it will be useful.

For an example of the method of "dodging" we will suppose we have a thin landscape negative, with weak detail in the shadows and faint clouds in a fairly dense sky. Having prepared the negative with tissue paper and medium, place it on the retouching desk with another piece of tissue over the film side, and then trace the outline of the horizon by means of one of the pencils. Remove the tissue and cut away the sky portion. It may then be pasted on top of the view portion of the negative, on the glass side, seeing that it registers exactly, so that there are two thicknesses over that part and only one over the sky.

Commence by brightening the detail in the shadows, on the film side with the retouching pencil No. 3. Hold it in the right hand in much the same way as a pen is held, only very lightly, and make small, fine strokes, laying them close up against each other, never allowing them to



overlap one another. If this does not make the detail sufficiently strong, go over it again, making the strokes in a different direction so that they cross the others in a similar manner to fine cross hatching. Too much pressure must not be put on the pencil or it will remove the medium and scratch the gelatine.

The high lights may now be brightened up. This is best done on the tissue-paper side. Squeeze a little of the gamboge out on to a clean glass, add some water, and well mix with the camel's-hair brush. Do not make it too thick. Its right consistency is when it is transparent. Load the brush with it (not too full, or it will run), and apply to the brightest high lights, such as whitewashed houses, the glitter on water, bright patches of roadway, &c., taking care that the colour does not go beyond the outline. Where the high lights are to be perfectly white, the colour must be used thicker, and, when they only require a slight brightening, it may be applied more thinly.

At this stage a rough print ought to be taken to see how the work is progressing.

It is surprising what beautiful results can be obtained by simply introducing a little atmosphere.

If it is desired, it may be made by putting a wash of gamboge over the portion of tissue that covers the distant parts of the view.

The clouds in the sky should now be improved to make them printable.

First deepen the density of their high lights by loading the paper stump with black lead, and rubbing it on the tissue directly over them. Turn the negative over, and reduce the shadow portions, to still further increase the contrasts. This is done by covering the rounded portion of a penholder with chamois leather, and dipping in the emery powder. It is then gently rubbed on the shadows from left to right, taking the precaution to see that the reduction is evenly done. Rubbing too hard will scratch the film and spoil it.

Harshness of contrast is another defect which is very prevalent in negatives, especially in those depicting interior scenes. In "dodging" these, they should be prepared in a similar manner to the above, with retouching medium and tissue paper. With the stump and black-lead powder go over all the deep shadows, putting an even coat of black on the tissue side, of course not working over the edge on to the high lights, or it will deepen the contrast instead of modifying it. If the contrast is very strong, a wash of gamboge can be used instead of the black lead. The detail in the shadows may be touched up with the pencil, but the high lights must be left severely alone. The contrast may still further be harmonised by dipping the hog's-hair brush in the vaseline and painting over the high lights on the tissue-paper side. This makes the paper transparent in those parts.

Dirty skies, that is, skies that print muddy or uneven, are another source of trouble to the photographer.

Practically the only method of improving these is to block them out. By blocking out is meant to so cover the sky up that it prints perfectly white. No doubt the best method is to paint it out by means of opaque paint. Squeeze a little of the ivory black out on to a piece of glass, and add a little turpentine to make it semi-liquid. Then take the fine sable brush, dip in it, and gently paint round the edge of the sky close up against the horizon. Having gone all along the outline, fill in the rest with the hog's-hair brush.

Every spot ought to be covered, so that it is perfectly opaque when viewed by transmitted light. The greatest care must be taken not to paint over the edge on to any portion of the view.

Some ladies are continually exercising their minds with the problem of how to reduce the size of their waist.

It may be done by means of photography; at least, it can be made to look smaller than it really is if the sitter is taken against a white background and a portion of the waist each side painted out. First of all, two lines must be drawn, one each end, by means of the pencil. They must be parallel to the outside of the waist. The amount to cut off will, of course, depend upon the size of the figure. If a cabinet, about one-twentieth of an inch each side will generally be found sufficient. The sable brush and black paint can then be taken and painted on the background and waist till it reaches the line. If skilfully done, detection will be impossible.

The beautiful effect of snow falling is very hard to render in a photograph by natural means, but it can easily be "dodged" in. Of course, the surroundings must be as natural as possible. For instance, it would be impossible to get it to look natural on a summer landscape. It matters little whether the "snow" is placed on the glass or film side of the negative. It is done with the small sable brush and black paint. The spots must be made small, not all of a uniform size, and should be placed irregularly over the negative.

Portraits, if brilliantly lighted, may be made to look exactly like statuary by cutting out the background of the negative so that it prints black.

Place it on the retouching desk and take the penknife, hold it upright, and gently but firmly cut round the edge. It must be done very gently, or the knife will cut over the edge. Having gone round the outline, hold the knife on a slant, so that the handle points over the right shoulder, then draw it along about one-sixteenth of an inch from the outline cut, and it will peel off the gelatine in strips. The whole of the background must be done in this way, first making an incision in the

film and then peeling. It is well to practise this on old negatives first before attempting on a valuable one, as the slightest slip may ruin it.

Sometimes the movement of a figure in the foreground will spoil an otherwise good negative. To obliterate this, use the retouching pencil on the light portions to make them of the same density as the surrounding parts, then take the retouching needle and lightly cross hatch over the dense parts till they are reduced to the same depth as the rest. If carefully done, close inspection will fail to reveal that there had been any figure there.

The needle will also be found a useful appliance for toning down high lights of too great a density, which are too small to be reduced by means of emery powder.

Portraits taken out of doors usually have objectionable backgrounds. These can so be "dodged" on the negative that they print lightly, throwing the figure into relief and giving very pleasing results.

The best method is to cover the back of the negative over with tissue paper, and paint all over the part covering the background with a wash of gamboge, of course taking care not to put any over the figure.

If you have a very thin landscape negative which gives a dark print, do not throw it away, but paint a spot on the glass side of its sky with ivory black, and have one or more zigzag strokes coming from it. This will give the effect of lightning, and makes a picture of an otherwise worthless negative.

Many other improvements can be effected with the above simple appliances.

OSBORN THORNBERT.

## THE OPTICAL LANTERN AS AN EDUCATIVE MEDIUM.

[Transactions of the Edinburgh Photographic Society.]

TO-NIGHT I purpose saying a few words to you upon the magic or optical lantern. It may be that at certain stages I shall prove rather technical in my expressions; should this be so, you will please bear with me. It will be my endeavour to make the evening as interesting as possible. As my time is limited, I need not go much into the details of history; suffice it to say that, according to some authorities, the optical lantern dates as far back as 1260 A.D., but more definite information dates from the middle of the seventeenth century.

Athanasius Kircher, a Jesuit priest, wrote a book entitled *The Great Art of Light and Shadow*, which was published at Rome in 1646. In this book was the illustration of a lantern, which I shall show you on the screen.

It was not until 1789, when Aimé Argand invented the now well-known "Argand" burner, that any distinct improvement was effected in the lantern, the drawback having been the lack of a strong enough source of light. During recent years improvements have made rapid strides. Owing to the demand by Educational Departments, a great impetus has been given to the quality, efficiency, and cheapness of these instruments. From a mere nursery toy the magic or optical lantern has become an indispensable piece of apparatus in the schoolroom and lecture-hall.

I shall now describe a lantern, explain the use of the different parts and the relation they bear one to the other, and then indicate some of the many uses to which it may be employed.

A lantern consists essentially of:—

- (1) A source of light or radiant.
- (2) A condenser to collect as much of the light as possible and illuminate the object or slide to be exhibited.
- (3) An objective or front lens to project the light on to the screen.
- (4) A box or body so arranged that the adjustment of one or all of the parts can be readily effected, and, when adjusted, to allow of them being clamped firmly in position. A further use of the box or body is to prevent rays of light from leaking into the lecture hall.

*Sources of Light or Radiants.*—These may be the different forms of oil lamps, incandescent gas-burners, acetylene-burners, etho-oxygen or oxy-hydrogen, or electric light.

The most popular are the paraffin oil lamp and the oxyhydrogen lime-light; these two we shall consider more fully to-night. The heavy oils, such as sperm, colza, and sweet oils, are now used mostly in toy lanterns, the form of lamp to burn these being cheaply made. The best form of paraffin oil lamp is one having three or four wicks, and which are placed edge on to the condenser. Each wick having a separate turner, a very good light can be obtained. The chimney is adjustable to height, and is thus able to compensate for any variation in the density of the oil.

The oxyhydrogen or oxy-coal gas lime light is the most popular of all lights. It is exceedingly brilliant in its effect, comparatively cheap to work, clean to use, and the various parts of the apparatus are rapidly put together.

Oxygen and hydrogen, or oxygen and coal gas, when mixed and ignited in a special burner, produce a flame having an intense heat, which in turn raises an incombustible substance to an incandescent condition. The incombustible substance mostly used at this time is a selected sample of Nottingham or Irish lime. The lime is turned into cylinders with a hole through the length to support it on a pin in front of the O+H flame.

The coal gas—because, generally speaking, coal gas, owing to its convenience, is used instead of pure hydrogen—is first of all ignited, and the



lime cylinder so placed that it very soon becomes well heated in the flame. The purpose of gently heating the lime at first is to drive off all the moisture, otherwise the piece of lime would split. Gradually the oxygen is turned on until the proper mixture has been effected. The result is an intensely brilliant light.

There are different kinds of lime burners. The principal ones are: Oxycalcium or spirit jet, blow-through burner, mixing burner, ether saturator.

I may just remark in passing that the electric light is now being used as a radiant in many large institutions where this form of light is employed for general illuminating purposes, but only there; it is not transportable like the other kinds of radiants. Doubtless, when we have it more in our houses, it will become the light for the lantern.

Having now described the kinds of radiants or sources of light, I should like to show you briefly some of the properties of oxygen, for it, combined with coal gas and lime, is the radiant I shall be using to-night with the lantern we have before us.

Until comparatively recently, oxygen for lantern work was made by heating potassium chlorate with manganese dioxide, sand, or some other practically inert substance. If potassium chlorate is heated by itself, it requires a temperature sufficient to melt it before it yields up its oxygen. Should the melted chlorate be spilt and come in contact with any flame, there is a danger of fire; when mixed or diluted, one might say, with manganese dioxide or sand, and heated, the gas comes off at a much lower temperature, and the flow of gas is much more under control.

All chemical compounds are composed of simple elements. For brevity of expression, these elements are known for the most part by the initial letter of the name. For instance, potassium chlorate, of which I am speaking, is expressed by  $\text{KClO}_3$ .

Potassium (Kalium) .....	K=1 part.
Chlorine .....	Cl=1 "
Oxygen .....	O=3 parts.

If, then,  $\text{KClO}_3$  is heated moderately in a retort with  $\text{MnO}_2$ , it yields up its O, the process being—

$\text{K}$	}	$\text{KCl}$ = potassium chloride left in retort as residue.
$\text{Cl}$		
$\text{O}_3$	}	O. Given off as gas.
$\text{MnO}$		

The gas so driven off is collected in bags or gas-holders, and is kept there stored for use. When heating the mixture, a certain amount of  $\text{MnO}_2$  dust, free Cl together with KCl as a fine smoke, come over. These impurities would soon destroy the rubber storage bag; but, as the gas leaves the retort, it is passed through water, and these impurities are got rid of.

When required for use, the gas is expressed by means of iron or lead weights placed on a frame into which the bag is placed. The flow of gas is regulated by means of a stop-cock.

This process of producing and storing O is still carried on, especially where small quantities are required, but in a comparatively short time will be quite superseded by the cylinders of O, which are being extensively supplied to all who require them, and that at a very cheap rate.

The O in this case is practically taken from the air, so that there is no lack of supply, and consequently the cost of material is very low indeed.

Barium dioxide ( $\text{BaO}_2$ ), when raised to a full red heat, yields up one of its atoms of O, leaving BaO as a residue. This O, driven off, is collected in a tank, and is then ready to be pumped into cylinders, of which I shall speak presently. The BaO is allowed to cool, and, in the process of cooling, it absorbs an atom of O from the air. The BaO again becomes  $\text{BaO}_2$ ; this  $\text{BaO}_2$  is again heated to obtain the O, and so on. Whenever a sufficient supply is received into the gas-holder, the gas is pumped by machinery into steel bottles or cylinders, such as I now show you. This cylinder, when full, contains 40 cubic feet of O—equal to a column 40 feet high by 1 foot square at the end. The actual pressure within this cylinder is 1800 lbs. per square inch, or 120 atmospheres. This is an enormous pressure. As a safeguard, however, every cylinder is tested up to twice this amount.

Having, in a somewhat slipshod fashion, described the processes of obtaining oxygen, I shall now demonstrate to you a few of its properties.

First, then, it is non-inflammable. I apply a light to it, and it won't burn, do what I will.

If common air is mixed with it, no explosive compound is formed (in fact, it is O diluted principally with N that forms ordinary air). Not so if air and coal gas or O and coal gas are mixed in certain proportions and ignited, an explosion would be the inevitable result.

Oxygen is necessary for life.

You will all have read about ships' officers having been found dead in their cabins on the morning after a cold night. To make themselves cosy, these officers shut the doors, heaped up the charcoal fire, and went to sleep. In a short time the O was, between the fire and the reathing, all exhausted, and consequently the officers could not live.

I shall demonstrate this to you very simply.

Take a jar with common air, and, with a small candle, gradually burn out the O. In a short time the candle will go out for lack of O. The candle, when burning, requires O, and, in burning, a new gas is formed ( $\text{CO}$ ), which does not support life.

O inhaled, CO exhaled, by human beings.

It may interest you to know that O is now being extensively used by the medical profession in cases of lung disease. I have just demonstrated to you that it is most necessary for life, and, with this in view, the medical men use it undiluted in specially urgent cases. It is known to prolong life considerably, but I cannot authoritatively state that life has been saved by its application. Of course, in the early stages of a deadly disease, its application might prove of more lasting benefit.

O is a supporter of combustion. The experiments to demonstrate this are very remarkable.

I shall now arrange to show you in use one of the burners previously shown to you, and demonstrate the intense heat obtained by the properly adjusted quantities of oxygen and coal gas. In the flame of the mixed gases you can burn a steel knitting needle as easily as one can burn a straw. It is with this intensely hot flame that the lime already shown to you is made to emit the brilliant light for use in the lantern (the lime is made incandescent).

Oxygen is the active element in all bleaching operations. Fresh country air (containing a full percentage of oxygen) with water goes much further in the way of producing spotlessly white linen than the much-adulterated air of our over-crowded cities.

Hydrogen peroxide, the substance with which one can make golden hair out of brown, black, or grey locks, is largely composed of oxygen; this, when applied to the hair, bleaches it (fair hair is bleached hair).

A fifth of the atmosphere consists of oxygen.

Eight-ninths of water

About half of the mineral kingdom consists of oxygen.

"	"	plant	"	"	"
"	"	animal	"	"	"

In fact, half of the entire globe consists of oxygen.

The condenser will now occupy our attention for a few minutes. The condenser consists of one or more lenses, and of varying size, according to the quality of the lantern. Its use is to collect or concentrate as many of the rays of light as possible, so that the object to be projected on the screen will be equally and brilliantly lighted. There are what are termed simple condensers and compound condensers. The former consists of one lens, while the latter may be two or more lenses. The various styles of condensers I have roughly traced on a glass plate. This slide I shall also show you on the screen. The condensers in the better qualities of lanterns are from four to five inches in diameter.

The objective or projecting lens is the lens one sees at the extreme front of the lantern, and its use is to project the rays of light on to the screen.

According to the distance between the lantern and the screen the size of disc or picture is determined. The nearer the lantern is to the screen the more brilliant is the picture, but the size is small. The further away the size is larger, but the illumination is less brilliant. Of course, one fixes on the size of disc to suit the nature of the hall and number in the audience.

Coming to the containing box, or body of the lantern. This may be made entirely of metal, or of wood metal lined. For oil, metal is sufficient, but, where O+H is used, it is desirable to use wood, metal-lined. The intense heat from the incandescent lime makes a metal body uncomfortably hot, unless it is constructed on a larger scale than those constructed of wood. Such lanterns are made, and they are in every way satisfactory. Wood, being a non-conductor of heat, admits of a more portable apparatus.

Having now shown you the different parts of a lantern, the adjustment of these will next have our attention. This had better be shown in the lantern itself.

Two things are wanted in a lantern after all the parts are put together—(1) the centering and focussing of the light, and (2) the centering and focussing of the picture. This I shall now demonstrate to you.

It will be quite evident to you that the O+H light is a pure white one. When delicate tints of colour have to be examined at night in paper-works, dye-works, &c., this quality of light is in demand. With it the most delicate tints can be determined. When deciding tints, we can be easily misled if the conditions of light are not favourable.

An important item in a lantern outfit is the screen. The two special features of a good screen are opacity and whiteness. A paper-faced screen is better than a linen one, but the latter is more popular because of its portability.

Having described to you how a lantern is constructed and how to project a picture on the screen, I shall now indicate a few of the uses of a lantern.

We all know with what delight children hail the advent of a magic lantern. The annual Sabbath school treat is quite a failure to them without the pictures on the screen. The old folks, too, enjoy themselves quite as well on such occasions, although, perhaps, they are not so demonstrative as the young folks. In a measure, the enjoyment of the old folks is twofold—the viewing of the ever-varying effects on the screen, combined with the pleasure of seeing the children enjoying themselves. Of course, the quality, style, and subject vary exceedingly, from coarse gelatine transfers to beautifully hand-painted slides, or very fine photographic transparencies. Subjects, from the most awe-inspiring and pathetic to the extremely ridiculous are thrown on the screen, but all these the children are pleased to receive in turn.



For teaching purposes the lantern is making great headway, both in projecting pictures and the shadows of actual apparatus on the screen. Many of our day and night schools use them regularly, and with distinctly marked effect. While forming a means of attraction to undecided or indifferent scholars, it instils into the minds of others new ideas for some noble work. Teaching in the dark was at first objected to on account of anticipated misbehaviour of the scholars, but miracle is the exception, there is too much concentration of thought on the illustrations to admit of frivolity.

Geography can be taught and illustrated by means of maps, on which can be pointed out the cities, rivers, lakes, mountains, &c., requiring special notice. Photographic slides of towns, showing the styles of architecture, the features and dress of the inhabitants, and modes of conveyance, the size of the rivers, with all sorts of craft upon the waters. The geology and botany of a country can be illustrated in the same way. In fact, a subject need only be mentioned, and the lantern will at once do its share of the work.

History can be illustrated by means of photographs from pictures of all kinds of celebrities—statesmen, soldiers, sailors, men of science, and champions of religions; while battlefields, birthplaces, and the many ruins of bygone ages are shown on the screen in the same way.

You can readily understand that the teacher is now appealing to another sense other than that of hearing, viz., sight, and this, one can understand, gives the student of to-day a twofold advantage in his educational course.

Sometimes a large diagram is wanted for a small illustration in a book. With a lantern to help, nothing is simpler. Photograph the illustration, and put the negative, or a transparency therefrom, in the lantern. Project the illustration on to a suitable piece of paper, and then merely trace down the lines with suitable pencils or chalks.

Business men employ the lantern for advertising purposes—projecting illustrations of their specialities on suitable screens in prominent places. For instance, I have prepared some slides of lace which I shall now show you on the screen. I cannot tell the ladies of the audience whether these are up-to-date specimens or not, but they will serve my purpose.

Photographers make use of the lantern for producing photographic enlargements.

There is really no man of science but directly or indirectly makes use of, or can make use of, the optical lantern. The astronomer sets himself the task of being a combined observer, photographer, and lanternist—a comprehensive combination, you will admit.

The anatomist, geologist, physiologist, pathologist, and chemist are appealing daily to the lantern for assistance. Direct sections of the brain are prepared and thrown on the screen for the instruction of the student of physiology, while a combination of camera and microscope supply the botanist and pathologist with invaluable material for their courses of lectures.

It is a most desirable thing that lanternists in turn should be able to photograph. You can well understand what additional power is given to any one when he photographs many of the objects, places, and people he sees during the holiday time. With a store of good negatives he can produce for the winter numerous interesting illustrations for the edification and pleasure of his circle of friends. Or, again, some interesting subject presents itself in a book, it is quite a simple matter to photograph it and add it to the gradually accumulating pile of slides.

In passing, I may say that religious subjects are being taught successfully with the lantern. Ministers are now giving illustrated sermons, and the idea to me seems to be a very happy one.

Apart from the medium of photography, one can make what are termed diagrammatic lantern slides. By means of a piece of ground glass and a pencil one can trace many a book illustration in a manner similar to that employed in a child's drawing slate, the surface of the ground glass being the finest obtainable. After the tracing is complete the glass is coated with varnish, which renders it perfectly transparent; the pencil lines are now protected, and the granular surface of the glass has disappeared. This is mounted in the ordinary way, and the slide is complete. There is no objection, of course, to a freehand sketch being made on the glass, and then finished off in the same way. Further, pieces of glass are coated with a substance which admits of its being scratched off without leaving a ragged edge. Brown or blue are the colours usually employed; the latter colour is selected by teachers of physical geography, for with it they can readily produce a map of the heavens quite natural in effect.

Until now I have spoken of the lantern in connexion with ordinary slides. With your leave we shall go off the beaten track a little and see what other uses we can make of it.

The vertical front, as a modified adjustment of the parts of a lantern is termed, is used by science teachers for many purposes. Experiments that cannot well be shown to a large audience by ordinary means are projected most effectively on the screen by this arrangement.

Without describing it in detail it will suffice to say:—

- (1) That the condenser is split.
- (2) That a mirror is placed at an angle of 45° between the two halves of the condenser (one half of the condenser being at right angles to the other).
- (3) Readjustment of the radiant.
- (4) Table for displaying apparatus.

#### (5) Focussing and directing on screen with a mirror or prism.

The object of this vertical front is to project apparatus lying horizontally, so that they may be viewed in a vertical position. For example:—

The teacher on magnetism and electricity finds this most useful. Wishing to show what are termed magnetic curves, he proceeds thus:—On the glass table he places a small horseshoe magnet, and sprinkles near the poles some fine iron filings by means of a pepper box, and taps the table gently, observe curves. Further, the magnetic needle and its relation to the electric telegraph. The principle which I shall next show you bears an important part in telegraphy. It was discovered by Oersted in 1820 that, when a current of electricity was passed over a magnetised needle, the needle was deflected or caused to move out of its normal position of N and S. Here I have a needle pointing N and S. Observe, when I bring the wires from a battery near to it, there is a sense of uneasiness; when close, the needle deflects, + and —. What I have just shown to you demonstrates the fundamental principle of the electric telegraph. Supposing I wanted to write on the screen any problem in arithmetic or a chemical formula, it can be easily done by this same arrangement, KClO<sub>3</sub>, &c.

A fitting to an optical lantern is the erecting prism. Its function is to project objects in their natural position on the screen—not inverted as they would otherwise be. When I wish to show, say, the separation of the gold leaves of an electroscope, the action of an acid on chips of marble, the precipitation of a chemical, a fish swimming, and, in short, when I wish to project the shadow of any small object on the screen, I employ the erecting prism.

The microscope is used with much effect in connexion with the lantern.  
A. H. BAIRD, F.R.P.S.

#### LANDSCAPES AND CLOUDS.

MR. CADETT's paper on this subject, read before the Camera Club last week, was listened to by a large audience with great interest, for it touches upon a point which is of the greatest importance to the aspiring amateur. It need hardly be demonstrated that many of the landscapes which find favour in the eyes of Judges at our exhibitions owe their success to cloud effects, and, when the ordinary amateur notes this, he strives hard to go and do likewise. He has generally stored away landscape negatives without number which are terribly monotonous in their absence of clouds, and he looks forward to the time when he shall be able to wed them with suitable atmospheric effects and once more bring them to the light of day as new creations. But it must be confessed that Mr. Cadett's paper did not tend to help these owners of stored treasures, for he dealt exclusively with the possibility of securing clouds and landscape on one negative simultaneously.

It was somewhat unfortunate that Mr. Cadett had to commence his discourse with an apology, and, moreover, a double barrelled apology. In the first place, he spoke under the distressing grip of a bad cold, and, in the next, he had hoped to show a number of pictures taken in Switzerland, which pictures had failed to come out as he had intended. It is a comfort for insignificant workers to hear that an expert sometimes goes wrong (just as most persons are not grieved to hear of friends' misfortunes), and such workers, if any were present, must have chuckled when they heard the lecturer confess that he had failed to get his Swiss exposure meter adjusted for altitude, and had forgotten to back his plates. However, he was able to illustrate by means of other persons' pictures, the various points touched upon.

Some unkind critics had on a former occasion accused him of seeking, by means of a lecture, a gratuitous advertisement, and, as a manufacturer of dry plates, he was, of course, open to such remarks; but he would ask his hearers how he could, occupying the position which he did, avoid talking shop? He felt quite sure that at the Camera Club at least he would not be misunderstood.

Although generally he associated himself with the scientific side of photography, he was now more particularly to speak of it in its pictorial aspect. On many occasions he had seen very beautiful lantern slides exhibited on the screen before them, especially Swiss views, but he could not help noticing that, in some of the finest, the deep shadows were far too deep, while at the same time the high lights were burnt out. He thought that he would be able to show how such faults might be obviated.

In the first place, let them consider the range of the photographic plate, i.e., the range of correct gradation. This word "gradation" was not well understood, as we all found last week when, in the course of discussion upon Captain Abney's paper, he (the lecturer) had a little passage of arms with regard to it. Captain Abney maintained that a quick plate had a better range than a slow one, a statement with which he could not agree. But it was more than possible that they did not both define the word "gradation" in the same way, and were consequently speaking at cross purposes.

If densities or opacities on a plate are proportional to the light which produced them, they must be correct. A slow plate has a very extended range, and, although you hear people complaining of such plates giving hard negatives, it must be remembered that, by proper control in development, a slow plate can be made to give a picture as soft as may be desired. It was not to his interest as a manufacturer to cry up the



virtues of slow plates, for any one can make them, but he is bound to say of a slow plate that it will give a far greater range than a quick one. He would pass round two negatives, with positive prints, one of which was exposed for five seconds and the other for fifty seconds. The negatives were developed together for precisely the same time, and yet the two prints are absolutely identical. With a rapid plate it would be quite impossible to show such a result.

Now with regard to clouds. With an ordinary plate and screen, if we fully expose for the landscape, the clouds not only are over-exposed, but they become reversed. If, also, the cloud happens to reflect as much white light as the blue on which it is placed, the cloud disappears on the plate. If, therefore, we want to represent clouds, we must, by means of a proper screen, cut down the blue. Any screen which will do this is better than none, but, of course, it is best to have a screen which will do the work well, while at the same time it assists the other colours in the picture.

He would now show, by means of the lantern, three landscape slides taken by means of Mr. Sanger Shepherd's screens, one under blue, another under green, and the third under red, and it would be seen that there was very little difference between the green and the red. To compare with these, he would show some pictures taken with the spectrum plate through a mixed screen. The improvement was at once evident, but the increase of exposure was about forty times. It may be taken as a certainty that most photographs showing the presence of fine clouds have been due to the use of well-corrected screens and colour-sensitive plates.

The lecturer concluded his remarks by some observations upon the important subject of backing plates, and detailed some experiments which proved the great advantage of backing in obviating halation, and other markings due to internal reflection between the surfaces of a glass plate.

The Chairman (Professor Armstrong) described the paper as being both valuable to photographers as well as highly interesting, and he invited a discussion, which should be a full one, considering the number of experts who were present.

Mr. Bothamley alluded to the extraordinary latitude of many plates in the market, and to the possibility of obtaining the same printing results, provided that time were given to the experiments, from negatives of various exposures. He had often shown that very much improved results could be obtained with an orthochromatic plate and a simple yellow screen, and he might say that, as far as pure landscape went, such a screen met all his requirements. The yellow screen had the advantage also of not increasing the exposure over-much. Where clouds came in, the mixed screen would do better work, and they were indebted to Mr. Cadett for expending so much time and skill in perfecting it.

Mr. Sanger Shepherd said that fully one half of the beauty of a landscape resides in the clouds which hang above it, and, wherever there are clouds, especially white ones, the photographer who wishes to represent them accurately must use a screen corrected for all colours, for such a screen must naturally include white; but, where very little red comes into a composition, a yellow screen will do good work. A screen correcting blue and green only would be valuable for snap-shot work, and such a screen, if placed on the market, should have a wide future before it. But a screen for general work should be carefully adjusted for the plate employed, and not used for any other make of plate. You might as well put a sewing needle into a planing machine, in that you would be using a tool for a machine quite foreign to it.

Mr. Horsley Hinton could not agree with the remark of a former speaker as to the virtues of a yellow screen. He had tried every screen in turn, and none came up so nearly to his ideal as that produced by Mr. Cadett. It was difficult to secure clouds and landscape on the same plate, especially when cumulus clouds were presented on a blue sky, and he had found the Cadett screen to make the work easier than any other. He did not think that backing was an unmixed benefit to a plate. In some pictures he had taken the outline was so hard that he afterwards much regretted that the plates had been backed.

Colonel Gale remarked that he used ordinary plates for his landscape work, and printed in his clouds from separate negatives.

After a few remarks from Mr. George Davison and others, the Chairman said that the discussion showed that we were advancing to a marked extent. It was true that the use of orthochromatic plates and screens was not new, but there was a decided novelty in the employment of screens accurately adjusted to plates. He thought that we must all congratulate ourselves that we had among us a plate-manufacturer who was content and able to approach such an important matter from a scientific standpoint. Mr. Cadett has acted in the prosecution of these researches as a German manufacturer would have done—he could not pay him a much higher compliment.

Mr. Cadett having replied to the questions which the discussion of his interesting paper raised, the meeting came to a close with the usual vote of thanks.

#### AN AMERICAN EDITOR IN LONDON.

MR. F. DUNDAS TODD, Editor of the *Photo-Beacon*, publishes in his journal for October some photographic impressions obtained in London during his recent visit. It will be observed that Mr. Todd was not very favourably impressed with the things he saw—except what was of American origin.

"I rather reluctantly interrupted my usual programme and started for London in order to make a tour of those interested in photography and see whatever they had that was new. For five days I wandered round the big metropolis, and during that time saw only two things that I considered of sufficient importance to mention to my readers, and even one of these I am afraid will not be put on the American market. It is a new variation of colour photography on the plan of the Ives Kromskop, but is only possible with plates that are on the English market.

"The other should, I fancy, some day be introduced to the photographers of the United States, as it consists of a new film to be used either in roll or out-size form. A company is being floated to manufacture it in Britain, and those who are pushing it are very sanguine of its success. They show some excellent prints made from negatives made with the film, so that it has every appearance of being practicable. It has been dignified with the title of 'Secoco' film.

"I had the pleasure of seeing through the rooms of the Royal Photographic Society, but they are only in the transformation stage, so that they were not specially interesting. Very different was the Camera Club, which is housed in a very commodious building, comfortably furnished, where a man could spend many pleasant hours each day. I also visited one of the meetings of the Photographic Club, but, as it was the 'off' season, only five members were present, so that the meeting was very uninteresting.

"I was very much impressed with the difficulty of reaching the average business man in London. On entering the office a boy of about fourteen waits on you. He wants your name and address, full particulars of your business and intentions, and you wonder why he does not ask you to produce a certificate of good character signed by a clergyman and head of police. All these he dutifully lays before a youth a few years older than himself. He in turn puts you through a severe examination, and apparently notes the character of your pockets to see if you have anything in the nature of concealed weapons about you. He in turn reports to a higher authority, who leisurely surveys you from a distance so as to make sure of your respectability, then proceeds to put you through a regular cross-examination. Fully satisfied, he informs you that he will see if Mr. Blank is in. All this takes about ten minutes. At last you are asked to 'step this way,' and are shown to a room that is reached by a regular labyrinth. Here you rest for about five minutes, as Mr. Blank is busy just at present. At last he appears, looking most solemn and serious, for however much he may be full of fun outside the walls, an English business man must never smile between the hours of 9 a.m. and 6 p.m. Truly, if an Englishman's house is his castle, his office is the citadel. It seems to me that it would not do him any hurt if he met Tom, Dick, and Harry a good deal oftener, and learned what the public wanted instead of trying to sell them what he thinks it should have.

"I was much impressed with the average air of untidiness and neglect, not to speak of the antiquated fittings of the average London business man's office. His accommodation would simply be unlettable in Chicago, excepting to a poor class of tenants. I think I came across elevators only twice, and these were small, poky things, travelling at the rate of a mile in a thousand years. By the way, they are called 'lifts' in this part of the world, and this is claimed to be correct as you can lift a person either up or down, but you can elevate in only one direction.

"While doing a growl about offices, I may say I found one run on the American plan but it was an American company who owned it, the Vive Camera Company, and it was run by an American, Mr. Shedd. His door stands with the latch-string out, and there is a clear road from the door to his desk. The latter, by the way, was the only decent desk I saw in all my travels, in fact it was a beauty and was made in Chicago.

"And right here I may as well make a confession. In starting from Chicago my better half and I had a conversation during which we discussed the differences between what we were leaving and what we were about to see. At length we agreed that the Americans were the more practical people, but the old-country people could beat them in style. We take it all back, and humbly acknowledge that, whether it is household fittings, office arrangements, dress, or tools, the Britisher has much to learn."

#### PRECIPITATION OF GOLD FROM CHLORIDE OR BROMIDE SOLUTIONS CONTAINING IT.

MESSRS. FREDERICK WILLIAM MARTINO and FREDERIC STUBBS' invention relates to improvements in the precipitation of gold from chloride or bromide solutions containing it, the solutions referred to being such as are produced in the well-known "chlorination" process and the less-known "permanganate" and "bromide" processes.

The essential feature of the invention is the employment, for precipitating gold from the above-mentioned solutions, of metallic carbides, which, when brought into contact with water, produce a hydrocarbon gas, or the employment of such hydrocarbon gases, however they may be manufactured.

Carbides of the metals of the alkaline earths, calcium and barium carbides, for instance, produce acetylene when treated with water, and methane is produced in a similar manner from aluminium carbide.



In the following specification the terms "metallic carbide" and "hydrocarbon gas" are to be understood as referring respectively to the carbides and gases above mentioned.

In carrying out this invention, a hydrocarbon gas is passed through a chloride or bromide solution containing gold, or a metallic carbide is added to the liquid, thus producing a nascent hydrocarbon gas; in either case the chloride or bromide of gold is decomposed and the metal precipitated.

If the chloride or bromide solution contains free chlorine or free bromine, it may be found advisable, before treating the solution by the method herein described, to remove the excess of chlorine or bromine by any convenient process, preferably by passing a current of air through the solution, in order to avoid the waste of metallic carbide or hydrocarbon gas which is necessary to neutralise these elements before precipitation commences.

In the permanganate process the small quantity of permanganate present in the solution of auric chloride is immediately decomposed by the metallic carbide or hydrocarbon gas, and precipitation of gold then proceeds rapidly.

Heat from any outside source may, if desired, be applied during any of the stages constituting this improved process; for instance, the chloride or bromide solution may be heated before or during treatment by passing steam through pipes immersed in it, or the vessels containing the solution may be steam-jacketed.

### "LE SALON DES FUMEURS."

BY AN OUTSIDER.

THIS is not a public-house sign, it is not a secret password of the Boers nor is it an expression to indicate that the writer is sitting in the smoking saloon on board a French steamboat—nothing so vulgar as all these things, but something infinitely higher, nobler, and more artistic. It is a description, culled from my old French friend on the mantelpiece, to express (like the polished parlance of the invitation card) its English equivalent (?), viz., the "At Home" of the Photographic Salon, given at the Dudley Gallery, on Tuesday evening, the 17th instant, of blessed memory.

Now, though this was called an "At Home" it wasn't really an "At Home," although everybody thought it was an "At Home," but, then, everybody was wrong, not really wrong, you know, but not quite right, for the grey slip called it a "Smoking Conversation," and surely this must have been correct, as the grey one also announced, in very small letters, as if ashamed of the fact, that "sherry" and "Scotch whisky" were to be had, and also "sandwiches of ham," "pâté de foie gras" (with all the accents carefully placed) "anchovy," "sardine," "caviare," "and shrimp." Truly a feast for the never-hungry gods. I don't know whether there was a supply of the delectable fluid made from a certain celebrated brand supplied gratis by the Mazawattee Company, but I do know that that night I dreamt that there was a great tea sale at the Egyptian Hall, and that every purchaser of one packet of this marvellous compound would be presented with a Salon picture. There was a run on the tea, but nobody would take the pictures. Of course, this was only a dream, and I have a shrewd idea how it was I came to dream that dream. It was the fault of the waitresses. I said waitresses, not that they were really waitresses, but everybody thought they were, and so did I till I had partaken of two sherries and sodas, given in mistake for whisky, of course. Still that accounts for the dream—and "other things."

Many and distinguished were the guests, and I was glad that I had been able to borrow my old dress suit from my uncle's for the auspicious occasion so that I might meet some of the Royal Buckhounds and hear the bleatings of the "Linked Lambs" at one and the same moment. It was, indeed, a sight worthy to be photographed, and it was done. That photograph will contain a collection of faces and forms associated in the eyes of the world with Literature, Science, Music, Painting, and, let us hope, Pictorial Photography, as well as of men connected with the more vulgar forms of earning a livelihood.

Linked rings became the order of the night—small tables with gradually enlarging circles were seen all around the room. Conversation became more lively as the potent fluid circulated and the smoke got thicker. The portraits on the walls seemed to unbend and smile more sweetly than one would have thought possible in visages so stern, the eyes would appear to twinkle through the smoke and we all felt comfortable. Our senses were lulled by dulcet sounds the like of which one would never have suspected to emanate from the throats of savages. Yet the savages with one exception provided the amusement of the evening.

Speaking of photographs on the walls recalls a little incident which took place early in the evening. It was something like this:—

First Spectator (A): I say, Bill, look here, what's this (looking at No. 1004, vide catalogue)?

Second Spectator (B): Don't know—think they've hung it wrong side up, but it's a landscape any how.

(A): Not it; those black things are not trees, they are figures. It's a funeral procession—but here's Charlie, let's ask him.

(Charlie approaches.)

(B) to (C): I say, Charlie, come and tell us if this isn't a landscape.

(A pause of fifteen minutes during which Charlie has been scrutinising the print.)

(C) (sighing): Give it up old chap, can't make head or tail of it (passes on).

I sighed too when I heard this, and thought what heathens there are in the world, to be sure! Just think of it—not to be able to appreciate the beautiful pictorial creations of the *élite* of the photographic Salonians! sentiment is non-existent in the breast of the casual observer, and his powers of artistic appreciation are a minus quality!

But, in spite of the foregoing incident, I managed to get a back seat—a camera obscura kind of seat where I could survey the kaleidoscopic mass of humanity around, and for even an every-day observer of faces and amateur character student there was plenty to see and study at the Dudley Gallery. Some day the world will be startled by the publication of "Moustache and Whisker Studies" but it wants the pen of a Dickens to do it. What food for his pen he would have found at the Salon Smoker!

There was the man "whose moustache went up under his nose, and whose nose came down over his moustache," when he smiled. "The Dundreary," the "Zola," the curly American combine, the fierce military, the "Kaiser," the "Sims Reeves" (with hair to match), the "Whisp," and the "Whacker." All these, and many more, in combination with bald pates, coal blacks, greys, browns, shorts and longs, curls and straightens—in fact, heads of the thoroughly representative cosmopolitan kind; but the curious part about it to me was that not one of the persons present looked as if he ever soiled his hands with pyro stains. I should have taken the company for anything but photographers, but this is, no doubt, owing to my ignorance of the "genus photographic." Yet stay, there was a gentleman with a velvet coat and enormous pipe who did look like a photographer, but I was told he wasn't one.

The warlike spirit was absent from this gathering; the feeling of amity was such that even the suggestion of a popular patriotic song, such as "Soldiers of the Queen," was tabooed, and "The Old Rogeroo" was left at home (perhaps for fear of wounding the delicate artistic sensibilities of the Salonians), though the Savages, no doubt, would vastly have enjoyed the same, together with the chorus thereof.

Foremost amongst the performers was Mr. William Nichol, whose mellifluous notes stole sweetly o'er the photographic soul, filling it with peaceful balm (not German yeast). Mr. Reginald Groom enunciated sweet sounds, in spite of the nicotineous atmosphere, and Mr. Odell was funny. Mr. John Edwards was imitatively Irish in his humour, and Mr. H. Severn told a sensational story—not really a sensational story, but everybody thought it was a sensational story until they heard it, and found they had been "had" by the reciter's comicalities, which were productive of much laughter. Mr. David Devant took us into the land of shadography (without the w), and called forth frequent applause from the clever "handling" of his subject. When the sandwiches were all devoured, the whisky and sherry all gone, our own and everybody else's tobacco at the lowest ebb, the Lion and the Lamb did a mutual growl, agreed to differ amicably, and went to their respective lairs.

### CROYDON CAMERA CLUB EXHIBITION.

AFTER an interval of some years the Croydon Camera Club has held its third Exhibition of photographs. The Exhibition, which was open from the 18th to the 24th inst. at the Art Gallery, Park-lane, Croydon, reflected great credit upon those who organized and carried it out. The Gallery was admirably adapted for the purpose, the pictures well arranged, and the average quality of the work very fair.

The Judges were Mr. A. Horsley Hinton, Rev. F. C. Lambert, and Mr. Percy S. Lankester. That they considered twelve of the 137 entries in the Members' Classes worthy of being medalled might be taken to indicate that there was an extraordinarily large proportion of meritorious work. The explanation is, however, that there were six classes, and, while we are bound to say that the members' work was, as a whole, distinctly creditable, we must once more make a strong protest against the system of unnecessarily multiplying classes, the result of the system being that photographs which would be hopelessly out of competition if entered in the subject classes to which they belong receive medals, because the negatives were taken under some particular circumstances.

As one would expect in the Exhibition of a society in which Mr. Jas. Packham takes a leading part the gum-bichromate process was well represented, in fact, nearly one-fifth of the pictures were printed by that method; but we left the Exhibition still unconvinced that the process, as a photographic process, supports the extravagant claims that have been made for it. That, with its assistance, it is possible to make a photograph unlike a photograph, and, perhaps, indeed, to avoid the bad qualities of some photographs, there was evidence to show; but there was an equal amount of evidence to show that the remedy is generally worse than the disease. Still, we must admit that there were a few examples beyond reproach in any respect.

In the open classes, the Champion Class was, as usual, a weak one, and, in itself, an object-lesson in the absurdity of indiscriminate medal-giving. Still, there was some good and representative work, Fred Marsh's well-known pictures of *Gasworks* taking the gold medal. The



general class contained a very fair proportion of interesting pictures. Among the well-known names we noticed were H. K. Foster, W. Illingworth, E. Marriage (silver medal), J. I. French, J. Leslie T. Shawcross (bronze medal), J. H. Avery, Mrs. Welford, Messrs. Byrne & Co., C. Speight, W. Howell, and W. H. Mayna. A class open to all amateurs residing in Croydon attracted quite a large entry, several of the competitors being ladies, and one of them, Miss May Donaldson, was fortunate enough to secure two of three awards.

The Lantern Slides Classes were unusually large, twenty-two sets being entered by members, and sixteen in the open classes, and the average quality was good. We were glad to find a class for stereoscopic transparencies and prints, but to notice that, although it was an open class, the five sets were all sent by members.

The competitive classes were supplemented by a loan collection. The five series of window transparencies of large size by Mr. Henry Stevens afforded the visitors an opportunity of seeing examples of the very highest class of technical photography. No less interesting and instructive was the collection of Alpine and snow scenes by Mrs. E. Main; Messrs. Percy Lankester, Lyddell Sawyer, and W. D. Welford also contributed, and the Platinotype Company had a collection of platinotype prints, mostly copies of paintings.

Lantern shows were given each evening and X-ray demonstrations. On the tables, colour photography was represented by Ives's Kromskop.

The following is the list of awards:—

#### MEMBERS' CLASSES.

Class A (Landscape, Seascape, and River Scenery).—Silver medal, Jas. Packham; bronze medal, L. Kough.

Class B (Portraiture, Figure Studies, Animals, and Flowers).—Silver medal, E. A. Salt; bronze medal, T. H. Towley.

Class C (Architecture).—First award, Hector Maclean (medal declined).—Silver medal, W. H. Rogers; bronze medal, G. W. Jenkins.

Class D (Enlargements).—Silver medal, A. E. Isaac; bronze medal, L. Kough.

Class E (Pictures taken at Club Excursion).—Silver medal, G. W. Jenkins; bronze medal, no award.

Class F (Hand-camera Work).—Silver medal, F. W. Hicks; bronze medal, H. Moore.

Class G (Lantern Slides).—Silver medal, G. W. Watson; bronze medal, H. E. Holland.

#### OPEN CLASSES.

Class H (Champion).—Gold medal, Fred Marsh.

Class I (Picture not previously medalled—any subject).—Silver medal, E. Marriage; Bronze medal, J. Leslie T. Shawcross.

Class J (Open to amateurs residing in Croydon).—Gold medal (withheld); silver medal, Miss May Donaldson; bronze medal, W. H. Roger; Bronze medal awarded to Miss May Donaldson, but withheld.

Class K (Lantern Slides).—Silver medal, A. E. Smith; bronze medal, Edgar Bull.

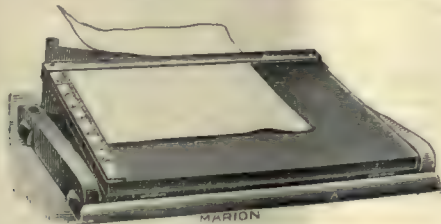
Class L (Stereoscopic Transparencies and Prints).—Silver medal, G. W. Watson.

## Our Editorial Table.

MERRETT'S TRIMMING DESK.

Marion & Co., Soho-square.

It is claimed for this form of photographic print-trimmer that it possesses simplicity of action, with the minimum of labour and greatest speed, and gives perfect results; and that it will trim either paper or cardboard, divide negative films, midjet prints, &c., with great rapidity. The



instructions for use are: Place the print on the desk, allowing the part to be trimmed off to pass under and beyond the steel band at the top, then, while holding the print in position, press the desk down as far as it will go. The cut is thereby made, and, upon releasing the pressure, the desk rises automatically, ready for the next cut. A rule gauge fitted to each desk ensures accuracy in cutting.

#### THE ILFORD MANUAL OF PHOTOGRAPHY.

By C. H. BOTHAMLEY, F.I.C., F.C.S. Price 1s. Ilford: The Britannia Works Company, Limited.

Of the many books that have been compiled for the instruction of those taking up the practice of dry-plate photography, this is one of the few

that could least be spared. It is late in the day to single out for praise a manual which has reached its hundredth-thousand copy, but we are bound to say that, in again making the acquaintance of Mr. Bothamley's book, we are struck as forcibly as ever with the wide and intimate knowledge of theory and practice which he brings to his task, and with the soundness and clearness of his teachings on the optics, chemistry, practice, and other phases of his subject. We can conscientiously give the *Ilford Manual* the heartiest recommendations. The book has been brought up to date throughout, reset with new type, a chapter added on "Platona," and also an appendix treating on "Photographic Chemicals, How to Keep and Use Them." These additions and improvements constitute the book as complete as it is useful.

The Company kindly furnish us with the following interesting data on the subject: "The whole of the hundred thousand have now been sold, and we have just received 5000 more copies from the printers, more than half of which are disposed of. It is unnecessary for us to point out that it is only the few publications which reach such figures as these, even in general literature, whilst in a photographic book such figures are never reached. The success of the *Ilford Manual* is therefore the more gratifying to us, and reflects great credit on the author. From a business point of view we are proud to feel that we have been, more or less, the means of adding a hundred thousand workers with 'Ilford' goods to the already long roll of our supporters. What this means in sales will be appreciated even by those who have no knowledge of the subject."

Both the publishers and the author may be congratulated on the continued success of the *Ilford Manual*, which is a handsome book, and thus, in addition to its practical value, makes a worthy addition to the photographer's library.

#### PHOTOGRAMS OF 1899.

Compiled by the Editor and Staff of the *Photogram*, assisted by Mr. A. R. C. CARTER. 192 pp. Price 3s. London: Dawbarn & Ward, Farringdon-Avenue, E.C.

We have no doubt that amongst the many photographers who annually add *Photograms of the Year* to their library, some curiosity will be aroused as to the manner in which Mr. A. R. C. Carter has acquitted himself in the position of successor to the late Gleeson White as critic in chief of the two "great" Exhibitions. Mr. Carter, in our opinion, easily justifies his choice, for he writes clearly and instructively of the photographs, and with an absence of that high falutin and meaningless jargon which is only too frequently the sole stock in trade of the art critic who condescends to criticise photographs. Mr. Carter is in close touch with his public, and we are convinced that the producers of the photographs he criticises can profit by what he has to say of them. For the rest, *Photograms of the Year* 1899 preserves the main features of its predecessors. The principal R.P.S. and Salon photographs are reproduced; the Continent, the United States, and the Antipodes have been laid under contribution for representative work, and interspersed throughout the book are examples not hitherto publicly shown. All concerned in the production of the book have done their work extremely well. Our set of *Photograms of the Year* has an honoured place on our bookshelves, and we find it of constant and increasing value for study and reference. The latest addition to the series takes its assigned position as a matter of course, and we can give it no better welcome than the hope that it may be followed by innumerable successes just as great.

#### CATALOGUE RECEIVED.

Walker & Co., 19, Bridge-street, Aberdeen.

HER MAJESTY the Queen has several times honoured Messrs. Walker with a command to give cinematograph and optical lantern entertainments at Balmoral Castle. Their catalogue extends to over forty pages, and it appeals to those who wish to take advantage of the facilities which the optical lantern offers for winter-evening entertainments. We note the word "cinematograms" in Messrs. Walker's catalogue.

## News and Notes.

PHOTOGRAPHIC CLUB.—November 1, at eight o'clock. Annual General Meeting.

ROYAL PHOTOGRAPHIC SOCIETY.—Monday, October 30, "Surrey Commons, Ponds, and Rivers, &c.," by T. M. Brownrigg; Wednesday, November 1, "Animals studies," by Mr. Charles Reid; Saturday, November 4, "Belgium Revisited," by W. D. Welford.

MESSRS. FUEBST BROS., of 17, Philpot-lane, London, E.C., are issuing the following cinematographic pictures relating to the war:—1. Sir Redvers Buller's embarking on *Dunottar Castle* at Southampton, October 17, 1899; 2. (a) Sir Redvers inspecting the ship, (b) Sir Redvers bidding farewell from the bridge; 3. The ss. *Dunottar Castle* leaving the dock; 4. Coldstream Guards embarking on troopship *Gascon* (close view); 5. Coldstream Guards embarking, showing the Royal Engineers in the foreground; 6. Departure of troopship No. 4 (*Nubia*) with Scots Guards on board.



**THE Hon. Secretary of the Southsea Amateur Photographic Society.** 10, Ordnance-row, Portsea, writes: "I should feel particularly obliged if you could draw attention to the date of our Twelfth Exhibition, viz., January 29-31, 1900. It promises to be a big affair. There are five open classes, and one for beginners only. Prospectuses, &c., may be obtained from me on application."

**X RAYS AS A DEPILOYER.**—The following comparatively old story is still going the rounds: "People will do well to tight shy of the X rays as a depilatory. A lady was placed opposite a tube for twenty minutes, four days in succession, and she came to the conclusion that the result of the experiment was just nothing at all; but, after a week had elapsed, she found that the rays had removed not only the superfluous hair, of which she desired to be rid, but the skin also."

**THE Whitehaven Y. M. C. A. Camera Club's Exhibition of Photographic Work** will be held in the Assembly Rooms, at the Baths, Duke-street, Whitehaven, on Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday, December 4-9. Entry forms and all further information can be obtained from the Secretary, Mr. W. E. Mason, 67, Duke-street, Whitehaven. The following is the schedule of Classes:—Open to amateurs only, within the counties of Cumberland and Westmoreland: A, Landscape or seascape (any size); B, Enlargement (any subject), not less than four times enlarged; C, Lantern slides, set of four slides (any subject); D, Figure studies and portraiture. Open classes, for amateurs and professionals: E, Instantaneous work (hand or stand camera), subject to show evidence of motion; F, Landscape or seascape (any size); G, Enlargement (any subject); H, Figure studies and portraiture; I, Architecture. Open only to amateurs resident in Whitehaven or within a radius of two miles: K, Hand-camera work; L, Set of four prints.

**NEXT CENTURY'S ECLIPSES.**—As to eclipses in the coming century, says a contemporary, there will be about 380 of them, the number of solar being to the number of lunar in about the ratio of four to three. What is of very rare occurrence in a calendar year will happen in 1935, the first time since 1823, viz., seven eclipses, the largest number that can happen in a year. There are eight total solar eclipses predicted to occur visible in the United States, in 1918, 1923, 1925, 1945, 1954, 1979, 1984, 1994. There will also occur twelve transits of Mercury on the following dates: November 12, 1907; November 6, 1914; May 7, 1924; November 8, 1927; May 10, 1937; November 12, 1940; November 13, 1953; November 6, 1960; May 9, 1970; November 9, 1973; November 12, 1986; November 14, 1999. The first, second, ninth, and tenth will be wholly visible in the United States; the seventh and eighth only partially so. A transit of Venus, however, which is of much more consequence, will not occur within the next century. The earliest date predicted is June 8, 2004.

**THE Judges for the Borough Polytechnic Society's Annual Exhibition, to be held on December 27, 28, 29, and 30, are the Rev. F. C. Lambert and Messrs. John A. Hodges and E. J. Wall.** Gold and silver medals are offered in the open classes. Entry forms are now ready, and can be had of the Hon. Exhibition Secretary, Mr. E. J. Hoar, 59, Hillingdon-street, S.E. The monthly print competitions, in connexion with the Society's summer outings, have just been concluded, and Mr. E. W. Burch is hailed the winner of the greatest number of points, and therefore receives a silver medallion. The popularity and success of these competitions have prompted the executive to institute a series of lantern-slide competitions throughout the ensuing winter. Points will be awarded for each slide by two qualified Judges selected from the members, who will criticise all slides and advise as to the best means of improving them. The winning slides and any the Judges may select will go to form a collection, which may be borrowed by any member for a period not exceeding fourteen days. A silver medal, bronze medal, and certificate are offered.

**RE HENRY BARROW TREVETHICK, photographer, 1, Orchard-street, and 36, Fife-street, Sheffield.**—The first meeting of the creditors interested under this failure was held at the offices of the Official Receiver for the Sheffield district, on Thursday, under the presidency of the Official Receiver (Mr. J. C. Clegg). The Official Receiver, in his report, stated that debtor owed 292. 11s. 6d. to unsecured creditors, and had a deficiency of 255l. 15s. 11d. Prior to 1897 he was in partnership. That partnership was dissolved, and he had carried on business since on his own account. He had been insolvent for a considerable time. According to his own account, he owed 100% more than he was able to pay twelve months ago. Since that time he had incurred other liabilities, and had increased his loss by nearly 100% by attending balls, exhibitions, and the like. He supposed, like other debtors, he had hoped to pull round, but, instead of doing that, he had gradually got worse. Debtor said his bankruptcy was due to bad trade and want of capital. No resolutions were passed, and the estate will therefore be wound up by the Official Receiver in the usual manner.

**ELECTRICITY AS A LIGHTHOUSE ILLUMINANT.**—The correspondent of a contemporary claims that extended scientific examination of the matter, based upon the best opportunities of judgment, have more and more led to conclusions unfavourable to the employment of the electric arc for lighthouse purposes—that, in clear weather, other lighthouse illuminants are amply sufficient in power, and the electric light is very apt to mislead the navigator as to his distance from the light, while, in hazy or foggy weather, repeated observations, alike by mariners and scientific men, have shown the inefficacy of the new light, even of the most powerful description and in a lighthouse of the first order, though this, it is admitted, may be due in part to the fact that rays of high refrangibility, such as are emitted by the light in question, are more largely absorbed by a fog than rays of lower refrangibility that are emitted by oil or gas. Another more potent cause, in the estimation of this writer, lies in the very condition which gives the arc light its great value for optical uses, namely, its concentration in a minute area compared with oil or gas, but regarded as a positive disadvantage for a lighthouse illuminant in foggy weather.

**SANDELL "PERFECT" COMPETITIONS.**—The following are the results of the September competition:—10l. prize, three snap-shots—*A Torn Sail, Sunset, and Storm Clouds*, Mr. T. E. Corney Wilson, Liverpool; 5l. prize, *A Sail-maker's Loft in Old Portsmouth, West Porch, Canterbury Cathedral, St. Gabriel's Crypt*, Mr. F. J. Mortimer, Portsmouth; 1l. prize, two studies—*Now I'm Granny, and Inattentive Scholars*, Mr. A. Durn, Wotton-under-Edge; *Three Architectural Studies*, Mr. E. A. Spivey; two studies—*At the Smithy Door, and In Eads Colne Church*, Mr. C. S. Tyler, Earls Colne; three snap-shots—*Fast Falls the Even-tide, The Sun is Sinking Fast, and The Darkness Deepens*, Mr. T. R. Beaufort, Westminster; *Interior, St. Peter's Church, Drogheda*, Mr. Alex. B. Hogg, Belfast; *Christ Church, Bristol*, Mr. Harold E. Brightman, Bristol; *Ornamental Food-house*, Mr. William Robinson, Clapham Junction; three studies—*Interior of Morning Room, The Harvest Field, and Drilling*, Mr. J. T. Newman, Berkhamstead; three studies, *One Cloudy Summer's Evening, Bathing, and Lilium Auratum*, Mr. Percy F. Coggin, Chelsea; *The Solent, from Cowes Parade*, Mr. W. C. Hope, Cowes.

**MESSRS. NEWTON & Co., of 3, Fleet-street, E.C., are issuing the following slides, which are of great interest at the present time:—The Transvaal: Map of South Africa; Bloemfontein—General View, English View, Market Square; Group of Kaffirs and Hut; Crossing a Drift in Ox-wagon; Van Staaden's Pass, Starting from Camp; Durban—Town Hall, West Street; Johannesburg—The Reef, The main Reef, The first House built, the Market-place; Kimberley—View of the Railway, Market Square, Diamond Mine, De Beer Mine, Compound of De Beer Mine, Searching Nigger for Diamonds; Natal—Karoo Kloof Falls, Harbour, Pinetown Kaffirs at Pool; Port Elizabeth main Street; Pretoria—Government Buildings (Road Saal), Camping out of the Dutch before the Nachmaal; Transvaal—Stage Coach, Gold Diggings; Major Wilson's Last Stand; Floreat Etona at Laing's Nek; Burial-ground at Laing's Nek; Jameson's Raid—The last Stand; Sir George White, V.C., on Horseback; Sir Revers Buller; President Kruger at home; Boers returning from Market outspan on the Trek, examining the new Rifles; Boers' Commando leaving for the Front; Field Cornet delivering Orders at a House. Wireless Telegraphy: 1. Portrait of Professor Hertz, with autograph; 2. Standard Hertz resonator; 3. Professor Oliver T. Lodge's portrait; 4. Syntonic Leyden jar experiment; 5. Spiral-wire coherer; 6. Diagram of Lodge's experiments with receiver enclosed in metal; 7. Lodge's alternative arrangements of insulated capacity areas for long-distance signalling; 8. Lodge's coherer and diagrams of complete coherer circuits; 9. Lodge's and Muirhead's improvements in syntonic telegraphy, showing all connexions for a complete station; 10. Portrait of Sir W. H. Preece; 11. Diagram of apparatus for magnetic induction, showing principle of Preece's system as adopted by the Post Office; 12. Preece and Lodge's recent improvements in magnetic space telegraphy; 13. Complete arrangement showing connexions, &c.; 14. Signor Marconi's portrait; 15. Marconi's short-distance apparatus; 16. Marconi's receiver and transmitter; 17. Receiving apparatus with cover removed; 18. Wireless telegraph station at the South Foreland Lighthouse; 19. The Marconi transmitter in the lighthouse, connected for telegraphing to Wimereux; 20. The receiving apparatus at the lighthouse connected up; 21. The mast carrying the vertical wire at the South Foreland Lighthouse; 22. Receiving a message at the South Foreland Station; 23. The mast at the Wimereux Station; 24. Receiving a message from Dover at Wimereux; 25. Facsimile and transcription of dot-and-book message sent by the Queen from Dover to Wimereux to the Mayor of Boulogne.**

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
30.....	Bradford Photo. Society .....	{ Instantaneous Photography. Harry B. Buckley.
30.....	Camera Club.....	{ Some Principles of Development. Alfred Watkins.
30.....	Kingston-on-Thames .....	{ India and Ceylon. J. D. Gibson.
31.....	Birmingham Photo. Society ..	{ Extraordinary General Meeting.
31.....	Hackney .....	{ New York and Washington. W. A. Ellington.
November.		
1.....	Photographic Club .....	{ Annual General Meeting.
1.....	Southsea .....	{ Demonstration: Multiple-coated Plates and Films. J. T. Sandell.
1.....	West Surrey .....	{ Scenes in the Isle of Man. W. G. Rowse.
2.....	Camera Club .....	{ Scenery in the Canary Islands. T. O. Porter.
2.....	Liverpool Amateur.....	{ Lantern in Use.
2.....	London and Provincial .....	{ Demonstration: The Biokam. The Warwick Trading Company.
3.....	Ashton-under-Lyne.....	{ Elementary Photography Class.

### ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 24,—Technical Meeting,—Mr. G. Scamell (Hon. Treasurer) in the chair.

#### LIGHTNING AND ELECTRIC LAMPS.

The Hon. Secretary showed a frame of prints, sent by Mr. Sidney Webb, of Dover, through Sir H. T. Wood, exhibiting some curious phenomena which occurred during thunderstorms, the lightning playing in a very singular manner among the electric arc and glow lamps on Dover Pier.

#### THE WELLINGTON FILM.

Mr. H. WADDE read a paper upon the subject of the new Wellington film, a transparent negative film supported during exposure upon a paper backing. It may be exposed either in rolls or cut sheets, or in the form of "daylight."



cartridges." After exposure it is developed by any of the customary developing solutions, preferably pyro ammonia, and after immersion for a quarter of an hour in an alum bath it is fixed and washed, and then squeegeed down to dry upon a thoroughly clean sheet of glass or ferrotype. When dry, the film may be separated from the paper support, but the latter is very translucent and free from grain, and printing can be carried on without stripping if desired. The stripped film is flexible, possesses a fine matt surface, which much facilitates retouching, and may be varnished by being dipped in a varnish requiring no heat. It is made from the purest photographic gelatine, and, as the entire support is chemically inert, the keeping qualities of the film are equal to those of a glass plate. The speed numbers are 80 H. & D., and 56 by Wynne's exposure meter, but it is claimed that the backing of white paper acts in such a manner as to give an increase of the actual exposure, and that the films are therefore sufficiently rapid for hand-camera work. The negatives possess great delicacy of gradation and fineness of grain, and are entirely free from halation, and may be printed from the reverse side without loss of definition, a very convenient feature for carbon and colotype work. The process of stripping was demonstrated by Mr. Wade, and is exceedingly simple and certain, it being only necessary to cut through the gelatine film, insert the point of the knife between the latter and its support, and then pull them gently apart. A number of negatives on roll, cut, and daylight films were shown, together with prints from front and back, and some enlargements; and they certainly justified all that had been said on their behalf.

Mr. T. BOLAS said that for a good many years he had considered himself the originator of the "daylight cartridge" system, which he described at a meeting of the South London Photographic Society in, he thought, the year 1885; he had, however, quite recently discovered that his idea had been "stolen by the ancients," for in 1855 it was fully detailed by an Indian officer, Captain Barr, in *Notes and Queries*.

Mr. J. B. B. WELLINGTON, in reply to some questions as to the manipulation of the film, said the pyro-ammonia developer was recommended because it had no deleterious effect upon the paper support. Pyro soda answered very well if development was not continued for more than fifteen minutes, but, if that time was exceeded, there might be a difficulty in stripping. It was very important that the negatives should be kept in motion whilst in the various solutions, and particularly when in the fixing bath. The use of the alum bath was essential in order to keep the films flat during subsequent operations, and formalin could not be employed as a substitute.

Mr. F. W. JACKSON said that Captain Gladstone had used films in a 12x10 hand camera, keeping them flat by pressing them upon a carrier tablet coated with a tacky substance, and he suggested that a similar plan might be adopted when using the Wellington films.

Mr. WELLINGTON, however, said the plan would not answer in this case, as the paper support would absorb the moisture in the tacky substance, which would consequently require frequent renewal.

Mr. BOLAS thought the difficulty would be overcome by coating the carrier with lead plaster, which would retain its tackiness for any length of time.

The CHAIRMAN had used the films with much success, developing with metal soda; he had put a number of negatives together into the hypo bath and allowed them to remain without moving until fixation was complete, and, when washed and dried, they stripped as readily as others which had been carefully kept in motion.

#### THE PRESIDENT.

The Earl of Crawford was present at the meeting, and was heartily congratulated upon his restoration to health.

#### COMING EVENTS.

November 7, lantern lecture at 5a, Pall Mall East, "Some Mediaeval Towns of Germany," by Mr. J. J. Vezey, with lantern slides from negatives by Commander C. E. Gladstone, R.N. November 14, Ordinary Meeting at 66, Russell-square, when the general business will be followed by the second Traill Taylor Memorial Lecture, on "The Teachings of the Daguerreotype," by Major-General J. Waterhouse, I.S.C.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 19.—Mr. A. Mackie in the chair.

Mr. R. P. DRAGE expressed surprise that photographic chemists had done so little to place methods of combined toning and fixing upon a scientific and definite basis. A perfect understanding of these methods was a thing to which he looked forward with a keen interest, and he hoped that some steps would soon be taken to compass the end he had in view. In the making of prints by the combined method, they were told that no preliminary washing was required, but that the prints ought to be immersed in a dry state, with all the free silver they contained. In the case of separate toning and fixing, a certain period of washing was, however, obligatory, and he was very anxious to do away with this, and to simplify the whole matter as far as might be consistent with permanence.

Mr. S. HERBERT FRAY, although neither an advocate of the combined or the separate method, believed that the keynote to success with the former was to allow definite quantities of gold to each sheet of paper to be toned, and to use the bath once, and once only.

The CHAIRMAN did not know that it was necessary to wash P.O.P. prints in water prior to toning by the separate method, as intimated by the member who introduced the subject. He never did it himself. He usually put salt in the sulphocyanide bath, and found with this that the prints could be put in dry. The immersion of the prints in a dry state was not convenient if many prints had to be treated, however, on account of sticking together, and in such cases he would put them first in salt and water. He also put salt in the toning bath, and found no necessity to rinse the prints between their emergence from the salt bath and entry into the toning bath. He rather thought that the maker's formulae were often too implicitly followed. He suggested that Mr. Drage should conduct some experiments on the lines indicated.

Mr. PHILIP EVERITT asked for a formula for the platinum toning of matt P.O.P. for sepia tones.

Mr. WALTER D. WELFORD said that he had succeeded best with Marion's formula on Paget paper. The result was dependent entirely upon the paper used, tones varying with the many different makes.

Mr. EVERITT said that there were plenty of recipes for black tones, but not so for the sepia tones, which he wanted.

The CHAIRMAN added that many P.O.P. prints emerged rather badly from the plain platinum bath. The colours of these he had altered to his taste by fixing and washing and again toning in sulphocyanide and gold.

Mr. HARRY WADE read a paper upon

#### THE WELLINGTON FILM.

He assumed that he was addressing an audience of amateurs, for to them the film was likely to appeal more directly. Amateurs, as a rule, followed the pursuit of photography in order to afford themselves pleasure. They looked at photography as an agreeable hobby, and with this view in mind manufacturers of apparatus and materials were striving to make everything of the lightest construction consistent with strength. But of what use, he continued, was the light camera and tripod if heavy glass plates were obligatory? It was ourselves who were not consistent, consequently our sensitive medium must be of a similarly light nature. We have had celluloid films for some time; but so far, in competition with glass plates, they have been behind. There remained, then, still an opening for a reliable substitute for glass plates, at the same time of a reasonable price, although the latter consideration, to the man who wanted the best possible results, was only of secondary importance. He submitted that the Wellington film more nearly answered the ideal requirements of photographers than anything yet made from the point of view of lightness, facility of storage, and applicability to every circumstance. The film had all the advantages of celluloid without its disadvantages; it was as good as a glass plate as regards its evenness of coating and general freedom from defects, without its weight, and it could be used in sheaths, roll-holders for daylight changing, and in the ordinary dark slides. The construction of the film was described as a transparent sheet of the purest gelatine, supported upon a paper backing of a very grainless kind, the emulsion being coated upon the said gelatine surface. Double the keeping qualities of celluloid films was claimed for the new film, which was also equal in the same respect to glass plates. The film was not of that inflammable nature which marred the prospects of celluloid. The emulsion was perhaps not the most rapid, but it was very rich in silver, and the negatives would hold their own for delicacy, brilliancy, gradation and fineness of grain. A strong point in favour of the film was that it could be equally well printed from either side. For carbon printing, the colotype process, &c., it was thus of great value. Double transfers and reversals would be things of the past. Halation was unheard of with the film, and the messy backing operations were therefore unnecessary. Manipulations were the same as for plates. The speed of the emulsion was given as 80 H. & D., or 56 Wynne. But, whilst this is the speed of the emulsion, the speed of the film is much higher on account of the paper support, which appears to absorb the light or keep it in the film, thus giving an increase of exposure. The film is sufficiently rapid for hand-camera and instantaneous work. Any developer may be used, but pyro ammonia is specially recommended. Mr. Wade said, however that he had successfully used others, and showed results in support of this remark. After development the film is well washed, and immersed for ten or more minutes in

Common alum .....	2 ounces.
Water .....	40 "

It is again washed, fixed in an acid or ordinary hypo bath, and finally washed for an hour. The negative is then squeegeed to a ferrotype plate, and dried in a cool place. The negative will be found to detach itself when dry. It is quite possible for the negative to be used for printing on its paper support if so desired; but, if a transparent negative is required, the film must be stripped from the paper. Before this can be done, the whole thing must be quite dry. A cut is made through the gelatine at one edge, and the same lifted up, the knife being passed round the edges of the negative. The two gelatine films may then be removed in close contact from the paper.

A large number of examples was passed round, and an interesting discussion ensued.

#### PHOTOGRAPHIC CLUB.

OCTOBER 18.—Mr. Walter D. Welford in the chair.

The nomination of officers and notices of motion for the annual meeting, having been made,

Mr. F. A. BRIDGE showed a sheet of albumenised paper which was so very badly marked as to render it useless for printing. The makers had informed him that the fact that the paper had been albumenised in the spring would account for the defect named.

The Club, however, was of opinion that the marks were caused through carelessness in handling during albumenising or sensitising, and that

"The eggs that are laid in the spring, tra-la,  
Have nothing to do with the case."

The HON. SECRETARY read a telegram from Mr. W. Thomas, expressing his regret that he could not attend the Club to read his promised paper, as he was ill in bed with a bad cold.

The Club expressed its sympathy with Mr. Thomas, regretting at the same time the opportunity it had lost of listening to his expected paper.

Mr. STRETTON asked what was the experience of members as to self-toning paper, and whether there was really any gold in it. He had himself tried a certain brand of this kind of paper, and he got fairly good results. The prints had a decidedly toned appearance after being fixed.

Mr. MASON corroborated this statement, his experience having been the same. He thought it advisable to soak the prints in water before fixing them, and it transpired that this had a decided effect on the eventual colour of the prints.



**North Middlesex Photographic Society.**—October 16, Mr. F. W. Cox in the chair.—Mr. H. W. BENNETT, F.R.S., gave a lecture on

#### ENLARGED NEGATIVES.

He first dwelt on the advantages of large-size photographs as compared with small, particularly if for exhibition. The quality of an enlarged photograph could not be compared to advantage, as a rule, with one taken direct to the same size, but the exposure was much less. He described the apparatus required, which was of simple design and all made by himself. A camera and single slide, large enough to take the enlarged negative, and a frame to hold the positive to be enlarged from, both sliding on a grooved board. The camera had no bellows, but a double thickness of black twill was used instead. The dark slide was made of a drawing board, with grooved strips of wood fastened round to take the negative and shutter, which could be made of ebonite or millboard. The frame for the transparency had a recess to hold the positive, and the space between it and the camera was covered over with a large focussing cloth. He gave formulae for finding the distances and exposure required for various sizes of enlargement. With regard to the positive, he found nothing gave better results than transparency plates, bearing in mind that a positive like a lantern slide was not required. Twice the exposure required for the latter is given, and very little bromide used in the developer, and there must be no clear glass in the positive. Better results were obtained by backing both the transparency and the enlarged negative, which could be made on an ordinary dry plate.

**Leeds Camera Club.**—October 18, Mr. W. J. Warren (President) in the chair.—A lecture, with limelight illustrations, was given by Dr. LLEWELLYN MORGAN, of Liverpool, on

#### SUMMER AND WINTER VISITS TO THE ENGLISH LAKES.

Starting from Windermere, the lecturer took his audience to Troutbeck village, showing its yew-trees, its simple form of church, but which in its essential features was admirably suited to its surroundings, and went down the brook past the Bobbin Mill over Windermere Lake. Hawkshead, High-low Tarn, and Upper Langdale Valley were in turn shown, as well as the Slaters' Bridge, built by primitive workers, beautiful in its form, and the admiration of architects of the present day. Continuing along the valley, many interesting features were pointed out, and at Ambleside the old mill was presented in its summer and winter garb. Leaving Ambleside, Rydal, with its memories of Wordsworth, and many beautiful views of Thirlmere were given, showing that, as time softens down modern encroachments, the natural beauties will be little interfered with. Over the hills the lecturer passed to Brotherswater and Ullswater, with a run to Haweswater, backing to Thirlmere, and so on to Derwentwater and Keswick. Many quaint and picturesque views of Keswick were given, and from here Buttermere and Crummock waters were visited, and the coast reached at Ravenglass. Continuing along the Duddon valley to Broughton, and with a short railway journey to Furness Abbey, the journey ceased. The lecture was in many respects a remarkable one. It was illustrated by over a hundred slides of fine technique and artistic rendering, such a series as probably have never been shown to a Leeds audience. The lakes, mountains, and passes are beautiful in summer, but when shown in their winter covering, by contrast they appear even more beautiful, and their magnificent grandeur more adequately appreciated. Dr. Morgan kept his audience enraptured throughout with his interesting and racy anecdotes, at one time full of mirth when dealing with his difficulties and the freaks of his camera, the too inquisitive onlookers, or the still more mystified cattle, all of whom would persist in taking any but the right position for artistic treatment; or when, with inimitable pathos, he gave some touching, yet sad, incident.

**Dundee and East of Scotland Photographic Association.**—October 12, first monthly meeting of the session, Professor Steggall (President) in the chair.—Mr. Vanessa C. Baird (Hon. Secretary and Treasurer) submitted the annual statement of accounts, which showed a balance in favour of the Association of 77. 19s. On the motion of Mr. Ogilvie, seconded by Mr. Hill, the accounts were adopted. Professor Steggall, in retiring from the presidency, said he was sorry to have to mention that during the past year there had been a large number of resignations owing to the imposition of a uniform subscription of 10s. Between forty and fifty members had been lost in this way, which reduced the strength of the Society very materially. He, however, hoped that during the coming session the members of the Society would do their best to keep together and support the Society as loyally as possible, and strive by every means in their power to increase its usefulness and membership. The balance-sheet was thoroughly satisfactory, and for this they owed a debt of gratitude to Mr. Baird, the Hon. Treasurer. They had not only wiped off an adverse balance of 54., but they had carried forward to next year's account almost 82., so that they had gained something like 132. on the year's work. He had now held the office of President for three years, and he had very much appreciated the confidence the members had shown him. It had always been a pleasure to him to take the chair, and he desired to thank the Society for their extremely hearty support towards him. Mr. W. F. Hill was thereafter elected President in room of Professor Steggall, who was heartily thanked for his past services. Messrs. W. H. Tittensor and William Salmond were appointed Vice-Presidents; Mr. Vanessa C. Baird, Hon. Secretary and Treasurer; Messrs. J. S. Lawson and William Bertie, Auditors; and Professor Steggall, Dr. Tulloch, and Messrs. Salmond, Kilgour, and Lamb, members of Council. Mr. Sandell, of the Sandell Films and Plates, Limited, thereafter gave a demonstration of the working of the Company's Perfect (multiple film) plates and films, for which he was heartily thanked.

#### FORTHCOMING EXHIBITIONS.

1899.

October 27-Nov. 4 ... Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.

October 27-Nov. 11... Royal Photographic Society. Hon. Secretary, Major-General Waterhouse, 66, Russell-square, W.C.

„ 27-Nov. 19... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.

November 15-17 ..... Hackney Photographic Society. W. Selfe, 70, Paragon-road, Hackney, N.E.

„ 20-25 ..... Longton and District Photographic Society. Thomas Mottershead, 43, Stafford-street, Longton, Staffordshire.

„ 27-Dec. 18 American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.

December 7-9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.

„ 11-Jan. 1900 Huddersfield (Invitation). W. A. Beevers, Cloth Hall-street, Huddersfield.

„ 27-30 ..... Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.

1900.

January 29-31 ..... Southsea Amateur Photographic Society. F. J. Mortimer, 10, Ordnance-row, Portsea.

April 3-7 ..... Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Patent News.

THE following applications for Patents were made between October 9 and October 14, 1899:—

CAMERAS.—No. 20,338. "Improvements in or connected with Photographic Cameras." Complete specification. J. FLECK.

DAYLIGHT CHANGING.—No. 20,547. "Improvements in or relating to Photographic Apparatus particularly applicable to 'Daylight' Changing of a Series of Flat Sensitive Surfaces." A. L. ADAMS.

DARK-ROOM LAMP.—No. 20,549. "A Portable Electric Incandescent Coloured Lamp or Dark Lantern for Photographic Purposes." A. L. ADAMS.

PRINTING.—No. 20,643. "Process for Photographic Reproduction of Patterns, Designs, or Pictures on Fabrics and other suitable substances by the application of Mordants, Dyes, and the like." F. DORAMER.

CAMERAS.—No. 20,590. "Improvements in Photographic Cameras." W. PATTERSON.

CINEMATOGRAPHY.—No. 20,621. "An Improved Method of Projecting the Titles or Descriptions of Films used in Cinematographs or other Animated Photograph Machines." W. C. L. HOLLAND.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### FILM PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Your leader upon the future of film photography has interested me so much that I feel constrained to offer some remarks upon it. The writer considers that the want of satisfactory dark slides greatly handicaps films. But why use dark slides for films? Is not the roll-holder the appropriate instrument for a flexible support? The very flexibility that is such an advantage in the one is as great a disadvantage in the other. The dark slide is inherent to the use of glass plates, but not to films, for which it is in no way adapted. Moreover, the roll-holder method of carrying films enables the designer to give us unique conveniences altogether impossible if the films must be carried in dark slides. One has only to study carefully the designs of the various film cameras brought out of late years chiefly by the makers of the Kodak to see this.

But I suppose that the dark slide is thought necessary in order that a focussing screen may be used. And here again I might ask, Why use a focussing screen? (I am speaking of hand cameras which cause the chief demand for films). A focussing screen is chiefly useful for two



purposes (a) to arrange the picture that is to be taken; (b) to get a sharp focus. Well, as to the first, constant usage is every day making the photographer more apt to depend on the view-finder for this, and the results are quite satisfactory. The professional assuredly will stick to the focussing screen till necessity makes him dispense with it. Yet the marine work of such firms as Adamson, West, and Priestly, done under circumstances which preclude the use of the focussing screen shows no lowering of standard from that cause. What is true of marine work should also be true of landscape work where the focussing screen is possible. For architecture and portraiture the hand camera is scarcely adapted, but even here the want of a focussing screen in no way precludes from getting satisfactory results. The depth of definition of the lens is such that merely stopping down will give all possible sharpness when using a swing back or rising front. In the case of one  $\frac{1}{2}$ -plate hand camera a stop  $f.64$  will allow the sensitive surface to be tilted as much as  $20^\circ$  from the vertical. With regard to the other question of getting sharpness of definition there is even less to be said. A hand camera worth using is or ought to be focussed by a microscope by a trained optician working under the most favourable circumstances. The photographer in the field can scarcely hope to equal his results. With regard to objects within infinity the depth of definition is so great that very little practice is necessary with most people to estimate the distance with sufficient accuracy, and, if there is any doubt, a smaller stop will make sharpness certain.

And here I might remark on the tendency to use a hand camera that will be an omnium gatherum of everything common to stand camera and hand camera. It cannot be too strongly urged that the efficiency of a hand camera, as of all instruments or machines which are intended for constant use, is directly proportional to its simplicity and consequent ease of working. The most satisfactory and serviceable cameras are those in which everything not absolutely essential has been sacrificed for the sake of convenience in use. It is quite a fallacy to sacrifice a considerable proportion of the cost and convenience of a camera on some detail that will not be used in ninety per cent. of the pictures taken. I have often thought that it is by acting on such a principle as this that those makes of hand cameras which are so well known, and which stay with us year after year, have been designed. Many a camera has been put upon the market which would allow different kinds of plates, use of a focussing screen, double extension, &c., but how many of them remain as permanent landmarks in the hand-camera world as have done, e.g., the Kodak and the Frena? They may be appreciated by faddists, but the world at large wants the most convenient camera that will take the ninety per cent. of the pictures, not the inconvenient camera, specially designed with the idea of taking the other ten per cent., of which, as often as not, a large proportion are failures or unsatisfactory.

By, then, restricting the movements and capabilities of the hand camera to such as will enable us to take, with the utmost ease, the great majority of subjects we encounter, we not only get a more convenient camera, but also one of greater precision and certainty. The man who uses a Frena, for example, to take a picture will only have to do three things; the man who uses a hand camera fitted with dark slides, filled with different kinds of plates, focussing screen, focussing hood, &c., will have to think about, goodness knows, how many things, and who can say that he will get a result so much better as to reward him for all his trouble and the risk (never absent even in the most expert) he runs of getting no picture at all by forgetting some necessary movement. Life is too short for such multifarious manipulations, labour of love though they be.

The roll-holder, as adapted to the modern hand camera, such as the folding cartridge Kodak, and, more particularly, to the folding pocket Kodak, affords us very many advantages of portability, lightness, compactness, small cost (as compared with slides), and gives satisfactory results in the majority of the pictures the average hand camerist takes. It is foolish to sacrifice all this for the sake of being able to take, say, one out of ten pictures on an isochromatic plate or film, or for some other such reason.

But the writer of your leader seems to have altogether missed the one disability that handicaps rollable films more than anything else. I refer to the cost—three times that of plates. If a paper film is put on the market at a price something like that of bromide paper, and of as good quality, I can see no reason why (backed up by the numerous roll-holder cameras, which are every day almost being added to) it should not soon oust glass. Money governs most of our actions nowadays, and, if the photographer of to-day can get a serviceable film at from 6d. to 9d. for quarter-plate size, he will manage to forego the various advantages which plates offer, just as his predecessors gave up, first wet collodion for the more convenient dry plate, and then the high-priced dry plate for the cheap plate, until now most of us use the 1s. a dozen plates without the slightest qualms as to their quality, which, of course, never will be as good as the wet collodion of the old days.—I am, yours, &c., H. M.

#### THE LEVIATHAN SPECIALITIES.

To the Editors.

GENTLEMEN,—In the current number of THE BRITISH JOURNAL OF PHOTOGRAPHY we notice a Mr. Peterson inquires for the manufacturers or wholesale dealers of the Leviathan concentrated colours.

We are more than surprised that he has been so misinformed through the medium of your JOURNAL, we having been established for over forty years, and well known to be the proprietors of the trade mark "Leviathan."

We would request you to cause a correct statement to be published in your next issue. We, Joseph Levi & Co., 97, Hatton-garden, E.C., are the firm whose name should have been inserted.—We are, yours, &c.,  
JOSEPH LEVI & Co.

97, Hatton-garden, late 40, Fumival-street, Holborn, London,  
October 21, 1899.

#### CONVENTION BADGES.

To the Editors.

GENTLEMEN,—I shall be glad if you will allow me, through your columns, to inform members of the Photographic Convention who were unable to be present at the Gloucester meeting that I have a few badges remaining over, and, should any unwilling absentees desire to have them as a memento, I shall be pleased to gratify them as far as the limited supply will admit.

Thanking you in anticipation,—I am, yours, &c.,

F. A. BRIDGE, Hon. Secretary and Treasurer.  
East Lodge, Dalston-lane, London, N.E., October 23, 1899.

#### PHOTOGRAPHY AND THE WAR.

To the Editors.

GENTLEMEN,—I don't know whether you had received news of the storming of Impati Hill, near Glencoe, when your paragraph was written. If not, though we have no photographic representation of it, your reference to "another battle of Majuba Hill, with the defeat of our brother Boers" was a peculiarly happy one.—I am, yours, &c.,

SURGEON-LIEUT.-COLONEL.

#### THE PHOENIX HAND CAMERA.

To the Editors.

GENTLEMEN,—The short report of the showing of my new hand camera at the recent meeting of the Photographic Club would convey the impression that the method of using a reflector to throw the image on a full-sized ground glass is the distinctive feature of my camera.

Over thirty years ago Mr. Sutton invented and patented such a method, and I am very anxious that I should not be counted amongst the very numerous inventors of old photographic inventions. The special feature of the Phoenix is that the setting of the mirror into its  $45^\circ$  position, or the releasing of it from that position, changes the plate that has previously been exposed, and brings the next into the position for exposure, so that it is absolutely impossible to expose the same plate twice over, and thus also reduce the necessary movements to a minimum.—I am, yours, &c.,

S. D. McKELLEN.

Mill-street, Long Millgate, Manchester, October 24, 1899.

### Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

#### PHOTOGRAPH REGISTERED:—

W. A. Crockett, The Market House, Taunton.—Photograph of employees of Taunton Manufacturing Co.

STAMPS; and many others.—In our next.

G. C. would like to know a good book on water and oil tinting.—A work on the subject is published by Messrs. Newman & Co., 2 Soho-square.

"A CONSTANT READER," who asks us some questions about development and lighting, is referred to our rule, printed in almost every number of the JOURNAL, against answering questions put by persons who withhold their names.

AMERICAN PLATES.—GEORGE OSBORNE. The brand of plates named is of American make, and there is no agent for them in London or elsewhere in England; consequently, if you want them, you will have to import them yourself.

ORTOL.—Mew writes: "I see that Mr. W. D. Welford is reported in last week's issue of the JOURNAL as mentioning the enormous latitude in exposure allowed by development with ortol. As one who has hitherto used only pyro, I shall be obliged if Mr. Welford will give the formula for ortol for both snap-shots and time exposures, giving the proportions of accelerator and restrainer."



**STAMP PORTRAITS.**—G. BRIMMEL asks: "Could you give me the address of a firm that does stamp portraits, as a customer of mine wants some, and I do not see any advertisements for such appearing now?"—Wells & Co., Southgate, N.

**LENS FOR INTERIORS.**—J. COX. Both the lenses are good, but we should recommend you to employ the one designated B for general work. But A would be better when a wide angle has to be included. Better buy both, as they are so cheap.

**FERRO-GALLATE PAPER.**—J. L. HODGSON says: "Can you give me instructions for preparing and use of ferro-gallate paper?"—A series of articles on the iron processes appeared in the JOURNAL a short time ago, commencing May 12 and continuing weekly. These give full instructions on the subject.

**PAPER FOR ENLARGEMENTS.**—S. BENNETT. The Velox and similar papers are too slow for enlarging upon with the lantern. Of course, they might be used with a very prolonged exposure, but we expect it would be a question of hours with paraffin as an illuminant, even for a small enlargement.

**PHOTOGRAPHIC FILMS.**—WEISE & Co., 1, Guildhall-chambers, Basinghall-street, E.C., ask: "Be kind enough to inform us of the manufacturers of photographic films."—In reply: If by "films" cut celluloid films are meant, then Messrs. Fitch, Fulwood's Rents; Austin Edwards, Warwick; and other firms manufacture them. But the question is somewhat vague.

**URANIUM TONING.**—H. A. AYLWARD says: "Will you kindly favour me with a good uranium toning bath for bromide prints? I used one some time ago (formula lost); got splendid tones, but, on immersing in water, the image and tone washed nearly out; is there anything to prevent this?"—Nitrate of uranium, 10 grains; ferricyanide of potassium, 10 grains; acetic acid, 5 drachms; water, 1 pint. Wash for a less time in order to avoid change.

**LANTERN SLIDES.**—C. A. S. The two lantern slides are far too dense to look well on the screen, also the lights are considerably veiled, which is fatal to a lantern slide. You would get far better results by using plates specially made for lantern slides than by using ordinary plates. Lantern plates are made that are quite rapid enough for reduction in the camera. Are you not aware of that fact? We imagine not from your letter.

**METALLIC SPOTS ON PRINTS.**—THOMAS BOWKER asks: "Can you tell me the cause of the small spots on the enclosed print. Some of them, you will notice, have quite a metallic appearance? The paper is a drawing-paper that I purchased at an artists' colourman's in this city. Some of the prints are, if anything, worse than the enclosed."—The spots are due to metallic particles in the paper. Paper may be excellent for drawing and yet be, like this, of no use for photographic purposes.

**IMPERFECT FIXATION.**—R. C. says: "Can you please tell me the reason for the appearance on this negative? It was not there at first, but came on after about a couple of dozen prints had been made from it. It is a publication picture, and I have several others that have gone in the same way; I am perfectly sure the negative was thoroughly washed."—The fault is that the negative was not properly fixed in the first instance. When that is the case, no amount of washing will prevent this trouble.

**UNEVEN TONING.**—N. J. BIGNOLD says: "Can you please account for the stains on the enclosed print? They could be seen before they were put into the hypo, but they became more pronounced while they were in it. They are on ———'s P.O.P. They were toned in the sulphocyanide bath of the usual strength. I have never had such an experience before with this paper."—Yes, we can account for it. The prints were not kept moving about while they were in the toning solution, and, consequently, they have toned unevenly. That's all; they are not stained.

**BAD TREATMENT.**—REMEDY writes: "In the spring I was engaged here as operator and retoucher at 38s. a week, for a year certain. Last week I received a fortnight's notice to leave, my employer telling me that he could not keep me on during the winter, as business then was always very bad. Cannot I hold him to his agreement?"—Yes, certainly, if you have a written agreement; but, we are sorry to say, you cannot unless you have. We regret to say that assistants are often served as you are by unscrupulous employers at the end of the season where there is no written agreement.

**REVERSING A FILM.**—G. G. says: "I shall be obliged if you will give me a reliable formula for reversing a film on to another glass that will not stretch and distort it in the manipulation? I might explain that I have copied several negatives containing four to eight views reverse way, for use with autocopyist, intending to make Christmas-card views of town. It is not a success, and I now wish to reverse the films the right way, and print them by photographic papers."—First, well harden the films in alum or formalin, then immerse them in very dilute hydrofluoric acid, six or eight drops to the ounce of water, the film will then leave the glass. If the film should expand, it may be brought to its original dimensions by immersing it in methylated spirit.

**VARIOUS.**—GWALLA asks: "1. Can you give me the address of some firm or firms that manufacture those cameras we often see in the fairs and at the seaside? The photograph is one and a half inches square on thin tin. They are taken and finished in about two minutes for about 6d. each. 2. Does it require some great skill in working the camera? Could an ordinary photographer work same with little practice? 3. I have exposed some half-plates outdoor (extra rapid). I get details well, but lacking in density. I think it is under-exposure. No softness, but rather hard printing."—1. Mr. Nievsky, Avenue-road, Shepherd's Bush, W.; or, Fallowfield, Charing Cross-road, W.C. 2. Yes, certainly. 3. Probably the plates are under-exposed, but without seeing the negatives we cannot give a definite opinion. Possibly it may be the fault of the development.

**BOOKS ON PHOTOGRAPHY.**—GUILD says: "About a fortnight ago I wrote asking information as to the best books to get on the history and development of photography, so that I could write a paper (entertaining and instructive) for our young people's guild. In your issue of the 13th you promised my answer in the next week's paper. I have looked through last week's issue, and cannot see any reference to my query. I presume it has slipped your memory. I shall be very glad if you can oblige me this week."—In reply: If our correspondent will consult page 656 of our issue for October 13, he will find his query duly answered.

**FORMULA WANTED.**—MRS. G. B. HARKNESS writes: "1. Would you kindly supply me with the formula for the ferro-prussiate or blue print process, as I cannot remember the proportions? 2. I should be glad to know when THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1900 will be out, as I desire to procure a copy at the earliest opportunity; and whether it is possible to still get a copy of the 1899 edition, as it has got very torn!"—In reply: 1. In the JOURNAL for May 12, 19, 26, June 2 and 9 last a series of articles on iron printing was published. These we recommend our correspondent to procure. 2. The ALMANAC for 1900 will be ready in December. The 1899 edition is out of print.

**VARIOUS.**—OPERATOR says: "1. Recently I have been troubled with plates frilling to a shocking degree, and have tried common alum, chrome alum, and formalin. The latter has failed to act at all, and the first two produce markings which are unaccountable to me, especially the former. These patches take considerably longer to fix than remainder of plate, and, if any further doctoring (such as reducing) is required, the reducer refuses to act on these parts. What is the cause of the patches, and why does formalin fail to act in my hands? 2. At this time of year I am much troubled by sitters coming when there is practically no light. Will you be good enough to acquaint me of an artificial light which would not run into a great expense to have fitted up, easy to manipulate, sufficiently rapid to take children in not more than a second, and not require a lot of attention like magnesium; in fact, a good, quick, steady light which would enable me to take many sitters in a short time, and give short exposures whenever necessary? I should like a very clear answer to this, and full information as to how and where I can gather full particulars as to prices, &c. 3. Please name a good, cheap, and simply written book on the photographic lens, and where obtained. I have unfortunately forgotten all the algebra I learnt, and therefore prefer simple, understandable reading. 4. I use the pyro-soda developer and am much annoyed with the unsightly stain on fingers. I have no faith in finger-stalls, as they are clumsy, and are useless when punctured. What acid or other treatment is best to use to keep a pair of respectable-looking hands? I have tried nearly everything with only partial success. 5. I make up my pyro thus: soda sulphite, 8 ounces; bromide of potassium, 80 grains; sulphurous acid, 30 drops; water, 80 ounces; and pyro, 1 ounce. Why should this rapidly deteriorate and get badly discoloured in a few days?"—In reply: 1. The alum is not sufficiently washed out of the film before the plates are fixed—that is the cause of the patches. We cannot say why formalin does not act in your hands. It answers well with others. 2. The only light that will answer the mentioned requirements is the electric light. Write Messrs. Gwynne & Co., Brook-street, Holborn, or Messrs. Adamson & Co., Dashwood House, 9, New Broad-street, E.C. 3. Taylor's *Optics of Photography* (Whittaker & Co.). 4. See page 972 of the ALMANAC. 5. The solution should keep well. Possibly the sulphite of soda is at fault, or the water impure.

C. K. T. asks the following sixteen queries: "1. Why does not some maker bring out a hand camera for roll for 100 or 200 exposures with tube and ball release, arranged so that the pressure of the ball makes exposure, and on rebound brings new film into place, these two motions both following from one pressure of the ball, the result being that, at an event, exposures could be made quickly following one another? 2. What are the conditions for the certain result in using cold gum dammar and benzole varnish? Although the solution is decanted quite clear, the result is occasionally right, and oftener matt, fatal to lantern slides. If varnish and plate are warmed, result is improved. 3. In the ALMANAC there are plenty of formulae on retouching varnishes and negative varnishes, but none for transparencies and lantern slides. 4. In the formula the proportion of hypo to water for fixing gelatine plates is not given. 5. There is no formula for amidol to develop bromide papers. 6. Proportion of dammar to benzole is not stated on pages 1054-5. 7. Page 1055, wet process; what is the pyroxyline best suited for? 8. Can you give a formula for collodion for black-and-white work, also pyroxyline for ditto, and developer for ditto? 9. Hypo fixing for wet plates? 10. Water varnish for wet plates used when plate is wet after fixing? 11. Is there anything new about Cowan & Iles's idea for borders to lantern pictures (see page 839)? 12. What is their address? 13. What is the highest-power arc light that can be used in projection under the most favourable conditions for the arc, say ten-inch condensers (triple) and large lantern? at present it appears only to be 20 amperes and 80 to 100 volts (see page 953). 14. Is there any arrangement for the lecturer to press the button and automatically change the slide? 15. If there are several plans, could you describe them? 16. Can you get up another limelight jet competition to find the jet giving most light with least gas?"—Reply: 1. This query had better be referred to the makers of the apparatus. 2. Make the film thoroughly dry before varnishing. 3. The same will do for both. 4. We thought every one knew that about four ounces to the pint was what is used. 5. One will be given in the next. 6. Try thirty grains to the ounce. 7. Collodion for the wet-plate process. 8. The wet-plate process as given. 9. Same as for dry plates. 10. Not so good as spirit varnish. 11. Yes. 12. Chase Side, Southgate, N. 13. We cannot say; it is almost unlimited with suitable arrangements. 14 and 15. Not that we are aware of. 16. We have no intention of doing so.



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## EX CATHEDRÂ.

THE *Strand Magazine* for November should be of especial interest to all photographers, for it contains a readable paper by Sir Robert Ball on "Great Showers of Shooting Stars," suggested by the approaching meteoric flight timed to occur between the 14th and 16th of the present month. Sir Robert refers in a readable manner to the peculiar characteristics of these interesting phenomena. In another part of this week's JOURNAL we reprint a paper by Professor Pickering, of Harvard University, dealing with the photography of the subject, which we commend to the notice of those of our readers who intend pointing their cameras towards the sky at the time when the meteors are expected to appear.

\* \* \*

SIR ROBERT gives, in the *Strand*, a graphic account of his observations of the display of shooting stars in November, 1866, but it is to Professor Lewis Swift, of Lowe Observatory, California, that we are indebted for some impressions of the shower which took place in the year 1833. This shower, says the Professor, far surpassed the others, if not all that history

records, in the brightness and number of the meteors seen. Professor Swift adds: "I was a boy not yet fourteen years of age, but the memory of that, awful night clings tenaciously to me yet. I am not going to even attempt to describe the wondrous scene, for the most gifted pen would fall far short in describing it. They fell like flakes of fiery snow in a moderate snow storm. It is estimated that at least 200,000 were seen from any one point, and this all the way from Greenland to Patagonia. I noticed that they appeared all over the sky, bright and faint, with short and long train, but was too young to observe it scientifically, and failed to notice that the trails, if traced backward, would meet at a certain place like the spokes of a wheel. Not one was seen to reach the earth, though many were very bright. The sky was perfectly clear, and the moon absent. It was a rain storm without a cloud, lightning without thunder. What made the deepest impression on my youthful mind was the deathlike silence above and around me. Seeing such a display of energy going on, and hearing no noise, the silence was as depressing and solemn as in a room of the dead."

\* \* \*

WE are informed that some time ago an application was put in at the Trade Marks Office for the registration of the word "Pakko" as a general name for photographic papers. This has now been refused by the Registrar on account of its similarity to existing names. Kodak, Limited, opposed the application on the ground of the likeness of the word Pakko to the well-known Eastman papers, Nikko and Dekko, and because the word could very easily be transposed into "Kopak," and this opposition has been upheld. The application for the registration of the word "Pakko" was made in all the photographic classes, namely, Nos. 1, 8, 15, and 39, and was refused in all. Similarly the application to register the word "Simplicio" for a photographic paper has been withdrawn in view of the opposition on the part of Kodak, Limited, the word "Simplicio" being likely to cause confusion with the registered trade mark, "Solio."

\* \* \*

THAT the advisability of securing photographic records of matters of interest is now acknowledged was shown at the last



Council Meeting of the National Photographic Record Association, when it was announced that societies were now at work in Warwickshire, Somersetshire, Leicestershire, Rutland, Rotherham, Birkenhead, and that the work had been taken up at Croydon, Redhill, Herefordshire, and other districts. 100 prints were presented by the President, Sir J. Benjamin Stone, M.P., of matters of interest in Lincoln, Shrewsbury, the Rock dwellings in Staffordshire, &c.; by Mr. T. W. Sharp, of some valuable records of the excavations now being carried on near Glossop; by Mr. P. Rudge, of some of the old crosses at Iona; by Mr. E. Scamell, old houses in the Strand, &c.; and by the Hon. Secretary, Mr. George Scamell, of various old churches at South Mimms, Pinner, Aldenham, &c., and of a series of views of Christ's Hospital.

\* \* \*

At a recent meeting of one of the London photographic societies a member is reported to have expressed "surprise that photographic chemists had done so little to place methods of combined toning and fixing upon a scientific and definite basis. A perfect understanding of these methods was a thing to which he looked forward with a keen interest, and he hoped that some steps would soon be taken to compass the end he had in view." One would have thought that little remained to be said on that subject by chemists. It was duly investigated by Hardwich more than forty years ago, and again by modern photographic chemists, Bothamley and others, since the system of toning and fixing has been reintroduced, also many articles on it have from time to time appeared in our columns. Evidently the gentleman who made the above remarks is not a very diligent reader of photographic literature.

\* \* \*

We may say that all the investigations made by chemists ancient and modern, prove that the system of combined toning and fixing is a very undesirable proceeding, as regards the permanency of the prints, unless certain conditions are carefully carried out. These, unfortunately, are too often ignored by workers, either with the view to economy or saving of trouble. The latter appears to have been uppermost in the mind of the gentleman who brought the matter forward at the meeting just referred to. We are sorry to observe an increasing tendency at the present time to save trouble, often quite regardless of the after-consequences, particularly amongst amateurs, notwithstanding that everything is now supplied by the manufacturers ready for use. How different from the time when the users, whether professional or amateur, had to prepare everything for themselves! It would be interesting to know how many amateur photographers there would be at the present time if that condition of thing now existed. Not more than there were a quarter of a century ago, we trow.

\* \* \*

THE County Council has been stayed, for a time at least with regard to Rutty's House in the Bromley Recreation Ground. In the report of the Council's meeting last week, the Parks Committee recommended that the house should be cleared away. In the discussion on the subject, one of the Council pointed out that the house was an interesting specimen of the period of William and Mary, and said that the Council's register of historic buildings should be, if that house was demolished, a register of historic houses to be demolished (hear, hear), adding that, if they took away that house, they would take away the last building of interest in the district,

and leave nothing but the shoddy over it. This remark was again greeted with hear, hear. Finally he said the only use the Parks Committee seemed to think ground could be put to was either for a bandstand or a gymnasium. Another Councillor said that the real name of the house was Tudor House, and that it was in good condition till it came into the hands of the Parks Committee. In the result, by a vote of 60 to 41, the Parks Committee had their recommendation referred back for reconsideration. Hence Tudor House is not to be demolished just at present.

\* \* \*

VANDALISM seems to be a rather prevailing idea with the County Council as at present constituted, but it must be borne in mind that, in some crowded neighbourhoods, ancient buildings, though of high historical interest, "cumber the earth," and their removal becomes a necessity in order to make room for far more utilitarian edifices; but this certainly does not apply to Rutty's House in the Bromley Recreation Ground, as it only occupies a small space in it. Particularly is this the case when it is considered that the Vicar of Bromley has offered to rent the house for a branch of the University Settlement, an excellent purpose to put it to. Vandalism, as we have just said, seems to be rampant with a certain section of the County Council, and we all remember how it was proposed some little time back to despoil Hampstead Heath, the most beautiful spot within many miles of London, by laying it out with the Council's symmetrical, orthodox gravel paths until it was prevented by the opposition of the public generally.

\* \* \*

WITH reference to our paragraph on the work of the Photographic Record Association it seems a pity that, as the older and interesting portions of London are so fast disappearing, metropolitan photographers do not keep the thing more in mind than they do, and secure photographs while the places are intact. Often the buildings are in the course of demolition, or scaffolding is in course of erection preparatory to it, before they are aware of the fact. Hence many pictures are lost, or have to be taken with the condemned buildings disguised with posters and hoardings.

\* \* \*

At the Mansion House Police-court, one day last week, a man was summoned for carrying a notice by way of advertisement on a motor car. The car, it appeared, belonged to a firm of "tipsters," and contained a notice-board advertising —'s "finals." There was also a wreath of ivy with the word "Irish" round it, symbolical of the tip for a race that day, and it was employed to deliver the finals at the different offices of the company. The solicitor for the defence contended that the car was not an advertisement within the meaning of the Act, but was simply employed for business purposes, delivering the tips, and put in photographs of it to prove his contention. The photographs, however, did not help his case in this instance, for in the end Sir Horatio Davies, who presided, inflicted a fine of 5s. and costs. This is the first time that we remember photography being utilised in defence of a case of this kind. We strongly suspect that it would have told better if it had been employed as evidence for the prosecution. Possibly it may be in similar cases in the future.

\* \* \*

WE are glad to note that the Society for Checking Abuses of Public Advertising is having considerable success. The



Building Act Committee of the London County Council have recommended the prohibition of offensive signs, and in many places the Society has obtained the concessions it desired. The North Eastern Railway Company has commenced to remove some advertisements which were considered unsatisfactory.

### ATMOSPHERE

"PLAYS in its time many parts," many of them closely applicable to photography or photographic techniques; and just as we observe, when reading the meteorological forecasts in the daily papers, if photographers do read them, the varying conditions of the weather in different localities, usually wishing it different for our own district, so do we find the atmosphere more or less to our mind as it dwells upon photography either ethical or technical. Thus we have the moral atmosphere, the utter absence of which in some of the advertisements in the "Wanted" column was recently violently inveighed against by a correspondent who is justifiably severe on the "open scandal" of advertisements for "specimens for show-cases." Then there is the "atmosphere of doubt," which too often envelops us when the tyro, with only a month or two's experience, exhibits a magnificent enlargement "entirely my own." Then, again, there is the atmosphere of the Salon, of Egyptian Hall notoriety; but, as we always desire to preserve a healthy tone in our artistic perceptions, our tendency is usually to free ourselves of its influence as quickly as possible. Hence we would at once abandon the abstract, and apply ourselves to the concrete. In doing this we are reminded of a purely physical aspect of the atmosphere which was lately suggested to us.

A very mysterious discolouration of several batches of P.O.P. was recently brought to our notice. The first batch so discoloured, after being only a month on stock, was indignantly returned to the manufacturers, who, dealing with an old customer, exchanged it for a fresh supply. When, however, the same complaint was made against the substituted batch, they declined to recognise the justice of the complaint. Very angry, the photographer gave his custom to a rival firm, but, when his new supply exhibited the same objectionable tendency, our intervention was solicited. Not to make too long a story of the matter, we may narrate the sequel—not arrived at without considerable trouble. All these batches of paper had been kept in a dry, cool cupboard, which had been used for years for the same purpose, and so might be considered free from suspicion. Yet the evil arose from no other direction. The cupboard was situated in a recess in a wall that separated the room from another in which waste hypo was kept, and which was precipitated every few days by the usual liver of sulphur method. Careless printers had so slopped the hypo about that it had soaked into the wall, and disintegrated the mortar to such an extent that some of the bricks fell out, and this, happening behind the residue vats, remained unnoticed from the printer's side, and, being close to the floor, was invisible from the cupboard side. It will be readily seen that sulphuretted fumes would be given off whenever the oil liquid was drawn off, and would diffuse into the cupboard, pass into the P.O.P. store, and naturally discolour it.

We do not suppose that a similar accident is likely to occur elsewhere, but the whole affair is such a valuable object-lesson that the manufacturer of paper or plates should not be too readily blamed for supposed imperfections. No doubt they

could tell us many a similar story of injured innocence. It is not twelve months since we were witness of such a case where plates were returned owing to sulphuration of the surface. Here the case was simple enough—another cupboard for storage, but of such a size that, after long use otherwise, it was determined to light it up with gas. Being a cupboard, with little ventilation, the products of combustion remained a long time in the place, and it can easily be seen that the slight amount of sulphur compounds that are thrown into the atmosphere when some of even the best kinds of coal gas are burnt would inevitably diffuse through the box and coverings of the plates, and as inevitably produce the familiar iridescence upon developing.

Here we may note that it does not appear to be generally known how to get rid of this annoying defect. It can be done with perfect ease, and care being taken, without injury to the negative by flowing it over, when all the hypo is washed out, with a solution of ferridcyanide of potassium of about two per cent. strength. We may point out, too, that this remedy is equally efficacious for the removal of green fog. It must be understood that we are not referring to the Howard-Farmer reducer, though the principle of action is analogous in some respects, for no hypo whatever is to be used except in cases where the image is almost hidden by the iridescent or the green-fog stain.

We are arriving at a time of the year when the atmosphere exhibits another aspect of a troublesome nature. Mr. Cadett recently pointed out how many workers objected to thick films on account of the slowness of fixing in the hypo. There is, however, no doubt that some of the best plates in the market have thick films, and we know many first-rate photographers who will not look at a thinly coated plate. With such plates slow fixing is concurrent with slow drying, and at this season of the year, unless a good supply of artificial heat is available, the atmosphere is often, through cooler temperature and increased hygrometrical condition, incapable of taking up the moisture from the plates, with the effect that occasionally they may take almost a couple of days to dry. Where speedy drying is important, the plates should be wiped both on film and glass side to get rid of all the moisture possible to throw as little work on the atmosphere as possible. In this connexion we may say that a correspondent speaks most highly of an electric fan which he has had fitted up for drying purposes.

We had intended referring to the atmosphere from a pictorial standpoint; but, as already our article is unduly expanded, we must leave that aspect for treatment on some future occasion.

**X-Ray Notes.**—At a recent meeting of the Paris Academy of Sciences, MM. Abel Buquet and Victor Chabaud gave a description of a new vacuum tube they had devised for preventing the anticathode from getting heated, this being an effect which, as is well known, greatly interferes with radiographic work. Their method is to fuse the platinum tube forming the anticathode directly to the glass, and to keep it cool by surrounding it with cold water. This is very probably the tube advertised and illustrated by Messrs. Isenthal, Potzler, & Co., the water and the platinum being enclosed in a kind of secondary bulb fused to the main bulb. Such an instrument should be exceedingly useful when using the powerful currents rendered available by the Wehnelt electrolytic break, though it is rather singular to find, as we have done, two expert workers holding diametrically opposite views as to the heating of the anticathode. One informed us that he always worked with the platinum red hot, while the practice of the second was to keep it quite cool by making the contact-breaker work so slowly that its beats could almost be counted.



**A New Metal.**—We have already brought before our readers the discovery of two new metals, polonium and radium, which possess the most extraordinary radiating power, very many times more intense than the uranium ore from which they are extracted, and now we learn that, at the meeting above referred to, M. A. Debiérne described still another metal which he had isolated from pitchblende, and which possessed a radio-active intensity 100,000 times stronger than that of uranium. The new metal, which, by the bye, has not yet received a name, resembles titanium very closely, and is not spontaneously luminous. The rays are capable of acting upon dry plates, and exciting the platino-cyanide of barium screen.

**Tele-photography.**—The popularisation of any new scientific instrument is often signalised by the publication of an article upon it in one or other of the popular magazines of the day. This we note has been done with regard to the tele-photographic lens in *Scribner's Magazine*, a series of photographs by Mr. D. L. Elmendorf being reproduced. They exhibit a wide range of experience, from Jungfrau within a few hundred miles from us to Popocatepec at the other side of the globe. There is little doubt that when the instrument is better known it will become of far more common use; for though it is justly said that, in this country at any rate, the atmosphere is not often clear enough to take photographs of objects many miles away, the lens is most usefully available for comparatively near objects which it is required to photograph on a far larger scale than other existing lenses are capable of achieving.

**Photographing the November Meteor Shower.**—The Meteor Section of the British Astronomical Association asks its members who wish to take part in the photographic observation of the November meteors to send in, without delay, their names, with full particulars of their photographic equipment to the Director of the Section, Mr. R. Wilding, F.R.A.S., Swillbrook House, Burke, near Preston, Lancashire. We have no doubt he would welcome efficient aid from readers not members of the Association who would like to join in the work.

**Peculiarities of Indiarubber.**—*Engineering* recently had an interesting review of some of the properties of indiarubber which will appeal to some of our readers. Any one who has had occasion to use indiarubber gloves or mittens to preserve the fingers from the injurious action of chemicals—bichromate of potassium, &c.—and has laid them aside for a while, knows how frequently they have become “perished” and useless, while when kept in constant use they seem almost everlasting. Some clue to the cause of this is given in the article. The sulphur used for vulcanising absorbs oxygen from the air, becoming converted into sulphuric acid, and this is known to be injurious to rubber. Naturally, when the gloves are in use, any acid formed is taken up directly by the liquids the gloves are immersed in. A plan often recommended for storing such articles when not in use is to keep them immersed in ammonia water. We cannot yet speak from personal experience of the efficiency of the plan, but we do know something to effect the purpose in view is highly desirable, for, quite recently an accident having happened to a pair we had had in use for some years, we took from a drawer a second perfectly new pair, which we had kept by us ready for an emergency. The first glove we put on tore in two pieces in the mere act of drawing it on!

**Another Royal Picture from Photographs.**—The German Emperor William has commissioned a German artist, Professor Knockfuss, to paint a large picture of their Majesties' ceremonial entrance into Jerusalem last year. We read that all the members of their suites that were present on this occasion have been photographed in the large court of the Foreign Office at Berlin. The artist will therefore have photographs of all the persons to work from so that the likenesses may be preserved. It will be interesting to learn if he will also have photographs of the surroundings, the gates, &c., to help him in his work; also, if this is the case, whether

they were taken before the event or at the time, because we read that, before the visit, the gates were renovated and embellished and somewhat modernised, as has been done on other occasions on important visits to Jerusalem, so that the gates, we are told, are widely different from what they were originally, and more is the pity. If the picture is painted from photographs taken at the time of the visit, it will not depict the gates, &c., as they are shown in photographs of them as they originally were, and there are plenty of them in existence.

### JOTTINGS.

WAR on a scale as large as that now being waged against our Brother Boers makes busy other people besides steamship companies, army contractors, and the usual furnishers of those supplies which a great movement of troops always renders necessary. The photographic trade and professional photographers have had their share of the money that has been publicly and privately spent during the past weeks in connexion with the present campaign. I have heard in the trade that very large orders for apparatus and material have been executed for South Africa; and several London and country photographers have told me that they have been called upon to produce great numbers of portraits of officers and men going out to the war—and of the girls they are leaving behind them. No doubt a great deal of photography will be done on the battlefields and whilst General Buller is completing the work of subjugation, annexation, or whatever is to follow the victory of the British arms; and thus the home trade may be expected to be kept busy for a considerable time to come. It is an ill wind that blows nobody any good! I suppose the Crimean War was the last occasion when so many troops left this country; but in those days photography had barely emerged from the Daguerreotype stage into that of the wet collodion, and could not have been utilised to the extent which is possible to-day. There were no hand cameras, highly sensitive gelatine plates; rapid shutters, pocket Kodaks, or cinematographs in the “early fifties.”

Those readers of the JOURNAL who passed over the Society news published on October 13 missed an item of great curiosity and interest. On page 654 the President of the Cornish Camera Club is reported to have suggested that members should investigate in the coming year “the curious fact that, given the same material and circumstances, one man could get good results, while another man got only unsatisfactory results.” No more novel subject could be suggested for a Society discussion, and besides the element of novelty it also possesses that of fecundity, for you could include in the discussion such items as heredity, individuality, opportunity, application, and the many other influences which unite to make one man different from another; and then, when the matter had been thrashed out to its uttermost how much wiser should we be? We have the fact before us that in all the main walks of life, let alone the little side-walk of photography, equal opportunity and (as far as it can be defined) equal ability do not make one man as successful as another. You can discuss the fact for centuries, but you will never alter it. After all, if everybody got equally good results in photography, how very monotonous photography would be, to be sure.

A few weeks ago I drew attention to the fact that the editor of the *Photo-American* had published an attack on the qualities of British-made photographic apparatus, which he erroneously suggested was inferior to the American productions. Since then he has indulged in a further outbreak of Anglophobia, the nature of which can be seen by the following extract: “All, or nearly all, of the English photographic journals have announced that the owner of the *Shamrock* has taken a camera to this country to secure views of the yacht race, and, oh, delicious morsel! how it has been mouthed and tasted over and over, the plates are to be sent back to England, in order to obtain the best results. If the Britons can develop plates better than we (which, of course, I am perfectly willing to wager they cannot), they are not living up to their reputation for generous and fair dealing in crowing so over Sir Thomas Lipton's decision in the matter. If they



suspect that they cannot, why, that's another matter, and no one will blame them for their wild, boyish enthusiasm over the fact that they can say a whole lot about it, any how. I've heard it said that the English people make a very great many *reversed negatives*."

The tone of this extract is not in the best of taste; and the whole deliverance is quite uncalled for, the "crowing" to which the writer refers being merely a figment of a too active imagination. I have met scores of travellers from America in this country who have brought American-made plates with them, and have preferred to develop them on their return home, in the hope or the belief that, by working amidst their accustomed surroundings, and with the developers most suited for the make of plate used, they would secure the best results. Nothing in the world could be more natural; but no British writer would say stupid things on that account. I do not suppose that a war between the United States and Great Britain will break out because I have called attention to the fact that an American journalist is "down" on British apparatus, plates, and developing abilities; but I suggest to the writer that his remarks do no credit to the common sense or dignity of American photographic journalism. Great Britain has sent a deal of money to the United States for photographic material in the last fifteen years, and, if American photographic journalists are incapable of being grateful for this, they might at least be civil.

Crooke *versus* Guerin is the title that might be given to a little controversy which lately made its appearance in the American journals. It may be remembered that, in his Presidential address to the Convention, Mr. Crooke expressed the weighty opinion that there is at present a marked appreciation of high-class pictorial portraiture, and that the men who produce it will be sought after. Almost simultaneously with the utterance of this opinion, the President of the American Convention, Mr. Guerin, was singling out for praise and recognition "the photograph entirely deficient in art principles, if it is only perfect in chemical and mechanical manipulations." In other words, the nominal, if temporary, head of American professional photographers was advocating the production of the "usual thing," the machine-made photograph of the show-case, in preference to work which relies upon its artistic or pictorial qualities for acceptance at the hands of the public.

According to a book of *American Photographic Studies* in my possession, and in which some of Mr. Guerin's work is reproduced, that gentleman is one of the most successful photographers of children in America. But Mr. Guerin's work, though pleasing and pretty, and probably remunerative to him, does not rise above the level of the usual thing. Most likely he is a man whose ideas on the possibilities of photographic portraiture were long since fixed beyond qualification or modification, and this condition of things operates to place him out of touch of modern tendencies. Even so, this does not lessen the force of his views, although it may discount them. It is not far short of a calamity that in these days a defence, if not a laudation, of the "usual thing" in photographic portraiture should emanate from a man who is placed in the position of guide and teacher of his younger brethren. Surely the mechanically perfect portrait is a false, if not a low, ideal to pursue; and, besides, is not the educated public, all the world over, showing an inclination to reject this sort of thing for work which is the outcome of a "more subtly suggestive style of treatment?" to borrow a phrase from that mine of quaint and curious remarks, the *Salon Forewords*.

Of the two photographic leaders—Crooke and Guerin—my money goes on Crooke. That kind of portrait photography which takes advantage of the illimitable resources of lighting and posing, of simple composition, and of the utmost capacity of the lens and dry plate for translating the characteristics and beauties of the human face and figure, the most delicate gradations of light, shade, and texture, and

calls in the best obtainable aid of the discreet retoucher and the photographic paper-maker—pictorial portraiture, in fact, is only just commencing to receive public notice and appreciation. The productions of such workers as Mendelssohn, Crooke, Barnett, Hollyer, Harold Baker, Histed, Fellows, Wilson, Joseph Thomson, Alice Hughes, and others I could name, are nothing like so popular or appreciated as they deserve to be, for the reason that the public at large has had little or no opportunity of knowing the kind of work these photographers produce. The great middle class has still to realise that "egg-shell" or "billiard-ball" portraiture is not the best that photography can do for them, while, as for the masses, they never see anything of a higher grade than the show-case three for-two-and-sixpence kind, and cannot therefore be expected to reason out portrait possibilities for themselves.

I am writing these lines as the result of a study of portrait photography in all the large towns of Great Britain. Where the very best work is shown, it always secures appreciation and patronage, provided those who produce it are men of business. I refuse to believe that an educated, art-loving public will long continue to accept the machine-made portrait which Mr. Guerin exalts, and which is so prominent in this country as well as his own. The public taste is ripe for something higher and better. The days of the usual thing in portraiture, I am convinced are coming to an end, but photographers require to be educated up to the possibilities of pictorial portraiture. I wish, in place of the one or two verbose and shallow-minded persons who stump the country with pictorial—i.e., landscape photography—for a text, it were possible to substitute one or two cultured and willing men, who could travel about opening the eyes of photographers as to what can be and is being done by the best men. Illustrated periodicals and exhibitions are perhaps having a strong salutary influence in the matter; but the spoken word and the illustrative example are far more potent in effect.

However, to descend from dreamland to workaday actualities: there is no doubt that a growing tendency towards better things in portraiture is manifesting itself in this country more and more as time goes on. Against the Guerin deliverance I will set a piece of advice which I lately heard a distinguished portrait photographer give to a young aspirant, "Study good pictures and try to produce something like them." Yes, there's the pith and marrow of the whole thing—study! I was much struck by the spirit of a rising photographic friend who lives 500 miles from London, and who recently spent a few days in London—the first time for years. Every minute he could spare, amidst the distractions of this great and gay city, he was "studying good pictures" in the National Gallery and elsewhere. And he is at home now trying to produce something like them. I am quite confident he will. COSMOS.

#### PHOTOGRAPHING THE NOVEMBER METEORS.

PROFESSOR W. H. PICKERING, of Harvard College publishes in the current number of *Popular Astronomy*, the following hints on taking photographs of the approaching star showers on November 14th—16th next:

The meteors may be photographed either with or without clock-work, the stars appearing either as dots or lines. There are three reasons why a camera may be advantageously attached to an equatorial mounting and driven by clockwork. First, many more stars will be photographed than if they are allowed to trail. Secondly, if the image of the star in the finder is occasionally examined, and the telescope adjusted so that round stellar images may be obtained, greater accuracy in right ascension will be secured. Thirdly, if the meteor photographed is not observed visually, that fact is of little consequence as far as a determination of the location of the radiant is concerned, if the instrument is provided with clockwork.

Since the radiant is constantly, although slowly, changing, it is



desirable, even with clockwork, to know the approximate time at which a meteor appeared. It is therefore recommended that the plate be changed at least as often as once an hour. Since the moon is nearly full, it is possible that still shorter exposures will be necessary, in order to avoid fogging the plate in case a portrait lens is employed. Another but less satisfactory remedy would be to stop down the lens. It is well to carry on visual observations at the same time including drawing the path of all meteors of the second magnitude or brighter appearing in the region covered by the map.

The camera should be attached to the outer end of the telescope tube instead of to its middle, as might at first seem more convenient, as otherwise the edges of the slit in the dome are liable to interfere with the view. If the slit is wide enough or an outdoor equatorial stand is available, several cameras may be attached to it pointing to different portions of the heavens.

In every case, however, the radiant should fall upon the plate. With two cameras it is recommended that the radiant should fall near the middle of the northern edge of one plate and near the middle of the southern edge of the other. With three cameras, two should photograph the region preceding the radiant, and one that following it, since early in the evening more meteors, which are nearer and therefore brighter, precede the radiant than follow it.

Since the ordinary bellows camera is only intended to be used in a horizontal position, its joints should be thoroughly braced before it is attached to the telescope, otherwise we shall find that the distance from the lens to the plate will vary with the altitude, throwing the images out of focus. In order to test the matter thoroughly, photographs should be taken at various altitudes with slight changes of focus several nights before the shower. A few long exposures should then be given at different altitudes on some point having the same declination as the radiant, in order to determine if the axis of the photographic lens remains at a fixed angle with that of the telescopic finder. This is a matter of the highest importance, and is very liable to give trouble unless the camera is firmly lashed to the telescope, and the finder is fitted securely. The plates should all be numbered in the corner, on the film side, with a soft lead pencil, or, better still, in copying ink.

If only a few meteors are photographed, as will be the case upon the nights immediately preceding and following the shower, it will be very difficult for any single observer to secure a satisfactory determination of the location of the radiant. By combining his results, however, with those obtained at other observatories, much more satisfactory results may be obtained. For this reason it is desired that all original negatives showing meteors taken during the present shower may be forwarded to this Observatory at its expense. They will then be examined, measured, and returned to the senders, if desired. If it is not practicable to forward the original negative, a glass contact print from it would be the next most desirable record, or a print upon a flexible film, which may be sent by mail.

A single bright meteor, if photographed from two or more stations suitably located, would furnish all the material necessary for a determination of the radiant. These stations might be, in general, from ten to forty miles apart. For photographic observations of parallax the lesser distance would probably prove the more satisfactory, and one station should be nearly north of the other.

We will now discuss the best method of photographing the meteors when an equatorial mounting driven by clockwork is not available for the support of the camera. It is thought that, if the following suggestions are carefully carried out, the results obtained will be but slightly less accurate than those secured by means of clockwork. They will certainly be far more reliable than those secured by the most skilful astronomer who trusts solely to visual observations.

The best lens to use for this work is undoubtedly a large, old-fashioned portrait lens, but it may well be supplemented by a wide-angle lens, the radiant being central in the field of each. A very convenient and simple form of camera consists merely of two rectangular wooden tubes, one sliding inside of the other.

These should be blackened upon the inside. The lens is attached to the outer tube, and a suitable frame to hold the plate-holder fastened to the inner one. If these tubes are well fitted, once they are properly focussed, four screws may be driven into them, holding them firmly together, and they will remain immovable, regardless of the angle they make with the horizon. A simple form of equatorial mounting consists in attaching the camera so as to point upward from a base, at a fixed angle of  $22^\circ$ , equal to the declination of the radiant. The base is pivoted to turn upon a board placed parallel to the equator. A series of holes, in any one of which a peg may be inserted, serves to adjust the angle in right ascension to any desired hour angle. By this device considerable time is saved in shifting and pointing the camera or cameras (*Harvard Observatory Annals*, vol. xli. p. 147). If a bellows camera is used alone without any accessory mounting, it had best be firmly attached to a board, which can be inclined against a box at a suitable angle.

The quickest method of focussing the camera is as follows: Focus by daylight on some distant object, mark the focus on the camera, push the lens in about two millimetres, and point on some bright star at night by sighting along the edge of the camera. Expose the lens for thirty seconds, and then, without moving the camera, lengthen the focus one millimetre. Expose again, and so on for five exposures. Let the last exposure have one minute duration to distinguish it from the others. On developing the plate, it is probable that nothing will be seen until it is finally fixed, and can be examined in a good light. Then five short lines will appear, due to the motion of the star in the heavens. The best focus can be interpolated from among them. It is well to point in some region of the heavens containing several bright stars, such as the constellation of Orion, for, since the focus varies in different portions of the plate, a better selection can thus be made.

Each time before exposing the camera, on the night of the shower, it should be set by sighting along its edge, so as to point at  $\epsilon$  Leonis. Owing to the motion of the stars, this will bring the radiant near the centre of the plate at the middle of the exposure.

On account of the length of the star trails, it is better that the exposure should not exceed one half hour in duration. The exposures should be closed exactly on the hour and half hour, which, allowing for the time required to change the plates, will make the exposures a little short of thirty minutes. A brief exposure of two seconds should be given just before and after the long exposure. The time of these exposures should be taken with the greatest care in hours, minutes, and seconds, and also the time that any bright meteor crosses the field of view of the lens, as the difference between these times gives the right ascension of the radiant. The course of the meteor should then be drawn as carefully as possible upon the circular map, and finally a description of it given as previously described.

The chief error affecting this method of observation consists in noting the time that the meteor crosses the field of view. This error may, it is found, readily amount to many seconds. By the use of a chronograph or a stop watch the difficulty is largely avoided. In default of those instruments, the error may be greatly reduced if an assistant will keep his eye steadily fixed upon his watch, while the observer fixes his on the sky. The instant a bright meteor is seen crossing the field of view of the lens the observer calls "tip," and the assistant records the time. Being relieved of the necessity of looking at the watch, the observer can, moreover, make his other records with much greater accuracy.

If but few meteors are seen, it will not be necessary to change the plate at each exposure. In the case of the wooden equatorial mounting, any slight inaccuracies in fixing the board parallel to the plane of the earth's equator will cause successive trails of the same star to deviate from one another. If the various exposures differ among themselves by ten or twenty seconds, the corresponding differences in the lengths of the star trails will be quite marked. There will therefore be no difficulty in determining which set of star trails correspond to the trail of the meteor. It is recommended, however, that not more than three or four meteor trails be allowed to fall upon any one plate.



## THE HISTORY OF OPTICAL GLASS.

[Translated from "The Theory and History of the Photographic Objective" by Dr. M. Von Rohr.]

THE manufacture of optical glass could only attain importance when, in consequence of the development of optics, telescopic objectives of greater dimensions were found to be a necessity. The most important step in this direction was the achromatising of telescopic objectives in which John Dollond succeeded in the year 1757. The two kinds of glass, crown and flint, which were now to be made in larger discs, offered great and separate difficulties in the art of melting, in so far as, towards the end of the last century, pieces of somewhat greater dimensions were obtainable from crown, but not from flint, glass. We may observe that the melting of optical glass differed in no way from that of ordinary glass, the whole proceeding consisting essentially in selecting the pieces fit for optical instruments from among those prepared for other trade purposes. Thus does G. Bontemps describe—and, in this instance, free from prejudice—the attempts made by the glass-manufacturer, D'Artigues, who supplied material to the optician, R. Cauchois.

By this method, however, but very small discs, 8–11 cm. (3 to 4 inches), were produced, and even these could not be guaranteed. The difficulties to be overcome in the production of comparatively thicker pieces as, for instance, the Chevalier prisms, have already been treated of in a former chapter.

The first who directed his attention to the making of specially optical, or, more correctly, flint glass, and thus paved the way for the necessary differentiation in the melting industry, was the watch-maker, Pierre Louis Guinand (born, 1748; died, February 13, 1824), of les Brenets, a little place on the French frontier, in the present canton of Neuchâtel. How this man happened to hit upon the idea of glass-melting, which lay so far out of his own department, and who, according to G. Bontemps, carried it on as a clever amateur without any technical knowledge, it is impossible to say. His attempts, which extend back to the year 1775, did not, however, prove very successful, as may be inferred from the communication of the optician, Rochette, and the astronomer, J. de Lalande, contained in a letter of Aimé Guinand, the son of P. L. Guinand.

According to this same source, negotiations began in 1804 with the Bavarian national economist, J. Utzschneider, by whom P. L. Guinand was invited to send samples of glass to Munich for examination, J. Utzschneider being in want of a capable technologist for the proposed enlargement of the Liebherr works, which he intended developing into a mathematical mechanical institute. Whatever the result of the examination was has remained unknown. In any case, a meeting of the two parties was arranged, and took place in Aarau between J. Utzschneider and the two Guinands, the former giving an order in January 1805 for a sample melting of flint glass at his own expense. The result of the examination of this and other glass ended in the removal, in September 1805, of Guinand to Benediktbeuren. In the two accounts to hand we meet with a contradiction in so far as J. Utzschneider, in his obituary on J. Fraunhofer, represents P. L. Guinand as a melter of limited ability, on whose engagement he had not definitely decided at the time of the meeting in Aarau. According to A. Guinand's account, his father's removal to Benediktbeuren took place entirely at J. Utzschneider's personal solicitations. However this may be, it was only in February 1807 that a contract, for the space of ten years, was closed with P. L. Guinand, by which he was to receive a fixed salary of 1600 florins in gold,\* and to live free of rent.

The interval, from the autumn of 1805, was filled up in the building of a glass manufactory and the preparation of preliminary meltings. By the terms of his agreement, P. L. Guinand had bound himself over to disclose his secret to J. Utzschneider, and to any person named by the latter. This secret, no doubt, consisted in the stirring of the crucible with a rod composed of crucible clay, though on this point we can give no positive affirmation, this artifice being looked upon as a trade secret, and no account of P. L. Guinand's acquirements, or of the improvements introduced by J. Fraunhofer appearing ever to have been published separately. The meltings at first carried on in J. Utzschneider's presence presented two deficiencies; the glass was full of striae and the refractive indices of the different pieces varied according to their position in the pot. Only by using carefully selected crown and flint pieces was it possible to supply the necessary objectives to measuring instruments, which were ready-made as far as the brasswork was concerned. We are therefore not surprised that this result did not come up to J. Utzschneider's expectations.

Meanwhile (in 1807) J. Utzschneider being again called into the service

\* Notwithstanding all my endeavours, I have been unable to ascertain the value of the sum in modern money, the standard of coinage in South Germany at that time being apparently unknown.

of the State, and no longer able to devote his whole attention to the glass manufactory, initiated J. Fraunhofer into the secret, and even intrusted him, in September 1811, with the task of producing flint glass in conjunction with P. L. Guinand. At the second melting J. Fraunhofer obtained glass free from striae and homogeneous through the entire pot, without, however, securing complete certainty, for later meltings were again unsuccessful. It was only two years afterwards when he discovered that, in order to guarantee good quality, he must use larger pots—of four, instead of two, hundredweight capacity.

Some time later (on December 6, 1813), P. L. Guinand gave notice to leave, and in the beginning of the next year, after a sojourn of eight and a half years, left Benediktbeuren, under the stipulation of abstaining from any active part in glass manufacture on payment of an annual compensation of 800 florins.\*

According to concurring accounts, he undertook the management of a new glass manufactory in 1816, thereby losing his compensation, but making an offer, as we are informed by J. Utzschneider, to return to Benediktbeuren, an offer, however, which was not accepted. In his glass works he produced, according to his son's testimony, discs for objectives of 33 and 35 cm. (13 to 13½ inches) diameter, which were bought by N. J. Lerebours and R. Cauchois. Later on he entered into correspondence with the London Astronomical Society, and also with the French Government; the negotiations, however, fell through, and P. L. Guinand died on February 13, 1824.

In Benediktbeuren J. Fraunhofer continued to work at the production of optical glass, and, according to J. Utzschneider, obtained better glass, and with more certain results, than P. L. Guinand had been able to do in 1814.

The largest telescope completed under J. Fraunhofer's supervision had a diameter of lens of 24.4 cm. (9.6 inches). The objective for the Bogenhausen telescope, with a diameter of 28.4 cm. (11.2 inches), was taken in hand during his lifetime, and the Merz firm, working upon his tested methods, found it possible later on to produce discs for objectives with an aperture of from 38.0 cm. (15 inches) to 43.4 cm. (17.1 inches).

But it would scarcely be fair to speak only of these successes concerning ordinary glass manufacture, J. Fraunhofer taking a far broader view of his task. Not content with having mastered the purely technical difficulties of ordinary glass-making, he originated the important idea of examining the influence exerted by the different components on the qualities of the ready-made glass.

In the first place, he tried to find out the connexion between the composition of the glasses and their liability to tarnish; and, in the second, he undertook the far more important task of systematically ascertaining the connexion between composition and optical qualities.

J. FRAUNHOFER'S GLASSES.

Kinds of Glass.	Refractive index for D.	Medium Dispersion $\nu = \frac{n-1}{\Delta n}$	$n-1$	Partial Dispersion.		
				B to D.	D to F.	F to G.
Crown glass No. 13	1.5290	0.00904	58.4	0.00367 0.406	0.00636 0.703	0.00557 0.616
Crown glass No. 9	1.5296	0.00920	57.6	0.00376 0.409	0.00647 0.703	0.00561 0.610
Crown glass Lit. M. (probably containing kali).....	1.5591	0.01081	51.7	0.00430 0.398	0.00767 0.710	0.00679 0.628
Flint glass No. 3	1.6085	0.01624	37.5	0.00645 0.397	0.01155 0.711	0.01073 0.661
Flint glass No. 30	1.6306	1.01799	35.0	0.00702 0.390	0.01288 0.716	0.01194 0.664
Flint glass No. 23	1.6337	0.01831	34.6	0.00709 0.387	0.01310 0.716	0.01208 0.660
Flint glass No. 13 (probably borosilicate flint).....	1.6350	0.01858	34.2	0.00729 0.392	0.01322 0.712	0.01203 0.648

In this aim, too, J. Fraunhofer was quite original, inasmuch as previously to him no one had ever been able to give the optical properties of the different glasses in exact figures. It was through his method of

\* The value of this sum was just as impossible to ascertain as that of the salary. Not even the proportion between the florin proper and the florin in gold—neither one nor the other then being a coin, but a simple unit for calculation—could be established.



using the dark lines on the spectrum that refractive index and dispersion could be correctly measured, and it was due to the same method that the disproportionate increase of the dispersion in crown and flint glasses became a certainty. Being himself a practical optician, he was fully conscious of the importance of glasses with proportionate increase, and, aware of this quality in combinations formed of a glass and a certain liquid, he cherished the hope of melting glass pairs superior in this respect to the old crown and flint. In order to give an idea of his results, I subjoin a table of his glasses in the form afterwards used by E. Abbe and O. Schott.\*

The pair best agreeing was Crown Lit. M. and Flint No. 13. The reason for giving up these promising meltings is very likely to be found in their fatal liability to tarnish.

To these promising attempts—the production of the new glasses in larger meltings not having, as it seems been arrived at—the death of J. Fraunhofer in 1826 was fatal; they fell into oblivion. Neither J. Utzschneider nor G. Merz and F. J. Mahler were capable as yet of developing the work of the gifted deceased, and the process of glass-making remained simply in the state to which Fraunhofer had brought it for regular manufacture.

Before we come to speak of the further development of the art of glass-making, it will be advisable to cast a look back on the merits of the two above-mentioned men, which seems all the more necessary as the accounts to hand evince a great spirit of partisanship, A. Guinand and G. Bontemps taking part for P. L. Guinand, and J. Utzschneider siding with J. Fraunhofer. Added to this is the objectionable habit, so often to be met with in men of different nationality, that he who can most detract from the merits of his foreign opponent is looked upon as the better patriot. In this A. Guinand, anxious to ascribe the world-wide fame of J. Fraunhofer's Optical Institution to the labours of his father, goes to the extreme. However human this may be, we must most distinctly declare that the results of the co-operation of several men can by no means be attributed to one alone. We shall be doing justice to P. L. Guinand when we ascribe to him the very happy idea of the suitable stirring rod, but the development of the process by which the success of the melting might be reckoned upon with some certainty appears essentially due to J. Fraunhofer; in any case, A. Guinand does not credit his father with this ability. Concerning, however, the plan of methodically improving glass in respect to the lessening of the oxidising influences and the removal of the secondary spectrum, this, in so far as it succeeded at all, must be ascribed to J. Fraunhofer alone.

Coming now to the further development of the manufacture of glass, the scientific treatment, as already mentioned, disappeared with J. Fraunhofer's death. The Optical Institution carried on the technical work as before, providing glass, however, for its own needs or those of the Merz firm only, and appears not to have remained behind the foreign productions. How great an importance we must attach to J. Utzschneider's personal influence may be inferred from the fact mentioned by E. Voit that a competitive manufactory was founded in the very year of J. Utzschneider's death.

The latter died on January 31, 1840, from the results of an accident, and in the same year the Munich banker, Ruedorfer, in Kohlgrub, near Murnau, founded an Optical Institute, with glass works, in which the meltings were carried on under the supervision of a workman formerly in J. Fraunhofer's employment. This Institute did not remain long in existence, owing to the want of scientific assistance required for the computation of the lenses to be ground from the ready-made glass. The glass produced there was made use of, up to the fifties, by the Munich optician, Baader.

Here we may still mention the attempts of the mechanic, Körner, in Jena, who, under the patronage of the Grand Duke of Saxe-Weimar, tried to melt flint glass between the years 1826–46; but his endeavours, which were directed towards the melting of ordinary flint glass only, remained without result.

Also C. A. Steinheil, as A. Safarik, on M. Perty's authority, reports, had set himself the problem of melting glasses with proportionate increase of the dispersion. For this purpose he himself had spectrometrically examined the different sorts of optical glass, and succeeded in interesting the celebrated J. Liebig to take in hand the chemical analysis of the samples. He was hoping by simple calculation to find out the proportion of the components in order to arrive, within certain limits, at the prescribed variation of the dispersive power; but, concerning these attempts, nothing has been published.

Georg Merz and, after his death in 1867, his son, Sigmund, continued to a certain extent J. Fraunhofer's attempts to melt glasses with proportionate increase of the dispersion. S. Merz's meltings of 1868 showed the influence of the percentage of lead on the optical properties, and in 1882 his published account gave notice of the result that proportionate dispersion could be obtained by infusing the right amount of lead.

This is all that is known concerning the art of glass-melting in Germany in earlier days. Nearly everything relates to J. Fraunhofer or to his successors or zealous imitators. Manufactories for the making of optical glass only, which had nothing to do with the grinding of the lenses, appear nowhere to have been in existence.

Far different was the fate of J. Fraunhofer's art in foreign countries, and first of all in the French-speaking domain. After the death of P. L. Guinand the secret remained in the possession of his two sons, one of whom, probably the elder, was the above-mentioned Aimé. The two separated, the elder becoming proprietor of a glass manufactory in the neighbourhood of Neuchâtel, which was carried on later by his successor, Theodore Daguet, in Solothurn.

The younger son entered into connexion with G. Bontemps (one of the Directors of the glass manufactory of Choisy-le-Roy), and the Parisian optician, N. J. Lerebours, working in conjunction with them according to his father's method of process; but, the information he imparted being found insufficient, the connexion was dissolved. Upon this, according to Sh. Muspratt's statement, the technical director of the glass works, Thibeau deau was drawn into consultation, and at last, in the year 1829, their joint efforts resulted in the production of glass discs free from defects, of from 32.5 to 38 cm. (13 to 15 inches) diameter. From this time forth, relying on G. Bontemps' account, we are able to speak of a regular manufacture of optical glass in France. This was taken up first by G. Bontemps and then by P. L. Guinand's youngest son, who, upon his death in 1851, was again succeeded first by his son-in-law, and afterwards by his grandson, Ed. Feil. The Guinand method of procedure was published in 1840, almost contemporarily by G. Bontemps and the younger Guinand. Very probably the information given by Ch. Fabre (1892), "Guinand had introduced boracic acid into the glass in 1842," refers to the latter. But the kind of glass thus obtained does not appear to have been durable.

Later on, in 1848, G. Bontemps, finding himself politically compromised, and being obliged to resign his position, accepted an invitation from the firm of Chance Brothers to go to Birmingham. His removal thence now carried the art of glass-making into England, and the firm acquired a great reputation for optical glass; as a matter of fact, the growth on foreign ground of the Guinand-Fraunhofer art was very favourable in respect to its technical excellence, and we may safely say that photographic objectives, up to the more modern times, were exclusively prepared from French or English material.

The great success which during the period mentioned had attended the technical manufacture of glass in Benediktbeuren and the brilliant achievements of J. Fraunhofer in telescopic optics, had become known to a very wide circle and excited general sensation. This was all the more natural, the production of flint glass having been looked upon as a trade secret. In 1824 the London Astronomical Society appointed a commission to conduct an inquiry into the manufacture of flint-glass. This commission, whose members included J. F. W. Herschel, M. Faraday, G. Dollond, and P. M. Roget, arrived at the conclusion that the improvements necessary were rather of a mechanical than chemical nature, and in particular that freedom from striae could only be brought about by constant agitation of the mixture.

The leading spirit of this commission, however, M. Faraday, did not confine himself to this simply theoretical discovery, but busied himself, both in his own laboratory and in the glass manufactory, with the practical solution of the question, and, by making some changes in the chemical composition, came upon glass easily fusible, which therefore offered greater facilities for the constant agitation operation. This substance, of remarkable limpidity, was known under the name of Faraday's heavy glass, and proved very important in experiments connected with the polarisation of light by magnetic action, and is composed, according to Muspratt, of the following ingredients:—

Protoxide of lead .....	104 parts.
Silicate of lead .....	24 "
Dry boracic acid .....	25 "

The next improvement, made independently of the Guinand-Fraunhofer school, took place in France by the manufacturer Maës in Clichy, and was the production of zinc crown. The exact date of the discovery

\* To readers desirous of further information, we beg to refer to Mr. T. B. Dallmeyer's able paper in THE BRITISH JOURNAL OF PHOTOGRAPHY, 1890, p. 293.



is unknown, its first appearance seems to have been at the London Exhibition in 1851, where it was distinguished by a Council medal. It contained oxide of zinc and a certain percentage of borax or boracic acid, being colourless and homogeneous in the mass. From Ch. Chevalier's communications, we learn that this material was used for his photographic objectives. At the Exhibition more weight had been laid on the applicability of the new materials to telescopic objectives, and two plates of 11.4 cm. ( $\frac{4}{5}$  in.) and 17.8 cm. (7 in.), colourless and free from striae, were exposed for show.

Very interesting is the abstract given by Sh. Maspratt from the report of the Council Jury on Optical Glasses. In this abstract great attention is drawn to the importance which the attempt of Maës for the removal of the secondary spectrum has when zinc crown is used in the place of flint-glass, whilst the place of the crown is taken by a hypothetical glass "in which fluorine enters as a distinguishing ingredient, in combination with silica, aluminium, or other materials." Such hypothetical glasses, colourless and homogeneous, had been made in small quantities. Since this report of the 1851 jury nothing further has been heard of the matter, and it does not appear that this initiative of trying to obtain objectives with diminished secondary spectrum has been followed up.

After the Maës procedure, which seems to have been carried out on a large scale, the regular production of this glass being mentioned even as recently as 1856, only one new kind of glass, of French origin, is known to me, and of which notice is made in the year 1867. This glass was melted by the Parisian glass manufacturer Lamy; it was a heavy thallium flint glass of specific gravity, 4.18, and a refractive index,  $n_D = 1.673$  ( $n_B = 1.661$ ;  $n_H = 1.710$ ), and was of a yellow colour. Whether the same was ever brought into use, I am not able to say.

Thus we see that at the time when the production of optical glasses was in a flourishing condition, both in France and in England, the consciousness of the importance of new glasses had not been lying dormant. In France some such did appear, but it does not seem that the attempts were carried on in any systematic manner.

Not long after the death of J. Fraunhofer, an English clergyman, William Venable Vernon Harcourt (b. June, 1789; d. April, 1871), began attempts in glass-making. At first he could make but few meltings, owing to the hindrances which always offer themselves to experimental laboratory meltings. A fresh impulse, however, was given to his efforts by G. G. Stokes, whose acquaintance he made on the occasion of the 1862 meeting of the British Association at Cambridge. This *savant* had busied himself with researches on fluorescence, and therefore evinced great interest in W. V. V. Harcourt's work. Inquiries on fluorescence, which appear to have been taken into consideration were, however, soon dismissed in consequence of the greater importance attached to the examination of the spectrum. From this time attempts were systematically carried on, and in 166 different meltings a series of very different components was put to the test, in order to ascertain their influence on the increase of the dispersion through the different regions of the spectrum. Doubtless, it was all the more difficult to determine this influence, as W. V. V. Harcourt had not been successful in producing the smaller samples homogeneous, and therefore the striae contained in the prisms ground from the samples made exact measurements impossible. Nevertheless, placing reliance on their measurements, W. V. V. Harcourt and G. G. Stokes were in a position to lay down certain rules, for instance, that titanio acid lengthens the blue, whereas boracic acid extends the red end of the spectrum. The principal aim of their researches was J. Fraunhofer's old object of melting glass suitable for removing the secondary spectrum; they considered they had nearly attained their aim and produced—according to A. Safarik—two discs of titanio glass and two of terborate of 7.6 cm. (3 in.) diameter which were destined for a telescopic objective free from secondary spectrum. In grinding the lenses it was found necessary to cast aside one of the titanio discs and to grind in its stead a lens of ordinary crown glass. The objective thus composed was not faultless, but proved that it was possible to get rid of the secondary spectrum.

W. V. Harcourt's death, in April 1871, appears to have put an end to these efforts for production of new glasses.

The results published by G. G. Stokes underwent a critique by S. Czapeki of which I take advantage in the following. The English *savants* had correctly recognised the specific influence of boracic acid, whereas they were in error respecting their statement concerning titanio acid. On account of the inconvenience of working with silicates, arising from the difficulty of fusion and the pasty character of the fused glasses, W. V. Harcourt's experiments were chiefly carried on with phosphates the influence of which were looked upon as that of titanio acid.

W. V. Harcourt's work was not taken up in England to any great

degree; one attempt of titanio glass made by J. Hopkinson in the glass works of Messrs. Chance Bros. was unsuccessful, because, as we have already remarked, the titanio acid does not possess the specific influence ascribed to it.

That similar experiments were not further carried on either by the English firm or the French Swiss manufacturers, notwithstanding the publications by G. G. Stokes lay—as E. Abbe has pointed out—apparently in the fact that on the one side the risk was very great, and, on the other hand, the production of optical glass had become, so to speak, almost a monopoly, and therefore no absolute necessity existed for these firms to put themselves to any extraordinary trouble.

The necessity of applying perfectly new glasses, of which the principal virtue was not the proportionate increase of dispersion in crown and flint glass, but a new relation between the medium refraction and the medium dispersion, was, as far as the photographic objective was concerned, pointed out by L. Seidel in 1856, and by J. Petzval in 1857, yet the remarks of these two men seem to have been passed over without attracting any attention. In 1878 E. Abbe laid great stress upon the importance of new glasses for microscopic objectives, further improvements with the old kinds having been found impossible. This necessity in microscopic, as well as the long-felt want in telescopic optics, became paramount, and turned the attention afresh of wider circles to this question. Later on, the attempts undertaken at a previous period by H. Schroeder and A. Safarik were also made public.

The first named had begun to melt magnesia crown glass in conjunction with Th. Daguet, of Solothurn, and, according to H. Schroeder, these attempts had taken place before the year 1870.

A. Safarik had worked with the aim of producing glasses with proportional increase of the dispersion, and especially after the method pointed out by the 1851 jury, in order to discover new glasses which could be used as crown glasses in combination with the old crowns, the latter to take the place of the flint components. But these attempts brought no results, owing to the insurmountable difficulties attached to the meltings of silicate in the laboratory.

An extensive change, however, took place when Otto Schott, a clever technical chemist, intimately acquainted, through serious study and family tradition, with the art of ordinary glass-making, and attracted by the report of E. Abbe on the necessity for new glasses, entered into connexion with the latter. The joint work of these two men began in 1881, in accordance with the plan agreed upon between them, to study minutely all the chemical elements which can be combined in any form as an amorphous flux, with regard to their influence, both on refractive index and dispersion. O. Schott undertook the experiments on a very small scale at Witten, in Westphalia, where he resided at the time, whilst the optical examination of the results by means of spectrometric measurements was made by E. Abbe, assisted by P. Riedel. In the course of the first year certain facts were elicited on the specific effect of different substances, and it was decided to continue the work on the chemico-optical principles already arrived at, and to systematically combine glass fluxes, the properties of which should satisfy the optical requirements as far as possible, and yet possess their usual physical characters, such as hardness, constancy of composition, and freedom from colour. To this intent O. Schott, in the spring of 1882, removed to Jena, where experimental meltings were made on the larger scale required in quantities of about 10 kilos (22½ pounds).

In these experiments two independent points were kept in view. The first concerned the problem prosecuted by J. Fraunhofer and his successors, of the proportional increase of the dispersion through all the regions of the spectrum, in order to gain a more perfect degree of achromatism, and thus lessen or destroy the secondary spectrum.

The second problem, of no less importance, was that of attaining greater variation in the two chief constants of optical glass, i.e., the refractive index and the medium dispersion.

The old silicate glasses could, in consequence of the uniformity of their chemical composition, as far as their optical qualities were concerned, all be represented by a single series. They exhibited, with some few and practically unimportant exceptions, a steady increase of the medium dispersion in the same proportion as the increase of the medium refractive index. The systematic use of a larger number of chemical elements made it possible to put at the optician's disposal glasses of the same refractive index but different in the value of the medium dispersion, or other glasses in which the medium dispersion was constant, whereas the refractive indices varied. The solution of this problem being successfully accomplished, the optician was in a position to satisfy L. Seidel's condition, and to use, for the purposes of photo-optics, crown glasses with a high refractive index.



The second stage of the work, which had begun in the spring of 1882, was the founding and setting up of a laboratory, in the year 1886, by O. Schott, E. Abbe, and C. and R. Zeiss, known as the Glass Manufactory for Optical Purposes of Schott & Gen., Jena, Germany. The building of these glass works was completed in 1884, and a liberal subvention on the part of the Prussian Government contributed in no small degree to the carrying out on a large scale of the first very expensive experiments for the fabrication of glass in large masses.

In quite recent times the example given in Jena has been effectively followed in Paris, where Ed. Mantois, the successor of Ed. Feil, apparently in the year 1893-4, took up the fabrication of the new glasses. Judging from reports by Ch. Fabre and E. Wallon, it appears as if attempts with new glasses had already been made towards the year 1880, but further particulars on the results obtained at that time have not been given in those references.

DR. M. VON ROHR.

### PHOTOGRAPHY AT THE PARIS EXPOSITION, 1900.

THE Secretary of the Department of Science and Art informs us that a representative collection of British photography is in process of organization for the Paris Exhibition in 1900.

The committee of the Royal British Commission who have this work in hand are being assisted in making a suitable selection by General Waterhouse in respect of Technical and Scientific Photography, and by Mr. R. Craigie in respect of Pictorial Photography.

### PHOTOGRAPHIC CANT.

(Paper read before the North Middlesex Photographic Society.)

I do not think I know any ordeal which would be more unnerving, more trying to a naturally modest man, than to appear before one's fellow-members and to attempt to address them upon some photographic subject. It is one thing to have ideas; it is quite another to be able to put them into words. Very often, indeed, the notion which appears quite cogent in its nebulous thought form ceases even to appeal forcefully when put to the test of more or less lucid exposition. I felt about this paper as many of us have felt when we have undertaken to exhibit at some important picture show. I had neither "a title" nor "a picture;" which to get first puzzled me. I saw this difference between a paper and a picture, viz., that in one case there necessarily was a connexion between the title and the thing. I could not talk about development and call it "A Chat on Mounting," as if, so to speak, it were a photograph of a "Path through the Wood" which had become "Sand dunes by Moonlight" owing to the accidental misuse of one's "Watkins." I could appreciate the probability of your seeing through so thin a disguise and criticising me adversely. I felt that even a limitation of this kind might adversely affect my efforts—that, indeed, I was between Scylla and Charybdis—for if I chose a title, a good title, I might not be able to write up to it; and, if I wrote a paper, I might find it difficult to find a suitable and descriptive title. I have little doubt but that I should have found it a severe stumbling-block if my difficulties had not been lightened for me by a lucky accident.

I saw in my programme that Mr. Mummery would read a paper here on "Doubtful Tendencies." I had never contemplated the possibility of there being two Mr. Mummerys, that he might be a kind of double star, nor could I think what trouble of mind or body he might have been passing through. I wondered whether he might have got religion, or disapproved the judging at Pall Mall, or whether he wanted to start a presidential crusade against the "adjourned meetings." Any way, I could see that he had got a good title for his paper, and in my then mood I wondered if he would write up to it. I could not, however, think about my paper that week. Poor fellow! I wondered what his tendencies had been, and how he had succeeded in overcoming them. I was sure he had "knocked" them, because, you know, a man never comes and tells us how to do a thing, or how not to do it, unless he has been through the mill himself and solved the point. Such a thing would be anomalous, and he would undoubtedly have to pay the penalty of never being permitted again to sacrifice the time and feelings of his fellow-members whilst he practised his oratory upon them. I had to get through that week as best I could, waiting to hear what those tendencies were; but I became convinced that a good title was a most desirable thing, and especially one which left one's audience in some doubt as to what you were intending to talk about. Seeing, then, the imperative importance of securing a good title, I decided to take one which left me with the freest hand to wander if necessary over the entire range of our art.

Such a title, I venture to hope, is that one which I have adopted for my paper to-night. But I have, indeed, been fortunate in being preceded by Mr. Mummery, because, not only has he convinced me of the importance of selecting a good title, but he has also taught me that it is easier to treat a subject from the ridiculous point of view (I mean from the standpoint of one casting ridicule, which is, of course, quite a different thing).

I feel that I might have talked to you to-night, and that I should have been properly within the scope of the title of my paper, and that is a complete justification of selecting a title which allows you the widest scope upon many technical subjects which might not have been interesting to you to listen to, but which would certainly have been interesting to me to discuss, because nothing helps one to clear one's ideas so much as the having to make them clear to other people. But I am obsessed with the desire to urge you to clear your minds of cant.

Now, of all cant, the cant of the artist is about the worst. It is the most arbitrary. An artist says that a work is not true, is unconvincing, is not sincere, or is not according to one of the cant phrases of his lingo. Gentlemen, I venture to suggest to you that the interference of the artist with photographic pictures and picture-makers is itself one of the most, if not the most, doubtful tendencies which we have to contend with.

The pseudo-artist has, indeed, taught one thing, namely, to flourish about with our thumb as if to indicate how easily we could demonstrate what we mean if we only had a brush or a palette knife at hand, an artistic trick, of course, of the second-rate order, and one for which, as photographers, we could more aptly substitute some imaginary putting of the head under a focussing cloth, or of making a view-meter of one's fingers. Gentlemen, the purpose of this paper will be fully accomplished if I can but start the idea that the intrusion of the cant of artist into photography is something which makes for the decadence of our method of appeal to the emotions.

I do not think it is an easy thing to decide whether photography is more injured by the cant of the exponents of the pictorial or artistic photography, or by the worse than execrable technique of some of our photographers; but it is tolerably certain that the former make it the more ridiculous. I cannot see any reason why photographers should not be free to produce their results without the trammels of a method which is not on all fours with ours, which has not the same limitations, nor has it the same excellencies and natural advantages.

For my part, I shall be content to see our method progress by the ordinary and natural means, viz., by the method of trial and error, by trying new modes of expression, by failure, and by the retention of the best. But I am bold enough to doubt whether the assistance of the artist (using this word in its accepted sense) conduces to the desired end. I do not think that it does assist, except by the painful process of teaching us what not to do a second time.

Again, let me digress a moment to refer to a useful function which the trained draughtsman may render the photographer. I refer to the criticisms upon exhibited works appearing in a periodical devoted to the pursuit of photography. I do not think that I know any more entertaining page than *Photography* "Criticism." They are delightful reading, lucidly composed, and tolerably free from the vague generalities which the average critic has taught us to expect. But I hardly remember an instance of usable constructive criticism. Defects are pointed out in inoffensive language, but the defects are the defects of our method of expression, of photography, in fact, and are inherent, and are impossible of alteration, or in most cases of improvement. They therefore serve no useful purpose, except that of providing readable and harmless "matter" for the edification of subscribers to the paper. If the critic (he has my whole-hearted admiration for the way in which he fills a page with simple observations more or less to the point) could give advice to the younger members of some society running a series of outings, he would undoubtedly raise the general standard of the average work of that society, but it would be by teaching the young ideas what not to shoot.

I venture to prophesy that so soon as he gave constructive advice it would be to produce a photographic impossibility. Gentlemen, not only do I boldly state my feeling of regret at the effects, the now apparent effects of the intrusion of the artistic cant into a hitherto guileless photographic method of expression of nature and beauty, but I notice in Mr. Mummery's paper a kind of "get-off-the-earth" feeling, which is disclosed in his complaint that photographers reproduce artists' effects without, as he says, "having found out what they mean by them." I confess that I have never troubled myself to find out what an artist, he of the brush or any other, means by his effect unless his picture told me the tale without the asking.

When I look at pictures, singly or at an exhibition, I look at the good ones—those that I think good, if you want the admission—and pass the bad and incomprehensible ones by, unless, indeed, a picture is ugly enough or incomprehensible enough to command a second look, just as one would look at a pig with five legs, or some other of Nature's slips. This cant phrase of "what the painter means" is only used as an excuse for some work which is asserted to be "tall" art. There may be art which wants explaining, but I don't think that photographers need worry about it. The art of the camera should always be clear, and on this point I seem to be in complete accord with Mr. Mummery, although, I fear, from a different view-point: mine because clearness is a characteristic photographic quality, Mr. Mummery's because painters' effects are the artist's frehold, off which the photographers must get.

It is very easy—at any rate, it is not difficult—to cast ridicule upon a young method of expression by appearing to disdain the materials used, and calling them "blacking" and sticky. Artists' slang, like the slang of the street, is but the use of meaningless catchy phrases, and it is all cant, the cant against which I am warning the members of this Society.



Photography is so essentially a method of appeal to the great mass of ordinary people—the large majority—that we shall do well to avoid anything and everything which appears to savour of the superior person, and a photographic cult is a thing to be most carefully, most assiduously avoided.

We have many media for the expression of our work. Let us use them all, without reference to the needs, or even the jealousies, of others, and certainly without any intention of being guided by the well-meant, but not well-informed, advice as to the direction in which photography should advance. It cannot be too clearly stated that there are essential limitations upon photography which render it almost impossible for artists to correctly gauge its value; indeed, it is to the fact that some of the defects of photography must nearly approximate to qualities which the artist sometimes sees as desirable that much of the worst photography may be attributed.

Then, gentlemen, I conclude with the admonition, Let us clear our minds of artistic cant. Let us keep clear of the tyranny of the idea that the experience of the artist in his world necessarily makes him an arbiter and judge of our work. Look at his erratic awards at Pall Mall; regard the essential differences in his method of treatment, his powers of modification of his subject and drawing, and his command of colour, and think whether the man who is so trained is necessarily a suitable mentor for the photographer. Study his works, listen to his words, but always with the reservation that its application to our method may be either impossible or unsuitable.

Look at the best works of the greatest artists and the finest photographers, and you will find them for the most part simple expositions of a great subject, treated with skill and technical accuracy, and free from incongruous defects. Our greatest art should be to know what can be done well, to do it as well as it can be done, and, above all, to do it simply. The artist of the brush will always be able to excel us in constructive skill, but the photographer should be able to run him closely in exactitude of drawing, in general technical accuracy, and in freedom from incongruous defects.

I believe that the advancement of photography is more likely to be attained by submitting our works to photographers of well-balanced and cultivated taste, and to the judgment of the general public (of the class interested in photography) on its own merits, than under the patronage of artists, however high their attainments or however well intentioned they may be towards photography itself.

S. HERBERT FRY.

### THE SCIENTIFIC (?) PHOTOGRAPHER.

PHOTOGRAPHY is, or rather should be, a scientific profession, but, judging from the photographic journals, its followers are far from being scientific. Undoubtedly the present-day system, whereby all the materials may be purchased ready for use, is largely responsible for this state of things, as, when photographers can buy plates, chemicals, printing-out, and enlarging papers ready-made, a large amount of chemical and scientific skill is not absolutely necessary, and, although it is undoubtedly a great advantage, and saves a good deal of wasted time and materials, when a fair knowledge of chemistry and the chemical reactions is combined with the technical skill necessary for the production of photographs, still it can be done without, and is by a large number of photographers, both amateur and professional, of the male persuasion; the lady devotees we do not expect to know much about the scientific side, but surely a man who takes up a scientific profession or recreation ought, at any rate, to have some elementary idea of what he is doing beyond merely taking the cap off the camera, and a professional who is constantly employing chemical reactions should have a slight idea of what those reactions are, or how is he to remedy the matter if anything goes wrong? He is simply working in the dark. The usual way with most of these photographers if anything goes wrong is to blame their materials and change to another make; if that does not work well with them, possibly they write to one of the photographic papers, very often to be told that it is their own fault; probably this disgusts them with this particular journal, and they discontinue patronising it, for the last thing the unscientific photographer likes to acknowledge or be told is that spoilt work is largely his own fault. These people are the bane of the manufacturers, who can only do business with them through a dealer, otherwise the manufacturers would be continually worried by constantly having stuff returned as bad, whereas the only bad part is the unskilful way in which it is handled, for the materials are thoroughly tested before leaving the manufacturer's works, and it is seldom that anything serious is the matter with them.

It is rather amusing when advising the average photographer to try a new brand of plates or papers; the reply very often is, "I get on very well with what I use, so why should I change?" or "I do not mind trying them if I can do it with the same developer or toning bath that I am using, but I shall not make up another." Although admitting that it is not a good or desirable thing for a photographer to be constantly changing his materials, surely any photographer who takes an interest in his profession should be willing and anxious to try innovations, and see how they compare with those already in use, or how can the trade progress? I dare say many of the old wet-plate photographers thought this way when the gelatine dry plate was first introduced; but, while we

must admit the excellence of the collodion method in some ways, more particularly in printing from a collodion negative, as those who have had experience with them must confess, what sort of profession would photography be now without the dry plate? How many could or would work the old process, and where would instantaneous photography be?

Many photographers seem to do little more than take the actual negative. I suppose they would not do that, only they cannot very well help it; possibly they may develop it, but the retouching of it, printing, toning, fixing, and mounting the positive is done by one of the firms who make a business of this sort of work. This kind of thing is bound to lower the standard of the profession, as so little skill is required that almost any one can become a photographer. Under these circumstances, all that is necessary, after getting the customer, is to take the negative; the rest is done outdoors, and the photographer whose name the finished portrait bears generally has not the slightest idea what quality of paper and mount is used, under what conditions the portrait is produced, or what chance it stands of permanency. If this class of photographer does his work himself, it is often done with dirty fingers, measures, and dishes, and it is really more by "good luck than management" that he is able to turn out work worth looking at.

Numbers of these photographers say they would like to use gelatino-chloride or collodio-chloride printing-out papers, but complain that they cannot get on with them, the reason being that they expect to work them under the same conditions as albumen, which cannot be done, and then they grumble because they cannot get the same results upon albumen as others do upon the emulsion papers. Apparently they are unable to understand that albumen is incapable of giving the fine results which the others give. Probably, when they work one of the emulsion, or, as they are pleased to call them, chloride papers, they ignore the makers' instructions; in fact, many do not trouble to read them at all; consequently their results are far from satisfactory. This they put down to the paper, which they say is no good, and really is no good to them, as they will not take the slightest extra trouble with it.

A glance through almost any of the photographic journals will convince any one how little many photographers know of their profession, or we should not read of professional, or would-be professional, photographers asking, "What toning bath should I use for a certain paper?" or "What developer shall I use for a certain plate or paper?" Novices we can understand asking such questions, but men whose living it is certainly ought to know something about the matter, for nearly all the plates and papers obtainable commercially give the necessary instructions for working them, and, if these scientific (?) gentlemen would only take the trouble to read those instructions, they would save themselves and the editors of the journals they patronise a large amount of trouble. But it is when one has personal business relations with this class of photographers that their ignorance of scientific matters comes out most forcibly, and the remarks of some photographers of several years' standing are very often surprising, and really make one wonder how they get on in business at all. Fortunately, this does not apply to the better-class photographers, many of whom are conscientious workers and thoroughly up in the details of their profession, men who know what to do and how to do it.

That photographers as a body are unscientific is proved by the fact that very few of the great improvements in photography have been introduced by professional photographers, a thing which can be said of few trades or professions; for, although it is not always the case, one naturally expects that a man who is constantly using an article will understand its defects, and where and how they might be improved.

C. T. SUTTON.

### LONG-FOCUS AND TELE-PHOTOGRAPHIC LENSES.

In looking through some negatives taken with a hand camera during recent years, and more particularly the earlier efforts, I could not help noticing the large percentage of views that would have been far better if taken with a long-focus lens. This more particularly applies to marine views, river scenery, and seaside work. On seeing a good picture, naturally one mentally expresses the opinion that such-and-such a part of it will make "a pretty bit;" and if the finder on the camera is not such as to give an exact counterpart of the image produced on the sensitive plate, as in ninety times out of one hundred is the case, the result will be disappointing. For instance, a pretty bay, with a harbour forming the mid-distance, and a large ship sailing majestically out to form a nice break to the amount of sea, bathing machines and people on the shore for a foreground. To the human vision nothing could well be more charming, but, when the photographic plate is exposed and developed, the result is disappointing to a degree—everything except what is quite close is liliputian, the ship that was such a prominent object is a mere toy boat, and the harbour projection is insignificant.

One remembers taking a trip down the river, and nearing Southend a large liner is aground, with several steam tugs making an effort to get the huge ship off. The eye sees it all thoroughly well, and the picture



is bold, but a snap-shot in passing gives a result such that even with a powerful magnifier the ship and tugs can only just be made out.

Again, going down the River Rance, in Brittany, from St. Malo to Dinan, the pretty scenes on either bank are most fascinating, and, notwithstanding the river is not by any means such as would be considered broad, yet the houses, special landmarks, and interesting spots on the banks or border of the river are shown in the photographs of a size that most people would consider unimportant.

In river work, at rowing or sailing matches, &c., unless one is like the venturesome Mr. West, and had a little boat of his own to "run up" so close that they take serious risks of being "run down," the results will fall short, by a large amount, of what was desired. Instances, in fact, can be multiplied to any extent, but the above will suffice to show what cannot be done with hand cameras with lenses as usually fitted.

Before me, as I write, are four examples taken with lenses of different foci from the same spot with a rapid rectilinear and tele-photo lens. The view comprises a church on one side of a street, with a chapel connected with some almshouses in the distance, which lies back from the main road running at right angles to the street. The distance of the chapel from the camera is about 100 yards. The first picture is that mentioned above, giving the chapel 12 mm. wide on the plate, and is taken by the rapid rectilinear lens of 5 inches equivalent focus; the second taken by one half of the combination and about double the focus of the whole lens produces an image on the plate of the chapel 20 mm. broad. With the tele-photo lens, with partial extension and moderate power, the chapel appears on the plate 48 mm. broad, and, with nearly full extension or greatest power, 78 millimetres broad.

These photographs, taken to test an apparatus designed for long-distance photography, such as a war correspondent may be called upon to use if he wishes to record battle scenes, or obtain mountainous or other views, show that, even in the month of October and within four miles of Charing Cross, a passable print can be obtained from a negative having an exposure of one second with the tele-photo lens, notwithstanding the day was hazy but sunshiny, while with the 5 and 10-inch focus lenses the exposure was half a second. The stops used for the 5-inch lens were  $f/8$ ; for the 10 inch,  $f/64$ ; and the equivalent of the tele-photo would be  $f/32$  and  $f/52$  (about) respectively.

Cameras with single lenses, having a focus of 20 inches and 32 inches, are very unwieldy; but, given suitable stands so that the camera will not vibrate, some excellent results can be obtained with uncorrected single lenses, such as meniscus spectacle lenses. Two examples of hilly scenery I have that were taken by a friend of mine, Mr. Fluske, at a place in Kent, and show the objects on the distant hills, over a mile away, most clearly, while the letters on the sign-post in the foreground can be distinctly read, notwithstanding they were at a position far enough off for a man to be almost out of shouting distance. The tele-photo lens gives the same valuable result with a moderate size apparatus and with very little extra extension of the camera—for instance, with the highest magnification, only three times the normal extension.

The American makers of cameras are paying special attention to long-focus combined hand and stand cameras, and one or two of our English makers are also making distinctive patterns of this order. With careful attention to detail and convenient stays to secure rigidity, it is quite possible to have a light and efficient camera for all-round instantaneous and time exposures.

G. R. BAKER.

#### THE PHOTOGRAPHIC CONVENTION—PRESENTATION TO THE MAYOR OF GLOUCESTER.

On Wednesday, Oct. 25, at the Guildhall, his Worship the Mayor of Gloucester (Alderman Braine) was the recipient of an interesting presentation as the memento of the National Photographic Convention which was recently held in Gloucester. The presentation took the form of a framed group of the members of the Convention, which was taken by Mr. Pitcher at the Spa.

Mr. H. Medland (President of the Gloucestershire Photographic Society), who was accompanied by Messrs. H. S. Crump, W. Hodges, and B. W. Dugdale (Hon. Secretary), made the presentation and read the following letter received from Mr. F. A. Bridge, Hon. Treasurer of the Photographic Convention of the United Kingdom: "My dear Mr. Mayor,—I am requested by the Council of the Photographic Convention of the United Kingdom to ask your kind acceptance of the accompanying memento of our Gloucester Meeting, a Convention which may justly be regarded as one of the most successful ever held—a result due, not only to the efforts and assistance rendered by the Gloucester citizens generally, but the great amount of personal interest evinced in it by yourself."

In acknowledging the present, the Mayor said the photograph would remind him of one of the very pleasantest functions which took place during his year of office. He thanked them exceedingly for the present, and expressed the opinion that, if ever the Convention decided to visit Gloucester again, they would be accorded a welcome quite equal to that received last summer.

Mr. R. W. Dugdale said that, as that would probably be the last occasion they would be able to do anything in connexion with the Gloucester Convention, no doubt the Mayor would be pleased to hear that the Council had expressed the greatest satisfaction with the manner in which the affair, socially and financially, had been managed. Mr. Bridge, in a letter to him, stated, with regard to his balance-sheet, he began the year with 1*l.* 8*s.* 4*d.*, and his balance in hand now was 63*l.* 6*s.* 8*d.*, so that was all right. Locally, Mr. Dugdale remarked 37*l.* was received in subscriptions, and, after paying all attendant expenses, they were enabled to hand over the sum of 17*l.* odd to the funds of the Gloucester Photographic Society.

Mr. Medland stated that it had been arranged by the local Photographic Society to give an exhibition of slides from photographs taken by the visiting members of the Convention, on Monday, November 6.—*Gloucester Journal*, October 28, 1899.

## Our Editorial Table.

### MOUNTS FOR CHRISTMAS CARDS.

George Houghton & Son, 89, High Holborn, W.C.

ONCE again Messrs. Houghton send us samples of the mounts for Christmas photographs, the supply of which they make a speciality. It would seem that, in delicacy and tastefulness of design and effect, some-



thing approaching to perfection had been reached, for we can hardly imagine card mounts of greater refinement than those before us. The blocks illustrate two of the designs. We can cordially recommend Houghton's Christmas mounts to the attention of photographers.

## News and Notes.

WE are glad to learn that Mr. F. O. Bynoe, of Messrs. R. & J. Beck, Limited, 68, Cornhill, E.C., has recovered from the seven weeks' illness from which he has recently suffered, and has returned to business.

AMONG those who left England recently for the front was Major W. C. Beavor, Royal Army Medical Corps, who took with him a Röntgen-ray outfit for the purpose of localising the bullets. He used the Röntgen rays with great success in the Tihrah campaign.

THE LONGTON EXHIBITION.—Entries for the forthcoming Exhibition of the Longton and District Photographic Society close on Monday, November 6. Communications to be addressed to the Hon. Secretary, Mr. Thomas Mottershead, 43, Stafford-street, Longton, Staff.

MR. WILLIAM HENRY BAILEY, clerk in charge of the bookstall on the Low Level Station at the Crystal Palace, died in the Norwood Cottage Hospital a fortnight ago. The deceased, an amateur photographer, mounted the roof of the station in order to take some snap-shots of the Palace. Missing his footing, he fell and broke his leg.

ENLARGEMENT COMPETITION ORGANIZED BY THE "REVUE SUISSE DE PHOTOGRAPHIE," GENEVA.—The *Revue suisse de Photographie* is organizing, for February 1900, an international competition of enlarged prints on paper, which will be open to amateurs and professionals. Further information may be obtained from the Secretary, 40, Rue du Marché, Genève.



On November 8, Mr. C. F. Townsend, F.R.P.S., will deliver a lecture before the Borough Polytechnic Photographic Society on "Elementary Chemistry for Photographers," illustrated by practical experiments and lantern slides. An open invitation is extended to all who are interested, and tickets of admission will be sent on application to the Hon. Secretary, Mr. P. C. Cornford, 103, Borough-road, S.E.

**A LONG PHOTOGRAPHIC TELESCOPE.**—Last spring a plan was proposed at the Harvard College Observatory for the construction of a telescope of unusual length for photographing the stars and planets. Anonymous donors have now furnished the means by which this experiment may be tried. The plan will therefore take definite shape, and it is expected that a telescope, having an aperture of twelve inches and a length of 100 feet or more, will be ready for trial at Cambridge in a few weeks.

**BELGIUM.**—The Lantern Night at the Royal Photographic Society at Pall Mall, on Saturday next, is to be devoted to Belgium, when some 200 slides from negatives taken during the Belgium Photographic Excursion, organized by Messrs. William F. Slater and Walter D. Welford, will be shown and described by the latter gentleman. Some twenty members of the party have contributed, and, as some good workers went the trip, the slides should be of excellent quality. The evening will also form a reunion, as several of the Provincial members of the excursion have signified their intention of being present to see the display and the Exhibition generally, and to meet again together.

**THE BOOTLE EXHIBITION.**—The following are the Judges' awards in the Open Classes.—Class VII.: Silver medal (No. 180), Mr. C. Court Cole, F.R.P.S., Oxford; bronze (No. 218), Mr. R. Eickemeyer, jun., New York. Class VIII.: Silver medal (No. 222), Mr. C. Court Cole, F.R.P.S., Oxford; bronze (No. 232), Mr. H. C. Leat, Bristol. Class IX.: Silver medal (Nos. 258-263), Mr. W. E. Inston, Liverpool; bronze (Nos. 252-257), Mr. W. Fisher Ward, Bantry. Class X.: Silver medal (No. 307), Dr. Saunders, Bootle; bronze (No. 295), Mr. W. F. Slater, London. Class XI.: Silver medal (Nos. 446-449), Mr. John Beeby, New York; bronze (Nos. 401-404), Mr. E. R. Bull, London. Class XII.: Silver medal (No. 471), Mr. R. Eickemeyer, jun., New York; bronze (No. 461), Mr. C. Skelton Tyrer, Earl's Caine. Class XIII.: Silver medal (No. 477), Mr. W. J. Brooke, Doncaster; bronze (No. 482), Mr. H. C. Leat, Bristol. Gold medal for best picture in above classes (No. 471), Mr. R. Eickemeyer, New York.

We regret to record the death, which occurred on Thursday last, of Mr. William Wiggins, of Ferndene, South Shore, Blackpool, at the age of sixty-four. Up to a few weeks ago Mr. Wiggins carried on the business of a photographer in Talbot-road, Blackpool, building premises for the purpose at the corner of Abingdon-street and Talbot-road. He went from Bolton (his native town) to Blackpool about thirty-seven years ago, and commenced as a photographer and drawing-master in Adelaide-place. He attended most of the schools in the Fylde District in the latter capacity, and also taught at Rossall College. When the premises he tenanted were taken over by the Palatine Company, Mr. Wiggins removed to Talbot-road, where his business is now carried on by his eldest son, Mr. C. Wiggins. Mr. Wiggins did not take any public part in the affairs of the town, but he occupied a position in connexion with St. John's Church, which he attended. For about two years the deceased gentleman had been suffering from a very painful internal ailment, and this was the cause of his death. He leaves a family of three sons and three daughters.

It is with the greatest regret that we record the death, which occurred on Friday morning last, of Mr. Samuel Wolstenholme, photographer, Wellington Studio, South Beach, Blackpool, at the age of sixty-one years. Mr. Wolstenholme was a very prominent figure in Blackpool, having resided there for the past thirty-two years. Born at Rhodes, near Manchester, for some years he carried on the business of a photographer, and went to Blackpool in 1867. After being in Church-street, Blackpool, for some time, he took a studio at North Shore, and occupied land on the cliffs, now occupied by the Lower Walk. As his business extended, Mr. Wolstenholme took a wooden shop on South Beach, and finally became the owner of the present establishments at Talbot-chambers (opposite the North Pier), and the Wellington Studio, where he resided with his family. The deceased gentleman at one time had photographic studios in Middleton and Morecambe. In connexion with photography it is interesting to note that Mr. Wolstenholme was the first to introduce the popular stamp photographs into Blackpool. In politics he was a Liberal, but, for some years past had taken no active part in local political affairs, and last year he refused to stand for Brunswick Ward on account of ill health. He was a prominent member of the Clifton Masonic Lodge, having been connected with the Lodge for the past twenty years.

## Patent News.

The following applications for Patents were made between October 16 and October 21, 1899:—

**COLOUR PHOTOGRAPHY.**—No. 20,813. "Improvements in Apparatus for Exhibiting Photographs in Natural Colours." Complete specification. R. KRAYN.

**SYPHON WASTE.** No. 20,977. "Syphon Waste for Photographic Dark-room Sinks." J. WILLIAMSON.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
4.....	Oroydon Camera Club .....	Forty-eighth Public Lantern Show.
6.....	Bradford Photo. Society .....	The Woodlands. Percy Lund.
6.....	Camera Club .....	Concert.
6.....	Cripplegate Photo. Society .....	Photographic Cant. S. H. Fry.
6.....	Kingston-on-Thames .....	Annual General Meeting.
6.....	Royal Photographic Society ..	Some Beauty Spots of English Scenery. J. A. Hodges.
6.....	South London .....	Photographic Chemistry. J. Arthur Formoy, F.R.A.S.
7.....	Birmingham Photo. Society ..	Demonstration with the "Dusting on" Process. Walter Griffiths.
7.....	Bristol and West of England ..	Elementary Technical Instruction Meeting: The Camera.
7.....	Gospel Oak .....	Negative-making. Rev. F. C. Lambert.
7.....	Hackney .....	Portraiture. Harold Baker.
8.....	Borough Polytechnic .....	Elementary Chemistry for Photographers. C. F. Townsend, F.R.P.S.
8.....	Camera Club .....	Lantern Night.
8.....	G.E.R. Mechanics Institution...	Lenses and Photo Optics. H. W. Bennett, F.R.P.S.
8.....	Photographic Club .....	Members' Open Night.
8.....	Royal Photographic Society ..	Palestine. P. B. Salmon.
8.....	West Surrey .....	Jumble Sale.
9.....	Camera Club .....	Liquid Air. Dr. W. Thompson, M.A., assisted by T. C. Hepworth, F.O.S.
9.....	Liverpool Amateur .....	Lantern in Use.
9.....	London and Provincial .....	Lantern Night.
10.....	Bristol and West of England ..	Demonstration: Sandell Multiple Plate and Film. Sandell Plate and Film Company.
10.....	West London .....	Demonstration: Gravura Paper. A. C. Baldwin.
11.....	Royal Photographic Society ..	Lucerne and its Environs. John H. Gear.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 26,—Mr. T. E. Freshwater in the chair.

Mr. J. E. HODD sought an explanation of some strange appearances on a celluloid half-plate film. What looked like a partially sensitive spot, the size of half-a-crown, appeared in the centre, but Mr. Hodd was assured that no opaque body had been placed over this spot, and the rest allowed to fog. Other spots of a like character were visible. Nor was it like uneven development. The other films of the same batch behaved satisfactorily in every respect. Whatever the cause, a remark that the affected portions showed the negative at its best must certainly be upheld. It was also thought to be not unlike some failures shown some time ago, in which it was pretty certain that the defect was the result of emanation from the camera, as, where a brass plate appeared at the bottom of the camera, in the corresponding portion of the plate was its outline, the brass preventing the fumes given off from reaching the film. Another suggestion was that water, or some fluid, had reached the film before development.

### TRAILL TAYLOR MEMORIAL.

Mr. PHILIP EVERITT (Hon. Secretary of the Traill Taylor Memorial Committee) announced that the second lecture would be delivered on Tuesday, November 14, at 66, Russell-square, by permission of the Royal Photographic Society. Mr. A. Haddon will occupy the chair, and Major-General J. Waterhouse, I.S.C., will read a paper entitled "Teachings of the Daguerreotype." Mr. Everitt wished it to be known that no tickets will be issued, and that all are invited to attend.

### COLOUR PHOTOGRAPHY.

Mr. GOWENLOCK was present to describe the new "Kromaz" system of colour photography. This system is based upon the fact that all colours are equivalent to, or can be matched by mixtures of, the three primary colours—red, blue-violet, and green. In other words, it is based upon what is known as the trichromatic theory of colour vision, and involves Clerk-Maxwell's colour sensation curves. What is new in this system is that there are two pairs of stereoscopic images, instead of three, an end arrived at in this way: The right eye is made to see one colour, the left the second colour, and both eyes the third colour. There are thus four colour records. Two are due to the green, and form a stereoscopic pair, and two are due respectively to red and blue-violet, forming in themselves a second stereoscopic pair. The four records are secured upon one half-plate by two successive exposures. A Cadett Spectrum plate is used. The red and blue records are taken together simultaneously by the first exposure. The two green records are secured by the second exposure. In the first exposure it is necessary to equalise the exposures for the red and blue by slowing the action of the latter to the time required by the red. This is done by the insertion of an orthochromatic screen in front of the blue-recording portion of the plate, thus following Dr. Joly's process. The ratio of exposure with the Spectrum plate was given as—

Without any screen .....	1.
Green images .....	10.
Red image .....	30.

The blue image, as previously pointed out, is adjusted for the same exposure as the red in this system. A single-lens camera is used. The stereoscopic effect is secured by the use of Brown's stereoscopic mirrors, which are supported immediately in front of the lens and transmit two images to the plate. To the back of the camera is attached a repeating back, taking a half-plate slide in which are placed the red, blue, and green screens. Any ordinary front focussing camera may be used, and the adaptation required is by no means extensive. A plate sensitive to all the colours of the spectrum is



necessary. Such a plate is found in the Lumière Panchromatic and in Calett's Lightning Spectrum plate. The colour screens sent out with the apparatus are adjusted to these plates. Care, of course, is required in handling such plates. They should be put in the back in darkness, or in a "safe light"—Calett's to wit. A safe light may be obtained by facing the ordinary ruby lamp with red and green tissue paper. After exposure, the plate is developed as usual. Metol is specially recommended, but ortol, pyro soda, &c., may do as well. A positive, by contact, on a transparency or photo-mechanical plate, is then taken. There was no strict necessity for black tones in the transparency, but the density should be looked to. Mr. Gowenlock passed round a plate containing the four negatives, and a positive plate therefrom. The exposure for the negative was twenty seconds; stop,  $f/8.5$ , the speed of the plate being 256 H. & D. The Lightning Spectrum plate was used, the place being a well-lighted studio. Long exposures were found to result in flatter pictures than short exposures, by which brightness was best secured. For viewing the positives in the chromo-stereoscope, daylight is to be preferred. Failing this, the electric arc is the best artificial illuminant. Incandescent gaslight was the best that could be arranged for at the meeting. This is somewhat deficient in blue rays, consequently the whites are not purely shown. In conclusion, Mr. Gowenlock explained the apparatus, the operations, &c., and passed round negatives and positives for examination.

A number of questions were put to the speaker. The spectroscope, it was found, revealed certain discrepancies between the screens and the statement that they complied with Clerk-Maxwell's colour curves. They did not appear to cut off strictly according to the theory named.

Mr. GOWENLOCK replied that practically the screens did all that was required. It was their wish to place the process before photographers cheaply. Therefore to make every set of screens theoretically perfect (practically they were) was impossible. It would mean that one in ten alone would be passed. He wished to state that the screens brought up were chosen at random. Of course, it must also be remembered that the screens were adjusted to the Spectrum plate. The peculiarities of this might alone account for the screens in themselves appearing to diverge from Clerk-Maxwell's actual curves. There was a little, but not much, variation of colour sensitiveness between different batches of emulsion. With regard to the fact that two images of the green sensation were taken, the excess of that colour was reduced or subdued in the viewing instrument. The process could be worked with a quarter-plate camera, but stereoscopic effects would have to be abandoned. Four exposures would in this case be necessary, on two plates.

#### PHOTOGRAPHIC CLUB.

OCTOBER 25.—Mr. L. Medland in the chair.

The CHAIRMAN showed a negative and a print of a group in which the hat of one of the figures in front, was transparent to such an extent that a figure standing behind could be plainly seen through it. The perpetrator of the photo had assured him that this was no practical joke, and that during the exposure nothing had happened which would account for the phenomenon.

Mr. F. A. BRIDGE said that, although he did not doubt the *bona fides* of this statement, he was perfectly satisfied that it was substantially incorrect. The hat was evidently only on during part of the exposure, and—barring ghosts—this was the only explanation of the incident.

Mr. A. MACKIE was of the same opinion, and he pointed out that this was corroborated by the negative, which on closer examination revealed the fact that the hat in question had received a shorter exposure than the rest of the picture.

Mr. J. NESBIT after having examined the negative, finally disposed of the question by stating that the transparent hat was the only ghostly thing about the whole business.

The CHAIRMAN then introduced Mr. C. Dalgarno, who after having tramped through Europe during the last twenty years, lately took to cycling, and, having completed his outfit by buying a camera, rode to Trieste and back, taking snap-shots on the way. The tour as described by Mr. Dalgarno by the help of a number of slides proved an exceedingly interesting one. Through sleepy Moselle valleys he took his audience up to the more stately Rhine, and thence to Nuremberg, that Bavarian town so brimful of reminiscences of a glorious past. From here *via* Regensburg to Passau, where the Danube is first capable of carrying freight steamers and then over the Alps, past many a snow-clad mountain, down to where the blue waters of the Adriatic reflect an Italian scenery. Then back through Switzerland and over the Black Mountains, through Alsace Lorraine and the Ardennes to England, Home and Beauty.

A hearty vote of thanks was passed to Mr. Dalgarno for his very interesting and instructive lecture.

**Liverpool Amateur Photographic Association.**—A very good audience assembled on Tuesday night, October 19, at the rooms of the above Association, to hear Mr. G. E. THOMPSON lecture on

#### SOME DODGES OF LANTERN-SLIDE FINISHING.

Mr. Thompson, who is an expert in the art of slide-finishing, showed his audience the method of putting in clouds in lantern slides by means of stump and pencil, the drawing of diagrammatic slides, and the colouring of photographic slides. A large number of slides, made and finished by Mr. Thompson, were passed through the lantern, and were much admired by the audience. At the close of the lecture Mr. Thompson gave a practical demonstration of the dodges he had advocated in the lecture, the audience taking a great deal of interest in the various operations.

OCTOBER 28.—The attraction of the evening was a lecture given by the eminent local artist, Mr. R. TALBOT KELLY, R.B.A., whose beautiful portrayals of Eastern life and scenery are familiar to all visitors to the local galleries. A crowded audience had assembled to welcome Mr. Kelly, who had selected as his subject

#### SARACENIC ARCHITECTURE AND DECORATION.

The lecturer, by means of a number of lantern slides of his own manufacture,

pointed out the salient features of Saracenic art as seen in the mosques of Egypt, laying special stress on the beauty of the domes, the inlaid work of the interior, and the pointed arches. In dealing with the beautiful inlaid work of the interior Mr. Kelly had taken infinite pains in order to find the fundamental principle underlying the complex geometrical design, and by the aid of a series of slides made of sketches showed that a simple cross was the foundation. Mr. Kelly also showed a number of slides illustrating beautiful metal work, both ancient and modern, and Saracenic art in its relation to domestic architecture, as shown by the overhanging balconies so prominent a feature in Egyptian street scenes. In conclusion the lecturer drew a striking comparison between the Saracenic art and the Moorish as seen at the Alhambra.

#### FORTHCOMING EXHIBITIONS.

1899.  
November 3, 4 ..... Photographic Salon. Hon. Secretary, R. W. Craigie, The Camera Club, Charing Cross-road, W.C.  
" 3-11 ..... Royal Photographic Society. Hon. Secretary, Major-General Waterhouse, 66, Russell-square, W.C.  
" 3-19 ..... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.  
" 15-17 ..... Hackney Photographic Society. W. Selfe, 70, Paragon-road, Hackney, N.E.  
" 20-25 ..... Longton and District Photographic Society. Thomas Mottershead, 43, Stafford-street, Longton, Staffordshire.  
" 27-Dec. 18. American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.  
December 7-9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.  
" 11-Jan. 1900 Huddersfield (Invitation). W. A. Beevers, Cloth Hall-street, Huddersfield.  
" 27-30 ..... Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.  
1900.  
January 29-31 ..... Southsea Amateur Photographic Society. F. J. Mortimer, 10, Ordnance-row, Portsea.  
April 3-7 ..... Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### THE ECLIPSE PHOTOGRAPH AT THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

To the EDITORS.

GENTLEMEN,—Lieut.-General Tennant's two letters *re* the eclipse photograph at the Royal Photographic Society's Exhibition have just come under my notice, and I hope you will allow me to say a few words to save the photographic reputation of the exposé of photograph No. 357.

General Tennant's explanation in his second letter by "partial reversion" is the true one, and many of us are familiar with this phenomenon, which is by no means uncommon.

Fortunately, or unfortunately as it really was, a similar photograph of the (partially) eclipsed sun was obtained at our camp at Viziadrug, on the West Coast of India, during the last eclipse. It was intended to make, with a 5×4 folding Kodak, four exposures during totality of fifteen seconds each, and the instrument was put in charge of a blue-jacket, who received the necessary instructions. While the last exposure was in progress the sun appeared from behind the dark moon, and a positive from this negative appears as follows: The portion of the sun that is appearing is black; the moon, which in all the other three photographs secured is black, is in this one nearly white, but of sufficient density to



allow one to differentiate between the limb and the white (bright) corona. The photograph gives one the impression that a white disc is passing in front of a dark one.

Although I have not seen No. 357, I think there must be a considerable resemblance between these two photographs, but the cause of their peculiarity is undoubtedly a case of "reversal," due to the extreme brilliancy of the exposed portion of the sun.—I am, yours, &c.,

WILLIAM J. S. LOCKYER.

*Solar Physics Observatory, South Kensington, October 27, 1899.*

## THE COMBINED BATH AND GELATINO-CHLORIDE PAPER.

To the Editors.

GENTLEMEN,—For a long time past I have used a certain P.O.P., and found it to give me more uniform results in tone than most other papers I have tried. The tone I like is a warm purple-brown with pure whites, and these I have invariably succeeded in getting until recently with the combined bath, made according to the formula. I never could get uniform and satisfactory results with the separate toning bath of sulpho-cyanide the makers recommend, though they say that, if their formula is followed, a range of tone from sepia to purple-brown and black can always be secured by using a proportionate quantity of gold and sulpho-cyanide to a certain number of prints, the quantity of water being immaterial. Whatever the cause, I have not succeeded in getting anything like satisfaction or uniform tone by this method, and have therefore stuck to the combined bath; but the last packets of paper I have received from them have not given me the usual results with the combined bath, so that I begin to suspect there is something wrong with the paper, that it is falling off in quantity, or else they have sent me a very old or defective sample. I have always been satisfied with both their bromide and P.O.P. paper, which has invariably given me good results. But I wish to try other makers, and I shall feel greatly obliged if any reader will inform me the maker or makers whose paper he considers capable, with careful and proper manipulation, of producing the best and most reliable work.

As regards the question of permanency, I am aware that your views are in favour of separate toning, but the method I have adopted for some years in using the combined bath has given me prints which certainly keep as well, if not better, than those I have toned and fixed in separate baths. The size of the plates I work is 10×8, and in toning with the combined bath I simply float the prints on the solution just in the same way as you sensitise albumenised paper. The action of the bath is thus confined to the sensitive surface of the paper, and the solution does not penetrate the pores of the paper at the back, so that the amount of washing to get rid of the hypo is considerably reduced, the purity of the whites, I believe, is improved, and a greater chance of permanency assured. I generally float the prints from fifteen to twenty minutes, and if the desired tone is acquired in less time, I remove the print and float it on a plain solution of hypo for the remainder of the time, so as to ensure perfect fixation. I do not for a moment suppose that professionals, who tone and fix their prints in large batches, would take up this plan, but for amateurs, who work from 10×8 to 12×10 and larger plates, and desire the best results, I think it worth consideration.—I am, yours, &c.,

THOS. MITCHELL.

## CHEAP ENLARGEMENTS.

To the Editors.

GENTLEMEN,—I am sending you herewith a cutting from the *Sun* of to-day's date, and a copy of a letter I have addressed to the proprietors of that journal. May I ask you to give them both further publicity in your columns, in order that the profession generally may know of their latest competition and do what they can to meet it. I might suggest that each photographer should display the *Sun's* offer together with a specimen of what he himself can supply at the same price, when I venture to predict that the general average of the quality of the photographer's work would be found to be better than that supplied by the paper.—I am, yours, &c.,

DRINKWATER BUTT, F.R.P.S.

35 Keppel-street, Russell-square, W.C., October 26, 1899.

[COPY.]

To the Proprietor of the "*Sun*," Temple Avenue, E.C.

DEAR SIR,—I note that in your issue of to-day's date you are offering crayon portraits at 6s. 6d. each. You are, of course, quite within your rights in adding photographic work to your business of newspaper publishing (though photographers will not thank you for introducing further competition in an already overcrowded business), but you might at least refrain from adding the following, as you do in your statement that "these portraits would cost four or five times the amount if ordered through artists in the ordinary way," which is nothing more or less than an insinuation that such things are ordinarily much over-charged for. As a matter of fact (and as you will very quickly find out if you have courage enough to publish this letter), almost any photographer can supply work of the same size and quality as you are doing at the same price. Where a higher amount is charged, there will be found a corresponding increase in the quality of the work.

I am calling the attention of photographers to your offer in order that they may have an opportunity of expressing upon it the same kind of opinion that you would probably arrive at if you found a syndicate of photographic artists offering for a farthing an evening paper of a quality that would cost a half-penny if ordered of the *Sun* office in the ordinary way.—I am, yours faithfully,

DRINKWATER BUTT, F.R.P.S.

[The offer of the *Sun* is the not unfamiliar one of a bromide enlargement for 6s. 6d.—EDS.]

## ORTOL.

To the Editors.

GENTLEMEN,—In the *JOURNAL* for the week is a request from a correspondent ("Mew") for a formula for using ortol. Professor Bothamley wrote an excellent article upon it, which appeared in *Scraps* (November, 1898). It stands thus:

### ORTOL SOLUTION.

Ortol .....	140 grains.
Potassium metabisulphite .....	60 "
Water up to .....	20 ounces.

### SODA SOLUTION.

Soda crystals .....	2 ounces.
Sodium sulphite .....	2 "
Potassium bromide .....	20 grains.
Water up to .....	20 ounces.

For general purposes take ortol solution, 1 part; soda solution, 1 part; water, 2 parts. In cold weather use water, 1 part. I have used this with success.—I am, yours, &c.,

Stradbroke, Eye, October 28, 1899.

WM. GIRLING.

## THE TRAILL TAYLOR MEMORIAL LECTURE.

To the Editors.

GENTLEMEN,—I shall be much obliged if you will permit me to inform your readers that the Second Traill Taylor Memorial Lecture will be delivered by Major-General Waterhouse on November 14, at eight o'clock p.m., at 66, Russell-square, by kind permission of the Royal Photographic Society. The subject of the lecture is "Teachings of Daguerreotype," and Mr. A. Haddon has kindly consented to take the chair. Admission will be free, without ticket.—I am, yours, &c.,

P. EVERITT.

88, Evering-road, London, N., October 30, 1899.

## Answers to Correspondents.

- \* All matters intended for the text portion of this *JOURNAL*, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.
- \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.
- \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & CO., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

J. Landon, 134, Queen's-road, Watford.—Photograph of Alfred Augustus Cooke.

W. Harvey, 132, Townhead, Kirkintilloch, Scotland.—Photograph of Free St. Andrew's Church, Kirkintilloch.

RECEIVED.—ANXIOUS; COPYRIGHT; PRINTER; DE LAWIS; PHOTOFAD; O. CLARK; AGREEMENT; VERAX; M. G. A.; and others. In our next.

VALUE OF NEGATIVES.—INQUIRER says: "Enclosed please find three prints for your inspection. I have had an offer to sell the negatives from which these prints were taken, and would like to know what, in your estimation, they are worth to sell outright."—In reply: The negatives are worth from 5s. to 10s. each, not more.

BUILDING ACT.—C. R. W. If the District Surveyor tells you the plans for the studio are not in conformity with the Building Act, you had better alter them. If you contest the matter, it will cause you a deal of trouble and delay, and, what is more, you will probably have to give in in the end. We may tell you that we do not think your reading of the Act is the correct one.

WHITE SPOTS ON PRINTS.—W. CARTWRIGHT says: "The white spots on this print are caused by the paper sticking to the plate through dampness. The deposit remains on the plate. Will you kindly tell me what would dissolve it from the plate?"—Possibly the deposit may be removed by soaking the negative in water and then carefully rubbing it off. If this fails, try King's solution, sold by Marion & Co. It is possible, however, that the negative is irretrievably ruined.



**PLASTER OF PARIS.**—B. WARNER says: "I have been attempting to make some plaster casts from gelatine reliefs. I can get the reliefs all right, but my trouble is that the plaster takes a long time to dry, and, when dry, crumbles all to pieces. It is not hard like the plaster casts one buys. Can you give me any enlightenment on the subject?"—If the plaster behaves in the way stated, it is bad. Get some freshly made from some of the plaster-image-makers in the neighbourhood of Leather-lane, Holborn. They have it specially for their purposes, and that will answer yours.

**CONTINUOUS PRINTING.**—H. MOREL says:—Can you inform me where to obtain a quarter, half, or whole-plate printing machine to make continuous exposures on any length strip of paper, or a machine for all sized negatives to do same work? If not now in use, have such machines ever been invented? who were the patentees, and at what date did they apply for the patent?—Urie's patent printing frame. It makes the exposures automatically on a strip of paper of any length. Marion & Co. are the agents for its sale. The patent was taken out early in the year 1885.

**INDIARUBBER SOLUTION.**—T. C. BIGGS writes: "Can you tell me how to make a thin solution of indiarubber for mounting? I have made several attempts, but failed, though I have used the best No. 1 benzole. The rubber I tried first was part of the tyre of a 'bike,' then some rubber tubing, but could get neither to dissolve."—The rubber tried was the vulcanised, which will not dissolve in benzole. The unvulcanised rubber must be used. The simplest thing to do is to purchase a tin of solution at any of the shops, and then dilute that with benzole to the consistence desired; it will save a lot of trouble.

**IRON DEVELOPER FOR WET PLATES.**—R. PHILLIPS says: "The iron developer I make according to the formula in the ALMANAC gets brown after it has been kept for a week or two. Is it of any use when in that condition?"—Yes, only it works a little slower. Some of the old workers prefer it in this condition, as they find it work cleaner and give greater vigour. For this reason they often use the common coppers of the shops, because the crystals are generally somewhat oxidised, and give the brown solution at once. When the crystals are much oxidised, a little more of the salt should be used in making the solution.

**MOUNTING BROMIDE ENLARGEMENTS.**—L. H. C. asks: "Would you kindly answer how bromide enlargements are mounted for painting in oils, and if the surface is prepared in any way; whether a coat of varnish first would be best; if they are permanent? and I should be glad of any other information on the subject."—Simply mount the prints with starch in the ordinary way. It will be, in many instances, advantageous to give the surface of the picture a thin coat of size, but with glossy papers this is not required. The permanence of bromide pictures depends very much upon the care bestowed upon them in their production.

**TONING FORMULA.**—H. N. B. asks: "ALMANAC, 1899, p. 944. 1. What is the toning formula with bromide of copper followed by ammonia? 2. What is Carey Lea's formula, referred to? 3. What is Schlippe's salt chemically? 4. Is the gold sulphocyanide process applicable to bromides and platintypes?"—1. Bleach the image with the bromide of copper and then darken with dilute ammonia. 2. Convert the image first into the iodide of silver, and then immerse in a five per cent. solution of Schlippe's salt. 3. Sulphantimoniate of sodium. 4. No; prints by neither process require toning if black tones are desired, and that is what gold toning gives.

**TONING AFTER FIXING; ADHESIVE SURFACE.**—VARNA says: "1. Is toning after fixing of P.O.P. and developing papers with gold or uranium permanent and satisfactory? 2. If so, do the same formulae as to strength, &c., hold good? 3. I employ Fol's formula, given in the ALMANAC. It is good for a time, but afterwards loses its tackiness, and no amount of warming, &c., will restore it permanently. Can you recommend any better adhesive mixture?"—1. Gold is reckoned the more permanent of the two. 2. No; the baths are quite different. 3. Kindly refer us to the volume and page of the ALMANAC in which is printed Fol's formula, and we will give an opinion upon it.

**RUBBER STAMPS.**—STAMPS says: "Would you kindly inform me how rubber stamps are made? Can I obtain any book of instructions? I am experimenting for the purpose of making relief stamps by a process of photography, and wish to make the stamps myself."—The method of making rubber stamps would take up too much space to describe in this column, and, moreover, the subject is not a photographic one—or one of interest to our readers. We know of no book on the subject. Messrs. Richford, Snow Hill, London, are makers of rubber stamps, and they will probably make what you require. If you were to make them yourself, you would require a vulcaniser and other appliances.

**MOUNTS.**—LUX says: "I should esteem it a great favour if you would kindly subject the enclosed card to an examination to see whether there is anything conducing to the fading or detriment of the photograph, for I have accidentally found, when mounting a picture and having occasion to remove the photograph immediately after, that a dark discolouration has left its impression on the photograph, this being evidently due to the mount. Your analysis of such matters having been so helpful to other correspondents, I trust that you will extend this favour to me. I should be glad to receive early information through your valuable paper."—We never undertake the analysis of mounts. You had better send some of them to an analytical chemist, and get him to make an analysis and report to you upon it. It does not follow that, because the back of the print was stained under the circumstances named, that the mounts would, of necessity, affect the stability of the photograph. The analyst would enlighten you on that point.

**WASHING PRINTS.**—WILLIAM PEAK says: "Will you kindly inform me what apparatus is used by professional photographers to wash large quantities of prints after toning and fixing? I have been given to understand that several stoneware sinks are used, each containing running water and a small number of prints. No apparatus made for the purpose seems to allow the water to act freely on each print without danger of tearing."—Many different forms of washing apparatus will be found in the catalogues of the dealers in photographic goods. Some prefer one form and others another. Many, perhaps the majority, of professionals prefer to wash the prints in running water, keeping them in motion by hand, and changing them from one vessel to another.

**VARIOUS.**—CONSTANT READER says: "1. Can you tell me if the following developer is correct strength for studio portraits. Of ten per cent. solutions, I take: pyro, 10 minims; bromide potass, 10 minims; soda (accelerator),  $\frac{1}{2}$  ounce; to each ounce of developer? 2. Where can I get the new show mounts with circular four-inch openings? 3. Kindly say if the enclosed portrait is properly lighted. Any information will greatly oblige."—In reply: 1. All depends upon the soda accelerator, the composition of which is not given. 2. Any of the houses that make a speciality of photographic mounts, such as Marion's, Houghton's, &c., supply them. 3. The portrait would have been better with less front and more side light, so as to have secured greater rotundity.

**THE HON. SECRETARY OF THE CARDIFF BOHEMIAN CAMERA CLUB** writes: "I have been requested by the Committee of above Club to inquire whether you have any prize lantern slides and prints that you loan to photographic societies. If so, we should esteem it a very great favour if you would loan us a few for December 14, upon which day we are holding our annual Exhibition. Many of the members have never had the opportunity of seeing really first-class work, so same would be doubly appreciated. The Club being young, anything of this description would prove doubly interesting, and such a kindness on your part be esteemed by every one."—In reply: Our correspondent should apply to the editors of our weekly contemporaries who send out sets of slides such as he describes.

**CONDENSERS.**—W. FINCH asks: "1. Is it practicable for me to make a condenser for enlarging lantern, for winter evenings indoors, with flat and hollow glasses filled with water? 2. If so, what size would be best for negatives whole-plate, and where could I get a suitable front glass? I could cut the plane side, and do remainder; if not advisable, perhaps you would kindly let me know the best or cheapest house where I could procure suitable glass for the object named and about price."—1. It is possible, but there is practically considerable difficulty in getting such lenses water-tight. 2. Eleven inches in diameter. A clock-maker would supply the glasses, such as are used for dials, but, unless you are content with very long-focus condensers, you will have to have the glasses specially bent to a greater curve than the commercial articles. The cost of these we cannot say.

**A MYSTERIOUS "NEGATIVE" PROCESS.**—TUFF says: "Will you kindly give me information in regards to enclosed negative on tin, which is done in a few seconds? I should like to know if I should require a special camera for working same, the method of working same, and the price of quarter-plate camera (if required); i.e., I have a quarter-plate now, and I am not sure if this will do. I should also like to know manufacturers if it is a special kind. Enclosed you will find addressed envelope for return of negative. I regret causing you this trouble, but I have tried in every way to obtain this information locally, but cannot."—The "negative" is an ordinary ferrotype such as is taken at fairs and such-like places. Any ordinary wet-plate camera will do for the work. Formulae for the process are given on p. 1056 of the ALMANAC. The ferrotype has been posted back to you.

**REDUCER FOR THE LIGHTS.**—COLONEL GUBBINS says: "Is there any reducer which will act on the high lights of a negative without attacking the half-tones and shadows? I was under the impression that persulphate of ammonia would act in that way, but by an advertisement in yesterday's BRITISH JOURNAL OF PHOTOGRAPHY it 'acts directly on the shadows.' I have a negative (of interior of St. Mark's, Venice) in which the detail in the high lights is smothered, whilst the dark shadows have none, or very little, and I want to reduce the density in the high lights only."—In reply: Messrs. Lumière state, in a paper published in this JOURNAL, July 22, 1898, that "persulphate of ammonia in aqueous solution has the property of reducing negatives by acting preferentially on the most opaque parts, preserving at the same time the half-tones and the shadows, which, as a rule, by the methods used at the present day, are the first to disappear."

**SALE OF NEGATIVES.**—NEGATIVE says: "Being a reader of your JOURNAL for some years, could you kindly advise me through your columns whether I am doing right? I, being a local photographer, attended a sale of a photographer a few weeks ago, and among other things I purchased about five thousand negatives with books of reference, &c.; they were bought in a separate lot, and of course I have advertised and added them to my business, but a local lawyer in the town has now sent me a County-court summons for 1*l.*; which he values four negatives of his people taken by the above firm which I have in my possession. I have looked through books and found he only paid about 10*s.* for sittings; I always thought the negative was the property of the photographer unless it were arranged otherwise at time of sitting, and there is no reference at time of sitting that he paid for negatives."—The negative is the property of the photographer. That has been decided over and over again, and any lawyer ought to know that if he keeps himself posted up in his profession. See appendix to a letter on the subject on p. 656 of our issue for October 13 last. Supposing there were any special agreement with regard to the negatives, the lawyer should know that his remedy was against the photographer who took them, and not against you. The thing looks very like a case of "bluff."



# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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## EX CATHEDRA.

THE announcement which we published last week, that General Waterhouse and Mr. R. W. Craigie are assisting the Royal British Commission in organizing a representative collection of British photography for the Paris Exposition of 1900, may obviously be understood to mean that the Royal Photographic Society and the Camera Club no longer have the matter officially in hand. The original idea was that the selection should be made by a Committee jointly representative of both these institutions; but we have been informed that the very small amount of space allotted by the Exposition authorities to British photography rendered a thoroughly representative display impossible. It would therefore appear that the Camera Club and the R. P. S. have withdrawn from the work of selection. Upon what plan General Waterhouse and Mr. Craigie intend proceeding in their task of organizing a representative display of technical and pictorial photography we do not know; but, as very many of our readers have asked us to indicate what facilities will be given to would-be exhibitors to send work to the Exposition, perhaps these gentlemen may

consider it desirable to afford some enlightenment to those interested in the matter.

\* \* \*

THE winter programme of the Society of Arts, the 146th session of which commences on the 15th instant, includes several fixtures of interest to photographers. After Christmas, a paper by Professor R. W. Wood, on "The Diffraction Process of Colour Photography," will be given, and Mr. W. H. Ward is also down to read one on "The Orloff Process of Colour Printing." On March 5, 12, 19, and 26, 1900, a course of Cantor Lectures on "The Photography of Colour" will be delivered by Mr. E. Sanger Shepherd. Two lectures suitable for a juvenile audience will be delivered on Wednesday evenings, January 3 and 10, 1900, by Mr. Herbert Jackson, on "The Phenomena of Phosphorescence."

\* \* \*

A CATALOGUE of cinematograph film subjects that has been sent us by the Warwick Trading Company, Limited, of Warwick-court, High Holborn, W.C., is of very exceptional interest. In the course of over a hundred pages we find a list of some hundreds of animated photographs of popular and topical interest, ranging from the Derby to the *Dunottar Castle* leaving Southampton with General Buller on the bridge; from scenes at the London Zoo to golf at New Luffness; from pantomime subjects to panoramic views in South Africa. The length and variety of the list is a tribute to the enterprise of the Company, whose operators are at present in South Africa with the object of obtaining cinematographic films of the doings of the gallant Britons and their "brother" Boers. The Company state that they will furnish prints from their negatives "four weeks earlier than any other concern on earth."

\* \* \*

It will have been perceived, from some remarks recently published in this part of the JOURNAL, as well as the letter of a correspondent which we inserted last week, that the cheap enlargement scheme, in one of its objectionable forms, has been adopted by some of the London press. It has, of course, made its appearance before in London, and we have traced it all over the country, and now it has returned to town. The *Sun*, an



evening paper, has been offering its readers a bromide enlargement for 6s. 6d., with the assurance that the portraits "would cost four or five times the amount if ordered through artists in the ordinary way"—that is to say that, for a bromide picture which has to bear several profits at a gross cost of 6s. 6d., a professional photographer would obtain from 26s. to 17. 12s. ! We wonder how many readers of this paragraph will devoutly wish that such a golden state of things were possible !

\* \* \*

THE *Sun's* statement, to put it mildly, is inaccurate ; and we are sorry to learn that, when remonstrated with, the inaccuracy was persisted in. The bromide enlargements which this newspaper, and its many contemporaries, sells to its readers, are worth what is got for them and not a fraction more. We have no doubt that hundreds of photographers, in all parts of the country, would be only too willing to supply them at the price. If we are sorry for the intelligence of a reading public which swallows the statement that a halfpenny evening newspaper is philanthropic enough to sell for 6s. 6d. what other people charge four or five times that sum for, we still more sincerely deplore the fact that London journalism should indulge in this sort of thing. If the newspapers *must* enter into competition with photographers, let that competition be fairly conducted. It is not fair competition to say that photographers grossly overcharge their clients. We have for years objected to this feature of the cheap enlargement trade, and shall continue doing so. Meanwhile, we must congratulate our contemporary, *The Stoge*, on its very honourable conduct in regard to a similar matter. In the advertisement of an enlargement scheme which it is at present running, the statement was made that the 12s. 6d. pictures offered its readers were worth four or five guineas. The latter part of the announcement, however, appears to have been withdrawn, to the very great credit of our contemporary, who, we hope and believe, will not on that account sell one picture the less.

\* \* \*

*Nature* states that Dr. Janssen, Director of the Meudon Observatory, has issued a circular in which he announces that the success of last year's observations of the Leonid meteors from a balloon has led to arrangements being made to repeat the experiment during the forthcoming shower. Last year, a number of these meteors were observed from a balloon above Paris, though the city itself was at the time enveloped in a thick fog. It is important that numerous observations of the Leonid meteors should be made from as many places as possible ; and, as balloons render observers independent of cloudy skies, they are evidently of great advantage upon occasions such as that to which astronomers are looking forward. Two balloon ascents are to take place near St. Denis. The first ascent will be made on the night of November 14-15, with the "Aerostat," and the second, on the following night, with the "Centaur." Two seats in each balloon will be at the disposal of Dr. Janssen, who has nominated observers to occupy them.

#### MOUNTING WITHOUT THE MOUNTS BECOMING COCKLED.

In concluding the article on "Mountants and Mounting" in our issue for the 20th ult., we mentioned that the best mountant to use for the avoidance of cockling of the mounts when they are thin is a solution of gelatine, in which the

water, to a large extent, is replaced by alcohol. At the same time reference was made to the fact that success with a gelatine mountant containing a large proportion of spirit depends greatly upon conditions, as well as upon the character of the gelatine employed.

Gelatine, it may as well be explained at once, is quite insoluble in alcohol, but, if a solution of it be made in water, spirit may be added to it afterwards, the quantity depending entirely upon the character of the gelatine used and the way the alcohol is introduced. Certain conditions have to be observed, and these we shall here explain. We may first of all say that a low quality of gelatine—that is, a low quality from a gelatine-manufacturer's point of view—is, practically, more adhesive than a high-class one, and for this reason, the latter has very quick setting qualities, and before a large surface can be coated it becomes gelatinised, and in that state it is but slightly adhesive, whereas a poor gelatine sets slowly, and a large surface can be coated while it yet remains fluid and in its most adhesive state. Furthermore, with a poor gelatine a larger proportion of spirit may be added without bringing about precipitation than is possible with a high-class one.

Take for example Nelson's "opaque" or Colignet's "gold medal,"—and these are perhaps the best and strongest gelatines made—they set very well indeed, even when the solutions are applied very warm and very dilute. It will be found that, with either of them, the addition of a very little spirit to the solutions will bring about a precipitation of the gelatine. On the other hand, poorer qualities, such as are sold as soup gelatines, will admit of the introduction of a large proportion of spirit into their solutions without causing precipitation. Therefore it will be seen that what may be the worst gelatine for one purpose may be the very best for another—in this case the end in view.

In some experiments recently made we selected as a suitable gelatine for the present purpose Nelson's "No. 2 soluble," which is a very weak gelatine. It is a very pure one and free from acid or other matters injurious to photographs, for it goes without saying that this is an essential condition in any adhesive used as a mountant for silver pictures. Two ounces of this were swelled and dissolved in 4 ounces of water. Then 6 ounces of methylated spirit, free from the mineral spirit, were added very gradually and with vigorous stirring, the solution being kept hot the while. As the spirit was added, particularly towards the end, the gelatine showed a tendency to precipitate, but, by maintaining the heat and continuing the stirring, it again dissolved. This gave an excellent mountant, and with it we mounted a number of prints in a very common album, the leaves of which were thin wood-pulp boards, such as are used for the middles of cardboard, and there was no cockling whatever. Although the solution contained so much spirit, it did not separate when it became cold. It was then remelted and 2 ounces more spirit stirred in and more prints mounted with it, this time on ordinary letter paper, and even with this there was no cockling. With this solution, when cold, some of the spirit separated and floated on the top, but, with reheating and stirring, it was again taken up.

The solution now stands thus : 2 ounces of gelatine in 4 ounces of water, diluted with 8 ounces of alcohol. It should be mentioned that the spirit must be added very gradually and with constant stirring, and the solution kept at a tolerably



high temperature the while, otherwise the gelatine will be precipitated as a clot, which it will be difficult to redissolve. It would be better to warm the alcohol before it is added, as that will facilitate matters considerably. It will be seen, by comparing this mountant with the formula given in the ALMANAC, that there is a wide difference in the proportions of spirit and water, and that a different gelatine is employed. In the latter there is but one-third the spirit that there is of water, while in the former there is just twice the quantity of spirit there is of water. The advantage of this, when the causes of cockling, as explained in the previous article, are considered, will be manifest, as this mountant is almost a dry one.

The solution must be applied quickly to the dry print, as it soon sets, and for this reason, when large prints have to be dealt with, a large brush should be used; a flat hog's-hair varnish brush is a very suitable one for the purpose. Here is another point that requires attention, the print should be put, in the first instance, exactly on the place it is to occupy on the mount, as, by reason of the great adhesiveness of this mountant, it cannot easily be removed after it is once in contact with the mount. Glycerine would retard the setting of the gelatine and make the solution easier of application; but, owing to its hygroscopic properties, its use is not to be recommended for silver photographs.

This mountant, by reason of the small proportion of water it contains, renders it very suitable for prints that have been squeezed on to glass when it is desired to retain the gloss. This solution will keep good for a very long period, as the alcohol acts as an antiseptic, but it should be kept in well-corked bottles to prevent the evaporation of the spirit. It is a good plan, when a large quantity is prepared at a time, to put it into smaller bottles so as to avoid having to heat up the whole bulk every time mounting has to be done.

**Photography at Low Temperatures.**—Some time ago we gave a brief account of Professor Dewar's experiments with dry plates exposed at a low temperature, only twenty per cent. of the action shown at 60° on other plates taking place at 182° C. He has pursued the subject still further, and gave an account of his results in a lecture delivered before the Royal Institution a few months ago. Using a sixteen-candle power lamp, an ultra-violet magnesium and cadmium spark discharge, and a Crookes tube, he exposed plates, cooled by liquid air and uncooled, with the result that when the ultra-violet light was used, only about six per cent. of the action given at ordinary temperatures was brought about; when the other two lights were used, about seventeen per cent. of the light action was indicated in the developed plate. Professor Dewar said it was possible that the ultra-violet radiation is dissipated by the photographic film at low temperatures to a greater extent than at ordinary temperatures, through absorption and subsequent emission as a phosphorescent glow. He further thought it possible that the photographic action took place during the heating up after the low-temperature exposure, as the result of an internal phosphorescence. He considered that a more elaborate study of photographic and phosphorescent effects at low temperatures would add much to our knowledge of the chemical and physical actions of light.

**Photo-crystallisation.**—In the *School of Mines Quarterly* is a paper by Ferdinand G. Wieckman, Ph.D., describing some singular effects of light in inducing crystallisation. The substance employed was sucrose in solution, four parts to one of water, and partially inverted by dilute hydrochloric acid at a temperature of 80° C. A large number of solutions were made with the above solution, both in its condition as described, also with the acid accurately neutralised. The result was that, after exposure to direct

sunlight, the flasks containing the solutions were solid with crystals (after 135 days' exposure), while similar flasks kept in the dark were apparently unchanged, not one crystal being formed. A long list of results under various conditions is given, and the net result is that light has some especial action in bringing about a crystalline formation, a fact which it is evident may also help in forming an opinion as to the mode of its chemical and physical action.

#### ON THINGS IN GENERAL.

I SUPPOSE anybody who is anybody has been to the two so-called "photographic" exhibitions. Time was when I used to anticipate no small amount of pleasure from a visit to such an exhibition, or rather, I should say, to an exhibition of photographs. One liked to compare notes on lenses, on processes, on dry *versus* wet, and so on. Every now and then a new lens was put upon the market, and most of us were anxious to see results, and ascertain to the utmost the capabilities of the new instruments. But now all this has changed. An exhibition was started, in which the name of photograph was, indeed, invoked; but the views and studies therein shown were avowedly free from indebtedness to any amount of technical skill in photograph-taking, lenses were not necessary, good photographs were rejected, and the more extravagant the pictorial aim, and the more indefinite its execution, the greater the chance of the picture being hung. It was a new thing entirely. Some very good men took it up and, of course, it became a success, and its modes a fashion. Photographers generally have not stiff backs, and too many of them embraced the new style. They threw to the winds their laboriously acquired dexterity, and saw fame and glory awaiting them by embracing the novelty which, so lacking in a sense of proportion are some people, has actually been termed a school. And now we have it virtually admitted that indistinctness of outline makes a photograph all the nearer to fine art, nay, a branch of it, and the very essence of photography, truthfulness of outline and faithfulness to form, ignored and disgraced. Naturally a reaction will take place. It has, however, not yet begun, and the bastard production of photographic processes, degraded and abused, still attracts the photographic multitude, and that thing, apeing a painter's results, is most lauded when it least resembles a photograph and is most like a painting, but in its likeness how unlike! Let any one go to that other Exhibition and he will see yards of paper covered with various shades of various colours made to look as much like brushwork as the producers can bring about. But these imitators, with fatuous complacency, do not stop at this point. They copy the brush men in devising frames the very opposite of what they were wont to employ. We all know that the water-colourist paints now with such brilliancy and solidity that his pictures easily stand the immediate proximity of a gold mount, such as would ruin the effect if employed with the type of painting of the early part of the century, and so the new photographer has devised a new style of frame, and utterly abandoned a white margin. In some cases such a frame is capable of being a distinct gain to the effect of a photograph. But, alas! though it is so in only a few cases, the many have adopted it and clothed their pictures with sombre, heavy surroundings that kill the shadows and make the whole grey and flat, simply because of their following a fashion like a flock of geese, and without brains to devise or minds to originate. This is the cause of the woful depression that every one feels after half an hour at Pall Mall; the fatal legacy of the Salon appears to have crushed out all originality, and the inept blind followers of a mere fashion have rendered themselves a laughing-stock. I have no intention of bringing in names, or I could instance dozens of photographs that would appeal to the eye with ever so much more force if their present sombre, mournful, ill-suited mountings were removed and replaced by others more in keeping with their scale of shades. Photographers, be men, and think, and cast off this vain phantasy of imitation painting and absurd framing!

I feel very strongly on this question, and had better leave it ere I commit myself. I will turn to something refreshing and stimulating, and no anecdote, perhaps, could be more so than one which has recently again been brought forward after being, I thought, dead



and buried, though it was a pity, for I always liked that story. There was a fire at a laundry, a big blaze from fifty gallons of ignited gasoline. There was a good young man next door who kept an apothecary's shop; seizing a demijohn of ammonia, holding a gallon and a half, he hurled it in the blazing laundry. In spite of its wicker covering it smashed, liberated the ammonia, and in the twinkling of an eye the fire was put out. This is all easy reading, but listen to the sequel: "So completely was the fire extinguished that workmen were enabled to enter the room almost immediately." Now, if it had been sal ammoniac that had been thrown on to the fire, the result above described might have followed, but that workmen could enter a room almost immediately after a gallon and a half of ammonia had been thrown about is simply ridiculous. Let any one try, without a fire, and throw even a pint of ammonia on the floor, and see whether he could enter the room almost immediately; but a dozen pints! No! Let me advise photographers not to lay in a stock of demijohns of ammonia for putting out possible fires!

I want to know something about this new "photo-sculpture." Will not some kind reader of this JOURNAL give a few words of instruction? I have read the description many times over, but cannot make head or tail of it. I remember the old photo-sculpture method, run, if I recollect aright, by one of the great photographers of the day—Disderi—perhaps about a quarter of a century ago, but then he had cameras all round the room, with the sculpture in the middle; but in this new affair there appears to be but one camera. "The sitter is placed in front of a suitable background, and, by means of zonal masks and a series of arc lights, a shadow is cast upon the sitter from all sides." So I read it lately, and a similar wording has appeared in sundry other papers. What I want to know is, how can I cast a shadow from all sides?

Wellington films may be, and very likely are, destined to become a power in the land of photography, but it will do no good to them to bring forward hazardous statements about their merits. I read that they prevent halation; but there are various sorts of halation, and I see no reason for these films being any better than celluloid films in regard to, at any rate, the most important type, that from reflection at the back of the plate; and, as to celluloid films being free from it, I can say the idea is a pure fallacy. I have developed hundreds of rolls of films during the last twelve months, and have repeatedly met with examples of halation. Theoretically, of course, they should be free from the effect; but, unfortunately, they are not free.

There has been much talk lately of cloud pictures and isochromatic plates, and every one knows that, with the aid of a screen and such plates, clouds can be obtained along with the landscape, but one point in the matter is entirely lost sight of, some of the most beautiful cloud effects are obtained when the amount of sky visible is very slight, and the cloud forms are mainly indicated by light and shade on their own masses. Now, when it is remembered that the shadows in the landscape derive their illumination almost wholly from these clouds, that they are, in fact, the source of the illumination, the problem that is really presented is to take, on one plate, an object and its source of illumination; no amount of screen use or adoption of isochromatic plate will influence the relative intensities of illumination, and, though such "skies" may be included, they must of necessity be over-exposed.

I was greatly interested the other day in my perusal of Mr. Mummery's paper, "Doubtful Tendencies." It is full of sober common sense, and remarkable for its freedom from the usual art jargon about quality, tonality, values, &c. We can get plenty of value and truth in our work, and can put into it our personality and our feeling; we can exercise design and invention, we can, within a restricted area, cause it to ring with the true tones of fine art, but we get nauseated with the continuous stream of high falutin talk about the art aspects of our hobby. We want more about our processes and less about our high aims. "Damn your sentiment," said Charles Surface, and many of us would speak in a similar strain about photographic sentiment.

I have just written about Disderi, and this reminds me that, in tracing back the originator of dry mounting as applied to photographs, I can remember seeing at Disderi's place in Brompton, over thirty years ago, heaps of prints—*cartes-de-visite*—that had been

pasted on their backs, dried, and cut, ready for the dry mounting" which is commonly supposed to be quite a recent introduction.

Captain Abney's paper on "Thickness of Film," read at the Camera Club the other day, treated a topic of great importance, which he illuminated in his usual masterly fashion, bringing out considerations and points of view well calculated to make us think, and equally pregnant with food for discussion. In the remarks that followed, Mr. Cadett struck home when he alluded to the complaints of the amateur about slow fixing and drying when plates rich in silver were employed. The highest quality in dry plates cannot exist side by side with thinness of film and poorness of silver constituents. One of the most popular of dry plates owes its enormous sale, not to its innate excellence so much as to the fact that it is very regular and uniform, and fixes quickly.

The review in these pages of the Industrial Exhibition of Edinburgh, and the reference to an exhibitor who exhibited other persons' photographs in his own name without troubling to remove the actual producer's name from their surfaces, reminds me of a similar incident quite honestly brought about. Seeing that, after the fashion of dog shows, promoters of photographic exhibitions have introduced a "challenge class," so it is probable inexperienced exhibitors may lend photographs to photographic exhibitions in the same way they would send photographs of dogs to a dog show. Some little time ago a gentleman for whom I had made some dog photographs said to me, "Oh, Mr. Free Lance, I dare say you would like to know I have taken another prize, this making the third, for that photograph of my dog you made for me!" This sounded very cool till I remembered it was only at a dog show, where owners and not producers of the exhibit obtain the prizes.

FREE LANCE.

## SILVER SUB-BROMIDE.

[Translated from the Photographische Mittheilungen.]

NOTWITHSTANDING the extensive and thorough investigation of this subject, it has hitherto been impossible to demonstrate the existence of the argentous oxide combinations with certainty.

Ever since Scheele's time\* the substance produced by exposing silver chloride to the action of light has been studied, but no one has yet produced it in a pure state. Early investigators noticed that chlorine was liberated when chloride of silver was exposed to the action of light, and it was inferred, correctly, that some combination poorer in chlorine, that is to say a sub-chloride, must exist, for it was impossible to detect any pure silver in the exposed silver chloride.

The fact that the silver haloids only suffer a superficial change when exposed to light renders the chemical investigation of the resultant substance far more difficult.

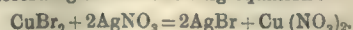
It is not my purpose to consider here the products of decomposition due to the action of light upon the silver haloids, but rather the preparation of the silver sub-haloids by purely chemical means.

The method of preparation of silver sub-chloride generally given in text-books of chemistry is that first described by Wetzlar. (There are no directions as to silver sub-bromide and sub-iodide). Wetzlar's method consists in subjecting silver foil to the action of chloride of copper or iron. But I have found that this process yields principally silver chloride, and that only a small quantity of silver sub-chloride is formed at the initial stage.

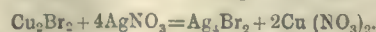
I have also treated finely divided silver, prepared in several other ways, with chloride of copper and bromide of copper. In the early stage a greyish black substance is always formed, which afterwards gradually turns to white silver chloride or pale yellow silver bromide.

Investigations concerning the bromide of copper intensifier, which is extensively used in the wet-collodion process, led me to study the action of silver nitrate upon sub-bromide of copper.

By the action of bromide of copper upon nitrate of silver, bromide of silver is formed according to the following equation:—



But, if sub-bromide of copper be used instead, then sub-bromide of silver ( $\text{Ag}_3\text{Br}_2$ ),† must be formed according to the following equation:—

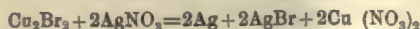


\* *über Licht und Feuer*, 1777.

† In conformity with the expression of  $\text{Ag}_2\text{O}$  for argentous oxide, I express silver sub-bromide by the formula  $\text{Ag}_3\text{Br}_2$ .



or, falling this, silver plus silver bromide according to the following equation:—



For the purpose of this experiment I first prepared some sub-bromide of copper by boiling copper shavings in a solution of bromide of copper, and pouring the green fluid into about ten times its quantity of boiled water mixed with acetic acid. In this way a nearly pure white powder is obtained, which is sub-bromide of copper. It must be used at once, otherwise it soon turns green, due to oxidation from exposure to air.

The sub-bromide of copper, after having been washed with water and acetic acid, was quickly dried and then treated with a ten per cent. solution of silver nitrate, care being taken to exclude the action of air as much as possible.

The white sub-bromide of copper quickly changed to a dark greyish-black substance. After washing and drying the fine granular substance was found to be quite free from copper.

An analysis was made, and the substance was found to correspond exactly with the formula of silver sub-bromide ( $\text{Ag}_2\text{Br}_2$ ).

Sub-bromide of copper prepared by other methods was also submitted to the action of a solution of nitrate of silver. The same grey-black substance corresponding to the formula of silver sub-bromide was obtained in each case.

I then treated sub-chloride of copper and sub-iodide of copper with an excess of silver nitrate solution, excluding the action of air. These sub-salts were prepared in the same way as the sub-bromide of copper, by reduction from chloride and iodide of copper solutions. Again the result was a grey-black compound, free from copper, which, upon analysis, was found to correspond with the formula of silver sub-chloride. The preparation of the chlorine compound, free from copper, was more difficult, owing to the crystalline nature of the sub-chloride of copper and its great affinity for oxygen. Moreover, the pure white sub-chloride of copper was found to be very highly sensitive to light. Placed in a well-corked bottle, and then immersed in water mixed with acetic or sulphurous acid, and exposed to sunlight, the substance soon turned black, and assumed a metallic lustre.

The properties of the three compounds—sub-bromide, sub-chloride, and sub-iodide of silver—were then investigated rather more closely. The substances were unaffected by air, and changed but little upon exposure to light. In order to ascertain the important fact, whether free silver and silver bromide were present or not, the substance was treated with mercury. Any free silver present would amalgamate with the mercury, and, as no trace was discoverable after the mercury had been allowed to act for a considerable time, the experiment was in favour of silver sub-bromide. Upon treating the three substances with nitric acid (1-3), silver was taken up, and silver bromide, chloride, and iodide remained. Upon separation of the silver haloids from the solution of silver nitrate, they were not found to differ from haloids prepared in the ordinary way.

Eder has instanced the reduction of silver sub-bromide to silver bromide and nitrate of silver by the action of nitric acid as a reaction that cannot be called in question. In accordance with it, this reaction cannot be taken as evidence against the possibility of the existence of the silver sub-haloids.

As the chloride and bromide of silver, discoloured by the action of light, are not decomposed by nitric acid, which should be the case with sub-haloids, it seems probable that very intimate combinations of chloride and sub-chloride, bromide and sub-bromide, are formed which are indifferent to nitric acid.

Hypsulphite of soda decomposes all three substances, dissolving the bromide, chloride, and iodide of silver, and leaving a residue of pure silver.

Liesegang has already referred to this property of the silver sub-haloids.

The three substances were found perfectly homogeneous under examination with the microscope, which is confirmatory of their being true chemical compounds.

Upon moistening a small particle of silver sub-bromide with strong nitric acid whilst under the microscope, the separation of pale yellow silver bromide could be distinctly observed.

Should it be proved, nevertheless, that these are not true chemical compounds, but mere admixtures, I think the closer examination of the properties of mixtures of this intimate nature will still be of some importance.

In the other case an easier and more certain method of preparing the silver sub-haloids will have been shown.

DR. OTTO VOGEL (Zurich).

## THE COMING METEOR SHOWER.

BEFORE the issue of our next number the whole civilised world will have been interested in, and, we may hope, have had an opportunity of witnessing one of the most astonishing and beautiful natural phenomena possible ever presented to human vision, and, we doubt not, many hundreds, perhaps thousands, of cameras will have attempted to record some of its phases, providing, that is, that we have a comparatively cloudless sky in the early morning of November 16 next. The odds, however, against a November night being cloudless are about three or four to one. In November every year we have on certain nights an unusual number of "falling stars," but about every thirty-three years the number visible is increased a thousand, nay, ten thousandfold—a veritable shower of stars. Those who, like ourselves, had the good fortune to witness the last display of celestial fireworks had before them a sight to be remembered to the end of their life. It was not a star here, then another, and a further one; the whole heavens were ablaze with brilliant shooting sparks, apparently diverging in all directions, but, to the expert eye, traceable in their origin to a particular quarter of the heavens as their starting point. The explanation of their presence is not difficult. A clump, so to speak, of myriads of dark bodies—disrupted portions of other heavenly bodies—of various sizes is perpetually going round in a particular orbit, the whole of the orbit being further sprinkled, as it were, with detached members of the main clump, which takes about thirty-three years to go once round. The earth, as we know, goes once round in its own orbit in one year. The two orbits almost touch at a certain point, and, when the main clump happens to pass just when the earth is at the touching point, some of these invisible flying fragments enter our atmosphere and quickly become white hot through friction with the air, and are dissipated into dust and vapour; sometimes they actually fall on the surface of the earth.

Picture an immense elliptical circus ring with horses going round once in thirty-three years, also another smaller ring separated by the slightest distance only from the larger, and with a single horse going round once a year. The single steed would know nothing of the others in a general way; but once every thirty-three years, as the group approached where the two rings touched, they would nearly come in contact, and the flying sawdust from the heels of the galloping group would plentifully bespatter the lonely steed. In this analogy we may take the sawdust to represent the stars we hope soon to see. They have the effect of radiating from a particular direction—the quarter of the heavens occupied by the constellation Leo, hence the term Leonids; but, as they are comparatively near to us, the effect of perspective gives a false impression of their direction, just as we can see the sunbeams shining in the distant landscape through a rift in the clouds, and, though really parallel apparently, radiating from a light some half dozen of miles or so away. Still Leo is the quarter to direct attention to—or, rather, the group of stars called the "sickle," or reaping hook, at one end of the constellation. At midnight this will be near the east, slightly to the north. As we do not doubt, some of our readers, who yet feel interest in the expected star shower, have not given much attention to astronomy, we may say Leo may be easily found in the following manner. Every one knows the Great Bear constellation, or Charles' Wain, and the pole star almost immediately overhead, in a line with the last two stars of the Wain; well, joining the leading horse of the Wain by an imaginary line to the pole star, and from the latter taking another line of equal length towards the east, down nearly to the horizon, just so as to make, with a third line starting from the leading horse, and running almost parallel to the horizon, an equilateral triangle, we shall find the point of the sickle at the remaining corner of the triangle; its shape is unmistakable.

To photograph the stars, the best plan would be, when they begin to "exhibit," to place on its tripod a camera, preferably one with an anastigmatic lens, at full aperture and focussed for distance. Insert a plate, and take off the cap for a few minutes, noting the exact time, and repeat this at intervals, with a fresh plate each time. The brighter fixed stars will show their position by a "trail," i.e., a short line, and any particularly bright meteor, taken by several observers at different parts of the country, could have its direction and distance accurately determined by an astronomical expert who had the plates to collate, the time of exposure being pencilled upon them.

As the presence of clouds would be a fatal bar to the visibility of the display, many earnest astronomers are intending to utilise balloons to take them above any probable cloud difficulties. Dr. Janssen, of the Meudon Observatory, announces that an experimental trip, successfully tried last year, to observe the Leonids, will be repeated on the present occasion, two ascents will take place from St. Denis on November 14-15 and 15-16, and seats will be reserved for astronomers of note, regardless of nationality.



### ORTOL, WHOLESALE DEVELOPMENT, REPEATED USE OF DEVELOPER, AND OTHER THINGS.

THE death of pyro has so often been foreshadowed, that it makes the experienced worker careful in committing himself to similar statements; and in this respect matters are worse now than ever, because the numerous attacks successfully withstood render the position of pyrogallic acid as a developer the more unassailable. In the early days we had but two reasonable developing agents for bromide dry plates, pyro and ferrous oxalate. The latter found but very few adherents in this country, the great mass of photographers turning to the former. During the following years all sorts of changes were made in the component parts, not only in relative proportions but in the accelerators also, and yet pyrogallic acid remained. It appears to me that the reason must rest between the two suppositions, either that pyro is really the very best reagent we have ever had, or that the more modern developers have not received the same amount of attention.

One can easily understand that, with only one good developer to deal with, it was thoroughly sifted and experimented upon. If any readers will turn up the back numbers of our periodicals and annuals, they will be quite surprised at the number of formulæ and suggestions. We have used ammonia, soda carbonate, potash carbonate, yellow prussiate of potash, and others. Pyro has had twenty or thirty years' experimenting, and for many years stood practically alone as a developer for dry plates. Before we could give any modern developer even elementary attention, another reagent would be put upon the market.

We must also remember the conservative feeling that exists very strongly amongst those, perhaps, whose interests are purely commercial. If they have got a good developer, why change it? Yes, why? Of course I am not prepared to say that, even with the experience and testing of a modern developer, it would be found equal to pyro. But what I wish to point out is, that probably the disinclination to change has as much to do with the position of pyro in public opinion as its supposed superiority.

As a user of and believer for many years in that reagent, far be it from me to cast even a shadow of suspicion upon its virtues, and I confess, that up to the present, not one of the developers introduced since pyro has been equal to it as an all-round first-class developing agent. Minor advantages have been gained, there can be no cavilling at this statement; skirmishes have been successful, but, when the main battle has come off, pyro has always won.

I make the assertion that, if any developer will shake pyro to its foundations, it is ortol. It is no use saying that it will take the place of the other, because there are many professionals *who will never change*; but I'll guarantee that, if ortol be given a three months' earnest trial, spread over all classes of work, the dear old pyro bottle will quickly find its way to Stevens'.

It was once rather humorously put, at a meeting where I was discussing ortol, that it was good because it was so like pyro. Well, there's something in this, as the working of ortol very much resembles the other, and the ultimate results closely approximate.

Having got so far, it is necessary that I at once make clear my position. In the old days, with hydroquinone, say, some one at once assumed the prophet's mantle, and foretold the doom of pyro; and as each new developer came out there was always some enthusiast to laud its praises up to the skies. Now this rôle I have not taken up at all. In 1892 (*vide* "The Hand Camera and How to Use it"), in contrasting hydroquinone with pyro, I said the former "had not come to stay," and of eikonogen, "I cannot deem it either good enough, or reliable enough, for every-day work." Readers must please excuse the reference to my own writings, for I want them to see that at no time have I been a jumper at new developers; nor have I in any sense jumped at ortol. I use the phrase, "jumping," as characteristic of statements made upon the spur of the moment and after very slight trial. And I can go further, and say that rodinal, metol, and others, as well as combinations of these, and other reagents, have received at my hands prolonged and painstaking investigation. And here let me add that my work with ortol, as with other developers, has been entirely of the commercial or practical nature, not the scientific or analytical tests. These latter I have always considered to be simply useless for every-day work, and oftentimes very misleading indeed. A developer to succeed must be able to be used by others than scientists with a laboratory behind them, and their opinions, from the every-day work point of view, are worthless.

As to my own credentials, my remarks are founded upon a three months' constant use of ortol, with plates, films, and papers, partly for work that had to be done, and partly for my own experiments. Let us

just look for a moment at what I have done solely with ortol during that period.

- 100 hand-camera films, Belgium Trip.
- 120 " " plates, " " up to 23 x 17.
- 20 bromide enlargements, " " "
- 400 bromide prints " " "
- 60 lantern slides " " "
- 6 Biokam films " " 25 feet long each.
- 350 lantern slides, various,
- 200 half-plate bromide prints, " chiefly half-plate.
- 150 bromide prints, 11 x 5.
- 90 transparencies, quarter, half, and whole-plate, on process plates.
- 45 cloud negatives on ordinary and isochromatic plates up to whole-plate.
- 2 gross cloud negatives, quarter, half, and whole-plate, on films.
- Several transparencies and enlarged negatives up to 12 x 10.
- About 200 hand-camera quarter-plates, various.
- " 60 half-plates, various, portraiture and landscape.
- " 12 rollable films, various sizes.
- " 50 bromide enlargements, 12 x 10 chiefly.

These are what I can remember; but, of course, there have been many little odd things. The whole of the above were developed with ortol, and, although the busy professional may laugh at the above as being work at all, yet I think it is enough to test ortol with, and, moreover, all the work up to the final washing has been my own, absolutely unaided.

In dealing with ortol I have approached the subject from three points of view—careful experimental, every-day work; and, lastly, the slapdash, or wholesale. This latter will explain the second part of the title of this article. The few experiments satisfied me, and thereupon I tackled the second and third ideas, as it was these I was aiming for. The experiments are not worth troubling the reader with, as they by themselves prove nothing of any value. It is the conclusions drawn from these and put into considerable practice that will interest. Perhaps the word "slapdash" is hardly a happy one, as I do not mean gross carelessness, but merely the power of rushing through a lot of work in a very short time and without much attention to each particular plate. I shall, however, deal with this subject more fully later on.

Now, what can be claimed for ortol? I will set them out as attractively as I can, but, mind you, truthfully as well.

1. Gives practically same results as pyro, in colour, gradation, and in the building up of the image, and in final result is, if anything, superior as regards fineness of delicate detail.
2. It allows of every modification that pyro does, and some more.
3. The use of a minute portion of hypo is a decided advantage.
4. Can be used over and over again without detriment, and keeps well even after use.
5. Cheaper than pyro.
6. Does not stain plate, paper, or fingers, even when old.
7. Is excellent alike for plates, films, lantern slides and transparencies, and bromide paper.
8. It has a very powerful continuing action.
9. Absolute absence of frilling.

Before dealing fully with these points in detail, it would be well to touch upon the actual formula. Those given by the makers are both very good, and the difference between them is merely a matter of soda and potash. There is not enough distinction between these to warrant comparison. If anything, with potash the development is just a little slower, and the result slightly softer, given equal quantities, but beyond that the matter is not worth our attention. I have generally used soda, but that has been only because I happened to have a quantity by me. I give the maker's formula and the quantities I have always made up, the idea being to utilise the whole ounce of ortol.

#### SOLUTION A.

Water (cold) .....	10 ounces.	60 ounces.
Metabisulphite of potash.....	35 grains.	210 grains.
Ortol .....	70 grains.	1 ounce.

#### SOLUTION B.

Water .....	10 ounces.	60 ounces.
Carbonate of soda (crystal) } 1½ " "	7½ " "	
or		
Carbonate of potash } ½ " "	3 " "	
Sulphite of soda (crystal) ... 1½ " "	10½ " "	
Bromide of potassium .....	5-10 grains.	30-60 grains.
Hypo solution (five per cent.)	50 minims.	6 drachms.



Equal parts give quick development and vigorous results; by adding one part of water development is slower and the result softer, given, of course, the same exposure to deal with.

The above developer works admirably in every way, and, although I experimented and decided upon another form, I did so, first, to make it simpler to mix up; and, second, to obtain greater modification. The purpose of the sulphite is merely as a colour preservative, and, as it somewhat slows the action and has a slight tendency to harden the result, I simply set about having it as a separate solution. The action of the hypo solution is rather curious, and led me to drop the idea of that being a separate bottle also. Half the quantity appears to act just as well, and a little more does no good, whilst too much merely gives fog. To save a fifth bottle I therefore put the hypo with the carbonate of soda, although, of course, I have the solution always in stock, and to work to the very best advantage the hypo should be separate; but, as in order to get greater modifying power I had to increase the number of bottles, whilst all the while trying to simplify so as to attract the busy professional to "have a try," I have left the hypo with the carbonate. Here, then, is my own formula, which, being stated in ounces, needs no calculations as to "parts."

## ORTOL.

Ortol .....	1 ounce.
Metabisulphite of potash .....	$\frac{1}{2}$ "
Water .....	60 ounces.

## SODA.

Carbonate of soda .....	8 ounces.
Hypo solution (five per cent.) .....	$\frac{1}{2}$ ounce.
Water .....	30 ounces.

## SULPHITE.

Sulphite of soda .....	10 ounces.
Water .....	40 "

(A saturated solution really.)

## BROMIDE.

Bromide of potassium ..... ten per cent. solution.

As I have before stated, the sulphite of soda is merely a colour-restrainer, and therefore the separation of it from the carbonate gives the power of altering the colour of the deposit. It also serves another purpose, viz., its omission quickens the developing action, as sulphite is a restrainer.

In actual work the only question to deal with is as to the colour of the negative. With some people, or at least with most of us in some cases, the colour does not matter. Well, then, for speed and comfort, with a resulting negative very much like pyro ammonia, use as follows:—

Normal exposure, vigorous negative: ortol, 1 part; soda,  $\frac{1}{2}$  part; sulphite,  $\frac{1}{2}$  part; bromide, 2 to 3 grains per ounce. Normal exposure, softer negative: add 1 or 2 parts of water to above. Over-exposure: ortol, 1 part; soda,  $\frac{1}{2}$  part; sulphite,  $\frac{1}{2}$  part; bromide, 5 to 10 grains per ounce. Under-exposure: ortol, 1 part; soda, 1 part; water, 3 parts.

For blacker images nearer to ferrous oxalate or hydroquinone, more sulphite must be used, and, as that is increased, bromide can be reduced. For browner deposits, omit the sulphite altogether and increase the bromide.

After the negative is fully developed, a good way to obtain the very finest detail is to flood the plate quickly with a weak solution of soda, say, 1 part of the solution to 5 or 6 parts water. It must not, however, be allowed to remain too long, and the plate must be quickly immersed in the fixing bath.

Ortol has a greater continuing action than any other developer, which means washing in water does not stop; in fact, with a fairly full-exposed plate, nothing short of the fixing bath will stop development. The advantage of this I shall show later, but it may not be desired, and therefore it is necessary to give the warning. If, after development, the negative be washed for any length of time before fixing, it will gain in density, and, if the gain is not wanted, the fact must be remembered. So great is this continuing action that a fully exposed plate may be removed from the developer as soon as the detail is fully out, and placed in plain water to finish. Indeed, I have frequently placed such negatives under the direct stream from a tap with the same result.

Another claim I have made for ortol is that it is cheaper than pyro. Yes, I know ortol is 2s. 6d. an ounce, and pyro 10d., but even then I should call ortol only about half the price. And what it will be later when the increased demand justifies a lower price, can only be surmised. It is cheaper because one solution will develop eight plates, one after the

other, very comfortably. I usually myself do more than this, but will put it mildly. For instance, with two ounces of solution I have developed twenty-two half-plate bromide prints (one only at a time), and could have gone on further, but there were no more prints. Now, neither pyro soda nor pyro ammonia will develop eight or ten consecutive plates without a marked difference in the results, to say nothing of stain.

I had some Biokam films, twenty-five feet long, to develop, and, although the frame goes into a 12×10 dish, I found it would require forty ounces of solution to properly cover the film. Now, you know I buy most of my chemicals, and forty ounces of solution rather made me scratch my head and cogitate a wee bit, so I went on developing plates and films at intervals, and as each solution was changed I put that used into a forty-ounce bottle. As soon as I got the forty ounces together, I tackled the films and got first-class negatives, as good as could be wished for. Later on, say a fortnight later, I used this old developer again as a starting solution for a big batch of transparencies and lantern plates. One got left in accidentally, and I found it as good as those finished in the new developer. I made a note of this, and about a month later purposely tested it in this way. I had a dozen whole-plate negatives to make from one transparency, and, being by contact with exposure to artificial light, it was perfectly feasible to give the whole dozen each the same exposure. I placed the frame far enough away from the gas to allow of sixty seconds, so that, if by any chance one of the exposures should vary half a second, it would not matter. Four of these films I developed in a freshly made developer, four started in the old solution and finished in fresh, and four left altogether in the old. I placed an old finished negative in the dark-room window, and, as soon as the development of a certain portion reached the density of another certain portion of the negative, it was at once plunged into the fixing bath. I purposely avoided washing, so as to eliminate any uncertainty in that direction. The result was, I could not detect one from the other in the whole twelve when dry.

Now that developing solution consisted of forty ounces of used solutions, nothing added to it, and the last-used solution put in the bottle was quite two months old. About half of it would be three months old at least; and a curious feature of used ortol is that it discolours very little with age. If we empty a used solution into a glass bottle, it will be found of a ruby tint, which in a few hours darkens somewhat. After this no further change takes place. The forty-ounce solution already referred to is no darker in tint with three months' bottled-up existence than when it had stood the first day, nor has the subsequent use of it as detailed made any alteration. Moreover, it is quite clear and bright, although of a rich ruby colour.

Readers will have already gathered from the foregoing that ortol fulfils another advantage I claim for it, viz., that it does not stain the film. If it had done so, four of those whole-plate negatives should have shown it at least, if not eight of them.

Nor does it stain the fingers. I have not taken the least trouble, but after weeks of using new and old solutions, rarely a day passing without some immersion of the fingers, and, upon some occasions, as much as three or four days in succession, from 9.0 a.m. till nearly supper-time constant immersion, there was only a faint slight yellow tinge on two nails and the first finger of the right hand, just those used most of all.

It is not quite allied to my subject, and yet it may be useful to relate my method of dealing with unknown exposures. I use four dishes, containing respectively old-used solution, freshly mixed solution, plain water with a lot of bromide in, and one nearly all carbonate of soda and very little ortol. I judge by the relative time of appearance of the image in the old solution. If exposure is right, it is finished off in the freshly mixed developer; if over-exposed, it is put into the plain water and bromide; if under, it gets a soaking in the strong carbonate solution, and possibly later returned to the new or old solutions to finish density. Very often, too, I have a large tray of plain water, into which to get rid of those developing right (continuating action again) whilst I get on with others.

Harking back for a moment to the keeping power of used ortol solutions, I ought to have said that throughout tap water was used, and even this has to pass through a large cistern on the roof before it honours my dark room. Whether distilled water would make a difference in the colour of the old solution or aid its keeping powers, I am therefore unable to say.

There was a discussion a short time ago at one of our societies as to the advisability of using a developing solution more than once. One member said it was the right thing to do provided the results were the same, but he afterwards added that they never were. This was a diplomatic utterance worthy of a Prime Minister or the editor of—well



never mind. It is open for any one to try for themselves with ortol. That is one point.

Another is as to the continuing action. Let me tell any reader desirous of testing this a very good way to do it. Take a transparency plate, expose fully under a negative, and cut the plate in half after exposure. Place the two halves in the tray and pour over the developer, and proceed with the operation until dense enough. Pour off the developer, and quickly remove one half direct to the fixing bath, putting the other under the tap for a few minutes, which in turn must also be fixed. You will soon prove that point.

The advantage claimed last for ortol, but by no means the least, is a complete absence of frilling. In the whole of the work enumerated earlier on there was not the slightest trace of a frill. But, in addition, I had the opportunity of putting this matter to a very severe test. It was upon one of those very hot days about the end of July or beginning of August, the day described in the newspapers as the hottest of the year, or the hottest for ten years, or something of that sort. Any way, it was hot enough for me with all the windows and doors open, and what it was in my small dark room, with gas burning inside a good deal of the time, I do not know. But I had to give up toning a batch of P.O.P. as the surface of the prints melted almost without being touched. The cistern on the roof had been carefully watched with mistaken zeal by the blazing sun all day, and the water was warm as it emerged from the tap. Now, I thought, is the time to try for frilling with ortol. I thereupon developed a dozen quarter-plates, and, after fixing in plain hypo, put them to wash side by side, and flat upon the grid in the sink. The water from the tap fell upon one negative, and, as all the edges were touching, of course spread all over the others. Now, with a strong stream of water, there is no better method of causing frilling than by this way of washing, there being always the tendency on the part of the water to catch the edge of each plate as it passes. But upon that occasion I had none; and, if ortol produces negatives that will stand that, then, in the words of the song, "it will stand anything."

WALTER D. WELFORD.

(To be continued.)

## CURRENT PHOTOGRAPHIC TOPICS.

[Abstract of President's Address to the West London Photographic Society.]

We wish to take up the science and practice of photography. Well and good. Now, shall we be content to remain as mere dilettante amateurs, or shall we strive each to become a master in some one or other of the many branches of the art? If the former, I beg that we may at once give up all idea of photography; far better that we should sell our apparatus for what it will fetch, and tell Mr. Brown that, having the welfare of the Society at heart, we will continue to pay our subscriptions, but that we are no longer to be counted as belonging to the elect. But, if the latter, then I say let us work away, and not be content until we know at least as much as any one else of that branch of photography which we have decided to take for our special study. The first thing needed is good technical knowledge. Let us therefore learn to know what is meant by correct exposure and correct development, and let us learn also to recognise these when we see them. A print, and consequently also a negative, which is but a means to obtain a print, should reproduce every gradation of the subject photographed, provided the gradations are within the range of the materials at our disposal; and, if they are not within that range, then our print should reproduce as many gradations as possible—that is to say, we should intentionally omit some of the gradations at either or both ends of the scale. We may sacrifice our high lights in order to obtain detail in the shadows, and *vice versa*, but all the gradations between the highest and lowest shown upon the print should be in their proper proportion to one another. Until we can produce such a print with almost certainty we have not a complete mastery over our apparatus.

To obtain this mastery we must also learn the possibilities of our lens, our plates, and our papers. The camera itself is merely a contrivance for holding the lens and plate. In its present form it is a very convenient contrivance, and when well made may be considered as without influence on the finished print. The quality of the lens is of the utmost importance, and it should, in my opinion, be the best that we can afford to buy. There is an infinite variety to choose from, but it is not for me to advise you which to obtain. We shall, however, doubtless find some form of rectilinear lens most useful at first, and can afterwards determine whether a portrait, landscape, or rectilinear, will best suit our requirements. My advice is, Go to a well-known English maker, who can be depended upon to sell you a lens as perfect as he advertises it to be; or, if you want to buy a second-hand one, get an expert to choose it, as only he can determine whether it be suitable and free from defect.

The question of plates comes next, and I say plates advisedly, because it is not to our advantage to commence with films, excellent as many of

these now are. Let our plates be slow in speed and rich in silver, in order that we may have the better chance of securing the correct scale of gradations, about which I spoke just now. Let us determine what maker's plates we are going to use, and keep to those plates. They are probably just as good as anybody else's; but don't let us buy a dozen of A's to-day and a dozen of Z's to-morrow, because each brand has its own little peculiarities, and we have not time to learn them all. We should determine also what developer suits our plates, and use no other. We must also learn a little of the chemistry of photography; get to understand how our plates are manufactured; what are the chemicals used in the manufacture; how these chemicals are affected by light, and by the developer after they have been exposed to light.

When we have mastered all these things, and are able to produce at will a print giving the result we desire, but not before, we may pat ourselves on the back and say, *Now* we are photographers.

Given a good negative, it is more or less easy to produce a good print from it. Care and a little judgment are required, nothing more. I would, however, strongly advise that we adopt one or other of the two really permanent processes now in vogue upon a commercial basis, namely, either platinotype or carbon. As a rule, beginners will not commence with these processes, being under the quite erroneous idea that they are costly, and, above all, difficult. I assure you that they are not difficult, I even doubt whether they are more expensive than silver or bromide, when the cost of chemicals is taken into consideration, and they certainly are more pleasing than either of the two last named, which in my opinion should be avoided as one would the plague. I don't mean to say that we should never make a print in silver or bromide, both are very useful for the purpose of obtaining proofs, but I do say that in all finished prints the image should rest upon an absolutely stable basis. Later on in the session, Mr. Brown will show you how easy it is to print in carbon, and I shall endeavour to do the same in platinotype. Personally, although I am accustomed to work the latter process, I incline to the opinion that the former is the more generally useful, owing to the greater range of tone which one has at command, as prints can thereby be made with almost equal facility in any colour one wishes. Again, with carbon or platinotype it is essential to have a good negative before one can get a good print, whereas with silver or bromide a passable print may sometimes be obtained from an inferior negative, and it is surely a distinct educational advantage to be obliged to produce a good negative for every print which one pastes in one's album to be handed round for the inspection of an admiring circle of lady friends.

And now, assuming that we have obtained a fair amount of technical skill, what particular branch of photography shall we take for our special study? There are many to choose from; shall we take up landscape work? This is the branch most usually selected by amateurs, and a very good one too, as it leads us out into the country and teaches us to study nature's ever-varying moods, besides giving us fresh air, at any rate, when our heads are not under the focussing cloth; moreover, it enables us to fill our albums with records of our holidays and journeys to countries beyond our own, where, owing to the novelty of our surroundings, buildings, costumes, manners, almost all things in fact, are pleasing in our eyes, if not to our noses. We can afterwards sit quietly by our firesides in the long winter evenings, and, with pipe in mouth and album on knee, enjoy our holidays over and over again.

Shall we take up *genre* work, and give pictorial representation to the scenes of every-day life? I can imagine nothing more fascinating, provided one has the necessary taste, time, and patience. Perhaps the greatest obstacle with the majority of us will be that it is almost indispensable to have the use of a studio, though it is wonderful how much may be done without one. Or shall we take up portraiture? We can become proficient in this with no more trouble than is required for landscape work or *genre*. Here, of course, some sort of a studio is a *sine qua non*. We must study lighting and pose, and, above all, the peculiar characteristics of our model, so as to be able to accentuate the important features, minimise the unimportant ones, and produce a likeness which is both artistic and natural.

Then, again, we may make photography an adjunct to other work; we may be writing a book, and wish to supply the illustrations. In such a case etching on copper plate or photogravure will be found most useful and suitable. We may be fond of working with the microscope, and wish, by means of photo-micrography, to represent the objects seen. We may be in a position to copy good pictures. Here an immense field is open to the earnest worker, and almost perfect representations of the various colour luminosities may be obtained by using the orthochromatic plates and mixed colour screens now on the market. I have heard a well-known Royal Academician state that "good photographs of pictures are superior to any mezzotints unless the etching is done by a man whose skill is equal to that of the artist who produced the picture. But pictures must be understood by the photographer, and intelligently copied, otherwise he might be at pains to render the detail of some unimportant object, and so lose the proper rendering of the subtle gradations in the colouring of some object forming the essential feature of the picture."

Photography may be made to play an important part in the study of almost any one of the many branches of physiography. Take, for instance, clouds. Here the various stratiforms and cumuliforms may be shown; also the forms indicative of various attitudes. What could



be more fascinating than the pictorial history of some mighty river from its source, say in the form of snow falling high up in some lofty range of mountains, thence passing gradually, first in the form of a glacier, then as a torrent, then as a broader stream, sometimes through lakes, sometimes past cities, until, at last, it is lost in the all-absorbing ocean.

Those who are fond of zoology will take delight in the representation of birds, beasts, and reptiles. The photography of flowers, too, will claim many votaries, and this is a branch which should especially appeal to ladies, who, as a rule, show more taste in their arrangement and display than does a mere man.

The subject may be enlarged upon enormously, but I fear that I must have wearied you long since with all this advice, so will only add that, if we wish to succeed, we must specialise, specialise; fix upon the branch of photography for which we have the greatest inclination and aptitude—the one will show you the other—and adhere to that branch until we have mastered it. To take a portrait to-day, a landscape to-morrow, and something else the day after, is not the way to find success.

Turning to other subjects, perhaps the most important matter which is now engaging the attention of photographers is the question of copyright. This is a question which probably does not appeal very forcibly to us as amateurs, but it should have our consideration and assistance as a society, as it is our duty to help by any means within our power to settle the question, once and for all, in a manner which would be satisfactory to the large and important body of men to whom photography is a means of livelihood. A Committee of the House of Lords is now sitting to consider the copyright laws in all their bearings, and it is to be hoped that they will be able to arrive at a decision agreeable to all concerned. As you are aware, a photograph has to be registered, after which it is copyright for the remainder of the author's life and seven years beyond. This is an uncertain period, and some have suggested that it should be altered to thirty years, irrespective of the life of the author; others wish that it should be made the same as for books, viz., forty-two years; whilst others, again, think that the same period should be given to photographs as artists are seeking to obtain for their own works, namely the author's life plus thirty years. Now, as a rule, a photograph quickly becomes of commercial value, if at all; whereas an artist's works are rarely in request for purposes of reproduction till after the author's death; and, this being so, it seems to me that, if a definite period of thirty years from the date of registration can be secured, it will be wise for photographers to accept such term as a satisfactory settlement of the question. But should it be necessary to register a photograph, or indeed any work of art, in order to obtain the protection of copyright? I think not. It is unnecessary to register in England a foreign work of art in order to obtain protection here; why, then, should it be necessary to register in England an English work of art? Surely it should be sufficient if every photograph bore on it a notice that it is copyright, together with the author's name and date of first publication.

Another matter which does not interest many of us, I fear, but which certainly should do so, is the National Photographic Record Association. This Association collects and tabulates photographs of all objects of interest throughout the United Kingdom, and particularly of such objects as have already disappeared, or are likely to be destroyed. The photographs are afterwards sent to the British Museum, there to be preserved as a lasting record of many things which would otherwise be forgotten. Those of you who have suitable photographs owe it as a duty to posterity to send such photographs to the Association. The only condition made is that prints must be in carbon or platinum, plain and unmounted, and not larger than whole-plate size.

There has been no very startling discovery or invention during the past year, nothing to revolutionise our existing methods of working, nothing to very much simplify the processes which we are accustomed to adopt; hypo is still indispensable, so that we yet have to waste much valuable time in washing our negatives for an hour or more in running water. Whosoever enables us to get rid of this troublesome necessity will deserve well of his country and the water companies.

Nevertheless much progress has been made in matters of minor importance. Following up the introduction of the Velox papers, we have had others, such as the Dekko and Gravura, which may be developed by ordinary gas or lamp light in a similar manner. This is a convenience, doubtless, to some, but is not a matter of paramount importance. The practical working of the Gravura paper will be demonstrated to you at our next meeting; and for it the makers claim that tones ranging through black and brown to red may be obtained by varying the length of exposure and the constituents of the developer. We have had new intensifiers and new reducers which are said to act well, and, doubtless, do so more or less, but whether or not they will do all that we have been informed they will has yet to be proved. A new form of carbon printing, called ozotype, has been invented, and examples shown by Mr. Manley; the tissue is not yet on the market, but it appears to be sensitised with bichromate of potassium and sulphite of manganese. The image is said to be visible during the process of development. No double transfer or reversed negative is required, and the bichromate is not present in quantities sufficient to injure the skin.

The Britannia Works Company has introduced a new platinum paper which they call Platona, and for which they deserve the best thanks

of all workers in this process. The Britannia Company will, no doubt, effect further improvements, and eventually give us a rough, as well as a smooth, surface to work on. Any how, a little healthy competition in the production of this particular form of paper cannot fail to be an advantage to the consumer, who has hitherto been practically in the hands of one firm only.

Of new developers there are, as usual, many; perhaps kaolin is the most important. I have not tried it, but am informed that it is very good, and more like pyro, which is still the photographer's mainstay for all-round work, than any other form of developer, with this advantage, that its keeping qualities are more durable, and that it does not stain the plates or fingers or injure the skin.

The introduction of papers which may be developed by gaslight has induced lantern-plate makers to do the same, and Edwards's kristal lantern plates are probably but the forerunners of many others of a similar character.

The popularity of the cinematograph has led to the introduction of the instrument in forms more or less adapted to the wants of amateurs, and in the biokam we have at our disposal a cinematographic view-taker, printer, projector, and snap-shot camera combined.

Then the new stripping film introduced by Messrs. Wellington & Ward should prove of great service to those of us who wish to make enlarged negatives, and do not care to go to the expense of using plates for the purpose.

Specimens that I have seen were all that one could desire. The film is mounted on paper in the usual way, and, after the negative has been developed, fixed, washed, and dried, the point of a knife is inserted between the film and the paper, the blade is run round all four edges, and the film stripped from the paper. It can then be laid upon a piece of glass, and printed through from either side at will, thus doing away with the necessity of making a reversed negative or using the double transfer process for carbon work. The film, when still attached to the paper support, can, of course, be pinned to an easel, or placed behind a sheet of glass, and an enlargement made as on ordinary bromide paper.

I cannot conclude this address without alluding to the ever-popular question of colour photography. We seek after it as the alchemists of old did the philosopher's stone or the elixir of life, and I am bound to say that I consider it to be nearly, if not quite, as illusory, at any rate to this generation; but who will dare to prophesy that a thing is impossible after realising the marvellous discoveries of the present century, and, if the progress made in the next is as great as has been the case in this, our children may yet live to reach the promised land, which to our eyes is still so very far off. And, if they do reach that land, will they be happier? Just think it out, and try to realise how things will be when the headquarters of the Royal Academy are transferred to Russell-square, and Burlington House has become a home for waifs and strays. Will a certain Council then be qualified to select the pictures to be shown at the greatest Art Exhibition of the year? Surely not.

No practical advance has yet been made towards the discovery of colour photography as the majority of us understand the expression—that is to say, in the production of an apparatus whereby we can take a negative direct from nature, and obtain, by printing direct from that negative on to paper or some other substance, a photograph which shall correctly reproduce all the varying colours of nature; but great improvements have been made in apparatus to enable us to see representations of things more or less in their natural colours, as in kromskop so cleverly contrived by Mr. Ives.

Quite recently a great advance has been made upon this invention of Mr. Ives's by Mr. E. Sanger Shepherd, who has devised a method whereby lantern slides, coloured solely by photographic means, may be thrown upon the screen from a single lantern and viewed by all, whereas formerly either a triple lantern was necessary, or else the picture could only be seen in a special instrument and by a single observer at a time.

Mr. Shepherd is one of our most clever workers in this branch of colour photography. I will therefore ask you to let me describe, in as few words as possible, the recent advances which he has made. You all know, of course, the principle of three-colour photography, that all the natural colours can be reproduced by the proper admixture of three different colours, a certain red, a certain green, and a certain blue-violet, and that white light, which is really the absence of colour, is obtained by a mixture of all these three colours in proper proportions.

Now, what Mr. Sanger Shepherd does is this: he takes negatives of his subject upon three different plates, one through a red filter, one through a green filter, and one through a blue-violet filter, the plates, of course, being properly orthochromatised. From these three negatives he makes positives in colourless gelatine, mounted on transparent celluloid, and each positive is afterwards stained, not in the colour of the filter through which the negative was taken, but in the colour complementary thereto, the reason for this being that we are now dealing with a positive of the negative taken through the screen, and not with the negative itself. The positives are then placed in exact register between two lantern glasses, and are ready for exhibition.

Gentlemen, I am very much indebted to Mr. Sanger Shepherd, who has been good enough to lend me some of his slides, prepared in the



manner just described, and these I will show to you so soon as the lantern is ready. They are most admirable slides, and I am sure that you will all, whether you have seen them before or not, join with me in thanking Mr. Shepherd for so kindly letting me bring them here to-night.

A. O. BEARD.

### A SILVER PHOSPHATE PRINTING PROCESS.

DR. JOHANNES MEYER, of New York, the patentee of this process, says it is based upon the discovery of the valuable properties of the silver phosphates when combined with organic acids, such as acetic, tartaric, citric, and succinic acids. The silver phosphates have so far not been employed for photographic or other purposes, and the only mention of any application made of them is to be found in Hardwich's *Manual of Photographic Chemistry*. He writes: "Other insoluble salts, such as the phosphate and citrate, render the paper more sensitive than when it has been treated with a soluble salt of silver only." The great value of the silver phosphates consists in their property of forming emulsions with suitable organic acids, which behave in all respects like the well-known emulsions of the silver haloid salts with albumen, gelatine, or collodion. Dr. Meyer proceeds: "I have discovered that the silver phosphates, aside from being soluble in ammonia, phosphoric acid, and nitric acid solutions, as was well known, form solutions with a number of organic acids, as, for instance, acetic, tartaric, citric, and succinic acid; but, under certain conditions, silver phosphates will form, in conjunction with an organic acid, a true emulsion."

I have studied the behaviour of silver phosphate towards tartaric acid in this direction most carefully, and, as the tartaric acid-silver phosphate emulsion is chiefly employed, I will now proceed to give directions how to prepare and how to use it.

To an aqueous solution of one drachm of silver nitrate a well-diluted solution of sodium phosphate is added. The resulting silver phosphate is well washed, by decantation, and brought to the volume of one fluid ounce. To this silver phosphate held in suspension we add five drachms of tartaric acid dissolved in five drachms of water, at the same time imparting to the containing vessel a quick rotary motion. In this way is obtained a white jelly-like mass of a volume of two ounces, containing a quantity of silver phosphate equivalent to the drachm of nitrate we started from. It is essential that all the chemicals, including the water, be chemically pure.

To render this emulsion more fluid, it is either slightly heated, or agitated with a glass rod, or by shaking the bottle. In this state it is used for coating the paper or other surfaces on which it is desired to print.

The proportions given above are the best for practical use. The preparation of the emulsion is, however, easier, for one not experienced in this special line of work, by mixing a fluid ounce of silver phosphate with a smaller quantity of tartaric acid; for instance, two drachms of acid in two drachms of water, when the emulsion will set more readily. When the emulsion is left in its jelly-like state, crystallisation will set in, after some time, while a portion of the silver is retained in the solution.

Citric acid seems to have the greatest affinity for silver phosphate. Twelve drachms of citric acid mixed with one fluid ounce of silver phosphate will produce a clear transparent solution which has remarkable sensitiveness and qualities.

The emulsion, or solution of silver phosphate in organic acid thus obtained is then applied in any suitable manner to the surface to be sensitised. It may be applied by means of a soft, flat camel's-hair brush to paper, after which it is permitted to dry. When this sensitised photographic paper is exposed under a negative to direct or shaded sunlight, a positive picture of great accuracy and agreeable tone is obtained. When the paper is first coated with albumen or gelatine, or any similar substance, a photographic print can be produced in less time than by the silver haloids heretofore employed, and not only sunlight, but also artificial light, can be used for producing a direct print. The photographic print thus obtained can be toned by any of the well-known toning solutions, and finally fixed by means of sodium hyposulphite. The print is then washed until no trace of the hyposulphite is left in the same. In place of paper, any other material, such as wood, celluloid, lithographic stone, silk, cotton, or other textile fabric, and other materials, can be coated with the photographic film, and pictures of great delicacy and beauty, not inferior to prints on paper, be produced thereon.

The advantages of my improved process of producing photographic films are that silver phosphates can be employed without the aid of a viscous substance like albumen or gelatine; that the silver phosphate emulsion, or solution, can be spread over almost any surface, like a paint or dye; and that only a very weak solution of sodium hyposulphite, and a short immersion of the prints, is required to remove the unchanged silver and render the prints permanent.

When the prints are left in the fixing bath for a longer time than a minute, the sulphuration of the prints will commence, which is induced by the organic acid, and which will be completed to blackness of the picture in a few minutes more. Though sulphur toning is believed to have many objectionable features, the prints made by the process described do not suffer in appearance if the sulphuration is not too long continued. The use of albumen will prevent the prints which have been toned by sulphur from becoming yellow and faded by atmospheric oxidation. These results were obtained by a number of tests, continued

through a considerable period of time. The dominant colour of the prints made by the silver phosphate emulsion or solution is a brown or auburn shade, which darkens considerably with the drying of the prints. Toning may therefore be dispensed with in many applications in the arts. When the prints are made on textile fabrics they are generally brown in tone, but this can be changed, in the case of cotton, to black, by passing a hot flat iron over the same, while prints on silk will not undergo this change. Though the predominating colour of the silver phosphate prints is brown, many of them show various other tones, and it must be assumed that certain negatives act as a media for the transferring of colour qualities and influence the production of the tone to a certain degree under conditions not yet known. When a silver bromide emulsion is added to a silver phosphate emulsion, the sensitiveness of the solution is so increased that even the light of a common petroleum lamp is sufficient to produce a direct print. The sensitiveness of the emulsion is also increased by the addition of a small quantity of citric acid. The solution of silver phosphate in citric acid, when applied to a plain piece of paper and exposed under the negative to direct sunlight, produces a print of very agreeable bluish tone, which will compare favourably with other prints in accuracy, in the high lights, and in the depths of the shadows.

Paper coated with albumen and sensitised with a silver phosphate emulsion or solution has great durability, and will not deteriorate under climatic influences. It can be used therefore at any time for printing, without impairing the quality of the print. . . . The print is removed from the printing frame directly to the fixing bath, to which sodium bicarbonate is added when the original colour of the print is to be preserved. The print remains in the fixing bath for a short time, and is then freed from any adhering traces of sodium hyposulphite by washing it in hot or cold water for about five minutes.

### GREAT TELESCOPES OF THE PRESENT DAY.

In his Presidential address to the British Astronomical Association, Mr. W. H. Maw remarked that the great telescopes of the present day are of a very different class to the giant instruments of the past. The great reflectors of Herschel, of Lassell, and of Rosse were all instruments made and used by amateur astronomers, and, although they possessed great light-grasp and did some admirable work, they were, owing largely to the nature of their mountings, utterly unfitted for the class of observations on which the large telescopes of the present day are chiefly employed. The thirty-six inch and sixty-inch reflectors of Dr. Common may, perhaps, be regarded as the latest of this older class of large telescopes, although it would probably be more just to consider Dr. Common's instruments as forming a connecting link between the giants of the past and present. In the case of such large refractors as those at Pulkowa, at Washington, at Vienna, at Mount Hamilton, at Nice, at the Yerkes Observatory, and at Greenwich, the cost of the telescope itself is but a small portion of the total outlay incurred. Not only must such an instrument be thoroughly well mounted to fit it for modern research work, but it must be protected by a well-constructed dome, and, in order that every moment of good seeing may be utilised, provision should be made for effecting all movements of both telescope and dome with the least possible amount of labour to the observer using the instrument. How perfectly this can be done is well shown by the great Yerkes refractor, which, notwithstanding its enormous size and weight, can, with its dome, be so readily handled by the electric motors with which it is provided, that it can be, and is, efficiently used by a single observer through a whole night without any assistance whatever. It is satisfactory to know that two of our own members, Messrs. Warner and Swasey, were responsible for both the design and construction of this admirably perfect mounting, while the rising floor, which forms such an important feature in the equipment of both the Yerkes and Lick Observatories, and contributes so much to the convenient use of these large telescopes, was the invention of another of our members, Sir Howard Grubb. But, by the time a refractor of this kind has been erected and equipped, the outlay upon it will have become so large that it would be utter folly to use the instrument for work other than that for which its great power renders it specially fitted. The result of this is that our modern giant telescopes are, with few exceptions, employed not in doing work which was formerly done by smaller instruments, but in doing work which formerly could not be done at all. Such, for instance, is the bulk of stellar spectroscopic work, including determinations of velocity in the line of sight, the measurement of close double stars, the spectroscopic examination of nebulae, the discovery of new planetary satellites, and similar matters. We see, therefore, that the establishment of these powerful telescopes has been accompanied by the development of new fields of research, and that the work which was formerly done, and can still be well done, by instruments of moderate size, has not been reduced. On the other hand, many professional astronomers have withdrawn from the work which they formerly did with the instruments then available, and they have thus left to amateur observers the continuance of their former labours. We thus see that there is ample work for the members forming our observing sections, and that such work, if faithfully carried out and recorded with judgment and discrimination, is calculated to be of great and permanent value.



## STEREOSCOPIC PHOTOGRAPHY FORTY YEARS AGO.

SENEX writes: "I have just been looking through a book, published in 1857, written by J. M. Jephson, entitled *A Walking Tour in Brittany*. The book appears to have been issued with an accompanying portfolio of stereoscopic pictures, referred to in the enclosed extract. A silver print from one of the negatives, mounted so as to be seen stereoscopically by placing a stereoscope over the page, appears as a frontispiece. The photographer who was engaged by the author to travel over the same ground and make the necessary illustrations is a Mr. Lovell Reeve, who writes an interesting note, printed in the work, of his outfit and manner of working, which I extract. It brings back vividly to those of us who were wrestling with the art in those far-off days the labour that was involved in making photographs. I wonder whether Mr. Lovell Reeve is yet alive, and also whether any of your readers have preserved a set of the stereoscopic pictures then produced."

Extract from Jephson's *Walking Tour in Brittany*, published 1857:—

"Our apparatus consisted of a small double-lens landscape camera by Ross, a black tent about four feet square and seven feet high, fitted with a table and sink, the whole folding up into a moderate-sized portmanteau, and two boxes of chemicals, one for use and the other for store, with a third box containing in a small compass a gross of glasses, comprised in six inner boxes of two dozen each. It was decided to confine our operations to the wet-collodion process, and to defer varnishing the plates until our return home. Great care was necessary so to economise our hours of travelling as to have the fairest weather and the best description of light at our disposal while at work with the camera."

"The first thing to be observed on entering a town or village was the position the sun would be in, with respect to the objects selected, at the time we should be prepared to photograph them, the points of view to be taken, and the most effective arrangement of the foreground. The next consideration was to select a place for our tent in the nearest proximity to two or more views together. The result was that we visited thirty towns and villages within the space of thirty days, pitching our tent about a hundred times, during which my active photographer, Mr. Taylor, could not have taken less than two hundred pictures, from which the present ninety have been selected for publication. Our evenings were fully occupied in looking over the day's harvest, clearing away the day's disorder, and preparing plates and chemicals for the next day's work."

## X RAYS ON THE BATTLEFIELD.

THERE can hardly be in the world of surgery a fitter sphere than the battlefield for the operation of X rays. The humane are, doubtless, consoling themselves with the thought that, while military science is doing its utmost in the way of human mutilation, surgical science is efficiently, and to the minimum of pain and inconvenience, effecting repairs. Experience unhappily hardly justifies this assumption. The surgeons are skilful and courageous enough; but they are often badly equipped in respect to ambulance appliances (says the *Birmingham Daily Argus*), and the most important of our late wars in the Soudan and elsewhere have been followed by grave expressions of dissatisfaction in Parliament on the treatment of the wounded. The replies of the War Office to critical queries undoubtedly showed that the ambulance arrangements were faulty. One such expression only need be quoted. After the battle of Atbara, the Under-Secretary of State for War stated that "there had been no case of a wounded man at the Atbara to whom the absence of the Röntgen apparatus had made any difference." The important circumstance to be noted is that the Röntgen apparatus was absent. The fact that important institutions like our own General Hospital have established a permanent radiographic department in connexion with the hospital tells its own story, and will enable the average reader to place the true value on the official reply above quoted. With the view of obtaining an expert expression of opinion on the subject, our representative waited upon Mr. Hall-Edwards, the surgical radiographer to the General Hospital, Birmingham, and found that the expert had himself been taking a special interest in this matter. He declared most emphatically that until Saturday last he had seen no notice of an X-ray expert having left this country for the seat of war. Since then several have departed, but the number is still very inadequate, and the War Department do not seem to realise the great value of the Röntgen discovery in the treatment of the wounded. Said the expert: "The proper and complete application of the X rays to military surgery must prove one of the greatest, if not the greatest, advance of the century. Yet it is a remarkable fact that in the Nile Expedition there was no apparatus, the excuse of the Department being alleged serious transport difficulties. When these were got over, said the War Office, the apparatus would form a part of the field equipment. The same statement was made two years before, and apparently no steps had been taken in the meantime to overcome the difficulty." Mr. Hall-Edwards, we may remind our readers, has devised a coil which he has himself repeatedly used in field practice on the occasion of Volunteer Ambulance demonstrations, and he is satisfied that the transport difficulties about which so much is made are imaginary. The apparatus worked perfectly, and the iron-bound case weighing thirty pounds was readily carried by a couple of men. Other requisites are a portable developing tent with stand, and a box of tubes,

photographic film, and chemicals. Although taken in an ambulance wagon, and jolted over several fields, the apparatus suffered in no way from the shaking, and worked to perfection. At the base hospital a somewhat larger apparatus, but otherwise in no way different, would amply meet all surgical requirements, and would be invaluable in the location of bullets.

Arrangements could also be made for the recharging of accumulators. Far too much, Mr. Hall-Edwards thinks, has been made of the difficulties in the recharging of accumulators; but, on the occasion above referred to, a small dynamo driven by a couple of men on a tandem bicycle admirably served the purpose, and other contrivances might be devised. Such renewals, however, would be seldom necessary, as a store of electricity carried in three such accumulators would, if used several times every day, last for some weeks. As a matter of fact, the difficulty in the application of the rays can easily be overcome.

The impossibility of securing absolute cleanliness in the treatment of wounds on the battle-fields renders any help obtainable in this direction of the greatest importance. A most important circumstance is that the rays can be applied painlessly, and without the necessity of removing dressings and splints.

An injured limb can be examined and a diagnosis made, the presence, shape, and position of a bullet or a portion of a shell can be ascertained, and the exact line, the amount of comminution, and displacement of a fracture be discovered without giving the patient the slightest pain or even discomfort, and all this without, in many instances, removing the dressings. The greatest dangers in military surgery arise from the undue exposure of the wounds to a bacteria-laden atmosphere, and to prolonged, dangerous, and (now) unnecessary manipulation. Prior to the discovery of the rays, the only method of discovering or locating bullets was by the use of a probe—a piece of blunt-pointed silver wire—which was pushed into the wound in all directions until the presence of a piece of metal was discovered. Every time the probe was introduced it carried with it a number of germs, and thus the wound was rendered exceedingly liable to infection. As a death-dealing instrument a dirty and unskilfully used probe has few equals, whilst, even in the hands of the experienced surgeon, its inherent propensity for travelling in the wrong direction has rendered diagnosis by its means a difficult and dangerous operation. To quote a recent example of surgical difficulties, Colonel Whitehead's report on the Tirah campaign related how near the heights of Dargai the box of surgical dressings was covered with dust, and the only water available was the village pond, extremely putrid through the large accumulation of sewage. The dressings were applied by a man whose hands were dirty, and there was no sterilised water carried in the equipment. The X rays, under those circumstances, would have been simply invaluable. By their means the bullet can be exactly localised, painlessly and antiseptically, and the certain diagnosis enables the surgeon to at once, and with confidence, decide as to whether its removal is necessary or not. A suggestion has been made that Birmingham should send out an ambulance corps, and the inclusion therein of a complete X-rays equipment would be a priceless boon to the brave fellows who have the misfortune to be injured on the field.

## CRYSTOLEUM.

At a meeting of the Leeds Camera Club on Wednesday, November 1, Mr. J. Skilbeck gave a lecture and demonstration, entitled "More about Crystoleum."

Mr. Skilbeck, in his remarks, pointed out that, as this lecture was practically a continuation of the one he gave last session, he would, for the benefit of any who might not have been present at that time, recapitulate the points then dwelt upon. Having dealt with the print, the selection of the glasses, and the process of clearing it by what was termed the "medium" method, he went very fully into an alternative process, known as the wax method. This process is to place the glass with its print, when properly squeezed on, into a bath of paraffin wax, and allow it to remain some two or three hours, or until the wax had thoroughly entered the pores of the paper. On taking it out, the chief obstacle to the wax method became manifest, by grey spots appearing on the face of the print in very large quantities. To this he had given a great amount of attention, and he explained to the members and visitors present the cause and its remedy. He advocated the wax method, when done properly, as being better than that of the medium, as giving finer and softer results, whilst for the thinning down of the paint in the after-process of colouring only poppy oil need be used; but he strongly cautioned them against using this oil if their prints had been cleared by the first-named "medium" method, as, with it, a preservative sold along with the medium must only be used. He said that, in washing out their brushes with turpentine, care must also be taken never by any possibility to allow any to come in contact with the surface of their work or in the paint used, for, if they did so, disappointment would surely result. In conclusion, the lecturer pointed out the advantages and beauty of the work. It enables any one having a taste for colour to produce most pleasing results, besides being a most interesting occupation, and, if they would carefully attend to those little details which he had enumerated, they would succeed.



## THE PRINCIPLES OF DEVELOPMENT.

On October 30 Mr. Watkins, at the Camera Club, gave a lecture upon the principles of photographic development, in which he endeavoured to combat some popular beliefs, which he proved had no foundation in fact. His remarks were illustrated by a number of slides, which consisted mostly of strips of developed plates, which were brought into contrast in order to show both the effect of time of exposure and nature of developer, and it was evident that these strips were the result of laborious and painstaking experiments. As he mentioned that the paper will shortly be published in *extenso*, we shall at present confine ourselves to a very general review of the ground which it covered.

Mr. Watkins commenced his discourse by pointing out that there was, for every plate, a minimum exposure below which there is no developable impression made upon its sensitive coating, while at the other end of the scale was a maximum beyond which no effort could induce further effect. It was a common belief that over-exposure led to thinness of result, but this was a mistake, for full development would ensure enough density to meet all needs. Another common belief was that metol had the power of bringing out the upper tones of the negative more quickly than any other developer. His experiments showed that all developers act in much the same ratio. Longer development, as a general rule, gives greater contrasts, but there are exceptions in particular plates, in which the rule is not followed. Each make of plate on the market has its limitations. A few years ago he took the trouble to examine with great care the directions for development issued by the different plate-makers, and he found, to his astonishment, that most of them altogether ignored the question of time of development, and not one of them pointed out that length of development led to increased contrast.

The lecturer next dealt with the subject of fog, and said that it was full of difficulty, and had not yet been thoroughly investigated. Even Messrs. Hurter & Driffield, with all their splendid labours in the cause of photography, had not got to the bottom of the question, and he could not pretend that he himself had been more successful. He had found that, using hydroquinone as a developer, fog presented itself in five minutes, and that when once it starts it continues to grow apace.

Next he dealt with the variations of different developers under three heads, namely, energy, multiplying factor, and speed, giving various tables to show the action in these respects of pyro, metol, ortol, adurol, kachin, quinol, glycin, and metol-quinol mixed. The most lazy density producing developer was rodinal, which may, under certain circumstances, take more than an hour to produce its full effect. All developers give the same amount of density provided sufficient time be given with each to produce its full effect. We must remember that it is the action of light which confers density upon a plate, not the agent by which the image is revealed. It is true that certain plates work better with certain developers, and some work much better if bromide be absent. This remark applies to Cadett's "Spectrum" plate, to Lumière's and others. At an early stage bromide lessens speed of development, and it induces a steeper gradation, but as the action is carried further, the addition of bromide is found to make no difference in the result. Bromide is useful under certain conditions, but he himself prefers not to use it. The time of appearance of the image is, in his opinion, the only guide to correct period of development.

Mr. Watkins concluded an admirable lecture by showing some beautiful pictures on the screen including several snapshots. The negatives of these he had never looked at during development, simply removing them from the dish when the period, calculated from the first appearance of the image, had elapsed. Many of the pictures had been exposed behind a Cadett screen.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, November 15, at eight o'clock "Lantern Luminosities," by Mr. R. R. Beard.

LECTURE ON ARCHITECTURAL PHOTOGRAPHY.—Mr. H. W. Bennett, F.R.P.S., will deliver a lecture on this subject before the Borough Polytechnic Photographic Society on Wednesday next, the 15th instant, at 8.30 p.m. Tickets of admission can be obtained of the Hon. Secretary, 103, Borough-road, S.E.

THE Process and Engineering Company, of 60, Gravel-lane, Southwark, S.E., inform us that they have purchased the business of the late Surrey Manufacturing Company, at 60, Gravel-lane, together with all rights, patents, and registered designs in the manufacture of dark rooms, studios, sinks, process cameras, and process-workers' machines, &c.

TRAILL TAYLOR MEMORIAL LECTURE.—The second lecture in memory of the late J. Traill Taylor will be delivered at the rooms of the Royal Photographic Society, 66, Russell-square, W.C., on Tuesday evening next, November 14, 1899, at eight p.m., by Major-General Waterhouse, I.S.C. The subject is "The Teachings of the Daguerreotype." Mr. A. Haddon will take the chair and admission will be free.

MESSRS. FURST BROTHERS, 17, Philpot-lane, E.C., inform us that they have added the following cinematograph subjects to their stock of pictures: 1st Battalion Rifle Brigade embarking on a.s. German; H.R.H. the Duke of Connaught and party (Sir Russell Baker and officers of the general staff) coming aboard to bid farewell; soldiers waving "Good-bye" as ship leaves; Union liner German departing (close view, showing soldiers).

## Patent News.

THE following applications for Patents were made between October 23 and October 28, 1899:—

CAMERAS.—No. 21,096. "Improvements in Magazine Photographic Cameras." F. H. ALSTON and THE BIRMINGHAM PHOTOGRAPHIC COMPANY (Limited).

LAMPS.—No. 21,097. "Improvements in Lamps for Photographic Purposes." F. H. ALSTON and THE BIRMINGHAM PHOTOGRAPHIC COMPANY (Limited).

HAND CAMERAS.—No. 21,098. "Improvements in Hand and other Magazine Photographic Cameras." F. H. ALSTON and THE BIRMINGHAM PHOTOGRAPHIC COMPANY (Limited).

ANIMATED PHOTOGRAPHY.—No. 21,127. "An Improved Method of Taking and Reproducing Animated Photographic Effects." H. DICKINSON.

DARK SLIDES.—No. 21,206. "Improvements in and connected with Photographic Cameras, Dark Slides, Film-carriers, Focussing Screens, and Adapters." H. MAJOR.

FILMS.—No. 21,241. "Improvements in Photographic Films and Cartridges." Communicated by A. W. McCurdy. Complete specification. W. P. THOMPSON.

CAMERAS.—No. 21,242. "Improvements in Photographic Cameras." Communicated by A. W. McCurdy. Complete specification. W. P. THOMPSON.

DEVELOPING, &c.—No. 21,243. "Improved Process of and Apparatus for Developing and Fixing Photographic Films." Communicated by A. W. McCurdy. Complete specification. W. P. THOMPSON.

SHUTTERS.—No. 21,246. "Improvements in Shutters for Photographic Cameras." P. WALLIS and E. F. WALLIS.

APPARATUS.—No. 21,251. "Improvements in and connected with Photographic Apparatus." P. BONNAMY.

X-RAY APPARATUS.—No. 21,267. "Apparatus for Enabling the Positions of Foreign Bodies Visible by the X Rays to be Located, and for Guiding the Operator in Searching for and Extracting the same." C. REMY.

APPARATUS.—No. 21,310. "Improvements in or relating to Apparatus for Taking and Exposing Photographic Pictures." Communicated by P. A. J. Gasse. A. J. BOULT.

REVERSED NEGATIVES.—No. 21,405. "A Means of Making a Reversed Negative by Direct Contact with a Negative." D. K. WHITOME.

APPARATUS.—No. 21,431. "Improvements in Photographic Apparatus." J. P. LEA.

PHOTOGRAPHS ON METALLIC SURFACES.—No. 21,414. "Improvements in and relating to the Reproduction of Photographic Pictures on Metallic Plates or Surfaces." G. S. BETTISON.

CAMERAS.—No. 21,510. "Improvements in Photographic Cameras and Changing Bags." M. NIELL.

CHANGING BOX (?)—No. 21,515. "A New or Improved Box for the Treatment of Photographic Plates, Films, and the like." R. E. FRASER.

REPRODUCTION OF PHOTOGRAPHS.—No. 21,597. "Improvements in and relating to the Reproduction of Photographs." O. FULTON and M. GILLARD.

ARTIFICIAL LIGHT.—No. 21,598. "Improved Means for Facilitating the Taking of Photographs by Artificial Light." Complete specification. C. BERNHOEFT.

## Meetings of Societies.

## MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
13.....	Bradford Photo. Society .....	A Night among the Flowers. W. H. Atkinson.
13 .....	Kingston-on-Thames .....	Demonstration: Gravura Paper. A. C. Baldwin.
13.....	Oxford Camera Club .....	Practical Hints on Mounting. H. Minn. —Some Points on Development. C. Rippon.
14.....	Ashton-under-Lyne.....	Mountaineering within the Arctic Circle. Mrs. Main.
14.....	Birmingham Photo. Society ..	Under the Sunny Skies of Greece. R. L. Impey, J.P.
14.....	Leeds Photo. Society .....	Lantern-slide Making. Godfrey Bingley.
14.....	Royal Photographic Society ..	Teachings of the Daguerreotype. Major-General J. Waterhouse, I.S.C.
15.....	Oroydon Camera Club .....	A New Method of Artificial Lighting for Portraits. W. H. Smith.
15.....	Hackney .....	Opening of Annual Exhibition.
15.....	Photographic Club .....	Lantern Luminosities. R. R. Beard.
15.....	Southsea .....	Exhibition of Animated Photographs with the Birtac and Biokam. L. Dyer.
15.....	West Surrey .....	Sensitising Paper. J. Bulbeck.
16.....	Darwen .....	Great Eastern Railway Slides: A Trip on a Norfolk River.
16.....	Leigh .....	Various Reducers. W. Hampson.
16.....	Liverpool Amateur.....	Mountaineering within the Arctic Circle. Mrs. E. Main.
16.....	London and Provincial .....	An Easy Method of Stripping Negative Films from Glass. F. Kellow.
17.....	Ashton-under-Lyne.....	Elementary Photography Class.
17.....	Croydon Microscopical .....	A Holiday Ramble in Italy. Philip Crowley.



## ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 7.—Lantern Evening.—Mr. Snowden Ward in the chair.

The inauguration by the Council of a series of lantern evenings received ample justification on Tuesday evening, when a large audience, which included many ladies, assembled to hear a lecture by Mr. J. J. Vezey (the Chairman of the Lantern Committee), with lantern slides from photographs by Commander C. E. Gladstone, R.N. The lecture itself was chiefly a description of the slides, but the latter were not only of great interest in themselves, as depicting quaint and beautiful features of old-world cities, but also displayed a high degree of technical excellence, and were received with appreciation and frequent applause.

Mr. VEZEY, before commencing his lecture, alluded to the formation a few years ago of the Lantern Society, in which he had taken a prominent part, but whose existence was not very prolonged. Since its demise, however, there had been a desire in many quarters that the exposition of lantern work should receive attention at the hands of some existing institution, and he had accordingly brought the subject before the Council of the Royal Photographic Society, who had readily agreed to the proposition that a meeting on the first Tuesday in each month should be devoted to this purpose. If the members of the Society and their friends supported the movement by their attendance and appreciation, no effort would be spared by the Committee to provide interesting and attractive subjects, and it was hoped that this new departure would tend to increase the already considerable inflow of new members to the Society, who would find a convenient and suitable scientific home at the new premises in Russell-square.

The subject of Mr. Vezey's lecture was

## SOME MEDIEVAL TOWNS OF GERMANY.

the places dealt with including Rothenburg, Nuremberg, Bamberg, Ratisbon, and Ulm. Rothenburg, described as a charming medieval town, with walls and towers, its houses being principally red-tiled and gabled, with Gothic churches and Renaissance secular buildings, was illustrated by views of its quaint *thors*, or gates, the Rathaus, the Hegerester's Haus (house of the gamekeeper), the Baumeister's, or architect's, house, the fountain of St. George and the Dragon, the church of St. James, with an altar of beautifully carved limewood dating from 1478, typical street scenes, and others. Nuremberg, one of the most remarkable and interesting cities of Germany, and full of remains of medieval architecture and quaint streets, afforded many fine subjects for the photographer, including the old palace or castle, founded in 1024, enlarged in 1158, and restored in the Gothic style, and fitted up as a royal residence in 1854-6, the churches of St. Lorenz and St. Sebald, the Rathaus, Peller's Haus and Court, views in the streets and squares and on the river, and the house of Albert Durer, who was born at Nuremberg in 1471. Several fine interior views of Bamberg Cathedral were shown, with many other interesting buildings in this ancient city, which enjoyed municipal privileges as early as 973, and all the choice bits of Ratisbon and Ulm were admirably reproduced, and described in a style calculated to make every archaeologist long to spend a holiday in rambling among scenes so crowded with historical and artistic interest.

A hearty vote of thanks was given to Mr. Vezey and Commander Gladstone for the excellent entertainment they had afforded.

## COMING EVENTS.

The next Ordinary Meeting of the Society will be held, at 66, Russell-square, on Tuesday next at eight o'clock, and at 8.30 Major-General Waterhouse, I.S.C., will deliver the second Traill Taylor Memorial Lecture, the subject being "Teachings of the Daguerreotype." At the next Lantern Evening (December 5, at Russell-square), Mr. Frederick H. Evans will lecture on "Lincoln Cathedral," and exhibit slides from his own negatives.

## LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 2.—Mr. P. R. Salmon in the chair.

Mr. R. P. DRAGE said that he observed that his remarks at a previous meeting regarding combined toning and fixing baths had been the subject of adverse criticism in this JOURNAL. We were informed that Hardwich had investigated the matter some forty years ago, but he thought that, in the light of present-day discoveries and advances, these should by now have been supplemented. He still thought there was much to be done by chemists in putting upon a definite foundation the use of combined toning and fixing baths, and laying down the essentials for permanent results. He also desired to see the preliminary washing of P.O.P. done away. It was not merely a question of saving oneself trouble. We had processes like bromide printing, platinotype, &c., where the prints are taken from the frame and put straight into the developer or other bath, and why not an analogous treatment for P.O.P.?

Mr. S. H. FRY agreed so far with Mr. Drage's desire to simplify toning and fixing processes as to say that it was the tendency and desire to improve upon photographic methods, which had made photography what it was at the present time.

The CHAIRMAN said he had tried, he believed, all combined toning and fixing baths, but had gone back to the use of the separate solutions.

Mr. Walter D. Welford showed a series of slides of Belgium, its chief cities and historical features. The pictures were taken during a visit made under the auspices of the South London Photographic Society, and under the leadership of Messrs. Welford and Slater, in the summer of the present year. The places visited included Antwerp, Malines, Brussels, Waterloo, Namur, Dinant, Ghent, &c., and the photographs, taken as they were by some twenty or thirty different people, with their different styles, showed a pleasing variety of subjects. There were some very good interiors of cathedrals and churches, snapshots of street scenes, figure studies and landscapes, and, on the whole, the display was of good quality and attractive.

## PHOTOGRAPHIC CLUB.

NOVEMBER 1.—Mr. Frank Haes in the chair.

## ANNUAL MEETING.

The minutes of the last Annual Meeting were read and confirmed.

Mr. H. P. Radcliffe and Mr. J. W. Wade were unanimously elected members of the Club.

The HON. SECRETARY read the Committee's report and balance-sheet for the past year.

The CHAIRMAN remarked that the members could be well pleased with the state of the Club, both financially and otherwise, and moved the adoption of the report and balance-sheet.

Mr. BRIDGE seconded the motion, which was put to the meeting and declared carried unanimously.

Mr. FOXLEW proposed the hearty thanks of the meeting to the officers of the Club for their labours during the past year.

Mr. HASTINGS seconded the motion.

Mr. BRIDGE supported the same, adding that, the special thanks of the Club being due to the Hon. Secretary, he wished to couple the proposed vote of thanks with the name of Mr. Stretton.

The motion was carried unanimously, and

Mr. STRETTON returned thanks.

## ELECTION OF OFFICERS.

Messrs. R. Child Bayley and E. W. Parfitt were appointed scrutineers, and the gentlemen named were declared duly elected:—*Trustees*: Messrs. F. A. Bridge and Frank Haes.—*Committee*: Messrs. E. W. Foxlee, H. Vivian Hyde, A. Mackie, Hans Müller, E. A. Newell, Hutton P. Smith, H. Snowden Ward, and Walter D. Welford.—*Curator and Librarian*: Mr. Chas. Wallis.—*Secretary and Treasurer*: Mr. W. R. Stretton.

**Croydon Camera Club.**—The weekly meetings, which have been somewhat interrupted by the Exhibition, were resumed on Wednesday, the 1st inst., with all their usual power of attraction, a very satisfactory attendance ensuing to hear Mr. HARRY WADE descend upon

## STRIPPING FILMS.

That the lecture was worth attention is, in a way, evidenced by the fact that the lecturer travelled all the way from Manchester to Croydon on purpose to deliver it, returning after it was over to the metropolis of cotton land. In the first place, a number of large and attractive prints, which stood all the tests of specialist criticism as regards technicality, were handed round just to show what the film is capable of. Next Mr. Wade dwelt upon the manifold advantages of this acceptable addition to the materials at the disposal of the amateur. To put them shortly, the new film is in every respect as reliable and easy to control as the glass plate. Unlike celluloid films, the stripping film has great keeping power and latitude, and is not liable to pinhole defects, nor insensitive patches, nor "electric" fog. As an indication of their portability, eight dozen quarter-plates may be posted for one penny. Impatient amateurs will be glad to know that they can, at one time and in one dish, develop a dozen or more negatives, one on top of another. Moreover, if the picture is not all that it should be, instead of stripping the film from its paper support, nothing is easier than to sketch upon the paper backing lights which the negative lacks, and thus produce a picture which, *perhaps*, beggars nature.

**North Middlesex Photographic Society.**—October 30, Technical Night, Mr. T. E. Cox in the chair.—Mr. J. MACINTOSH said a good way of making a full-size copy of an engraving, if a reversed copy was immaterial, was to expose through the print in contact with a sheet of bromide paper, giving about two and a half times the normal exposure required, and developing up until the image was nearly buried, and reduce the developed image with persulphate of ammonia, subsequently redeveloping in daylight, when a reversed positive print resulted. He found the fine lines reproduced much better by this method than by means of dry plates, although not equal to wet plates. He also mentioned the method of Mr. J. Holt Player of exposing bromide or Alpha paper to green or yellow light in contact with engraving, &c., the light falling on the back of sensitive paper, which was placed in close contact upon the engravings. Examples were to be seen at the Pall Mall Exhibition. Mr. F. W. Cox showed prints on Venus paper, Velox, and by Moss's process; half of each had been exposed for months to light and damp in a window, which was undoubtedly a severe test, as some of the prints showed signs of water having been upon them. They all showed more or less signs of fading except Velox, which might be expected to stand a severer test, being a development paper. Mr. Lawson, jun., showed a negative taken after a hailstorm, with some black wood railings in the foreground. A curious effect was noticed, in that the upright bars distinctly showed through the horizontal rail along the top. Mr. MUMFERY suggested it might be caused by a condensation of moisture upon them, greater where the rail was not in contact with the uprights, the greater thickness of which made a better non-conductor of heat. Several other curious experiences were related, and, after the prints of the "Foreground Foliage" Competition had been viewed, the meeting terminated.

**Leeds Camera Club.**—October 31, Special Meeting, the President (Mr. W. J. Warren) in the chair.—The object of the meeting was to settle the question of providing exclusive premises for the Club, which were to comprise lecture-room, reading and smoking-room, with a dark room, properly equipped with enlarging apparatus and conveniences for better photographic work. The rooms were to be open on other than the ordinary meeting nights. To enable the rooms to be properly fitted and comfortably furnished, a limited company was to be formed, with shares of 10s. each, of which 4s. per share was considered sufficient to successfully float the scheme, on an issue of 400. The Committee of Management and their friends were prepared to find the money, but it was deemed inadvisable for them to do so entirely, for, in order that the members should have some interest in the scheme, they were expected to contribute at least one-third. The subscription was to be raised to 10s. per



annum, and, as this was about 2½d. per week, with the advantages offered, it was thought little enough. It was thought also that a sufficient number would be ready to take up the matter, and, together with a large increase of membership as the result of the movement, it was thought the required outlay would be fully met. A circular was sent to each member, asking for his opinion on the matter, but nearly ninety of the members sent no reply. Of the replies received, seventy-five per cent. were in favour of the rooms and the increased subscription, but only a very small number of shares were taken up. As the effect was to throw the whole cost on the Committee, who themselves might next year be out of office, the officers could not proceed with the scheme. The apathy and indifference of the members was further manifested at the general meeting, when only twelve per cent. of the members, other than the Committee, were present. For some time the aim and work of the management have been to elevate the standard of the Club, both in itself and in its work. A syllabus second to none in the kingdom was brought out, and a great amount of unseen work and energy put into the Club, but it would now appear that what has been done has not the sympathy of a large proportion of the members, and this has manifested itself in many ways during the past few months, whilst the absolute failure of the scheme is felt to be a censure on the management. The President, two Vice-Presidents, Treasurer, Secretary, and certain members of the Committee have therefore resigned their positions; but, in order not to impede the work of the Club, or injure it in any degree, such resignations need not, if the members wish, take effect till the close of the Club's financial year ending December 31 next, leaving the new management four months' working programme arranged for.

**Edinburgh Photographic Society.**—November 1, Mr. A. Eddington, F.S.I. (President), in the chair.—Mr. J. LAWTON WINGATE, R.S.A., read a paper on PHOTOGRAPHY IN RELATION TO ART.

At the outset he dealt with the limitations of photography, while admitting its great power to reach millions and give information to millions on all sorts of subjects who would otherwise be uninformed. The lecture was listened to with much interest by a crowded audience. Messrs. PATRICK, HAY, and WANACK afterwards dealt with the salient features of the paper, and in doing so referred to the excellence of Mr. Wingate's work as a painter. Dr. H. SCOTT LAUDER, R.N., afterwards gave a demonstration of persulphate of ammonia as a new reducer. By skilful illustrations on the blackboard, and by specimens which were handed round the audience, Dr. Lauder showed it to be a most powerful agent for improving and correcting under-exposed and over-developed negatives. Messrs. BURNS, J. B. JOHNSTON, and the PRESIDENT took part in an interesting discussion which followed. Thirty new members were elected in the course of the evening.

#### FORTHCOMING EXHIBITIONS.

1899.		
November 10, 11.....	Royal Photographic Society. Hon. Secretary, Major-General Waterhouse, 66, Russell-square, W.C.	
" 10-19 .....	Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.	
" 15-17 .....	Hackney Photographic Society. W. Selfe, 70, Paragon-road, Hackney, N.E.	
" 20-25 .....	Longton and District Photographic Society. Thomas Mottershead, 43, Stafford-street, Longton, Staffordshire.	
" 27-Dec. 18	American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.	
December 7-9 .....	Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.	
" 11-Jan.1900	Huddersfield (Invitation). W. A. Beevers, Cloth Hall-street, Huddersfield.	
" 27-30 .....	Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.	
1900.		
January 29-31.....	Southsea Amateur Photographic Society. F. J. Mortimer, 10, Ordnance-row, Portsea.	
April 3-7 .....	Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.	

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

### Correspondence.

\*.\* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\*.\* We do not undertake responsibility for the opinions expressed by our correspondents.

#### LOAN SET OF BELGIAN SLIDES.

To the Editors.

GENTLEMEN,—On behalf of myself and Mr. William F. Slater as leaders of the Belgian Excursion, will you kindly announce that, in response to

several inquiries, the set of slides shown at the Royal Society on Saturday night last will be loaned out to any society desirous of borrowing them? The set consists of 200 slides, contributed by about twenty-three members of the party, and form not only a very varied evening's entertainment, but give a splendid idea of the scenes visited. Almost every class of subject is represented—cathedral interiors, monuments and sculpture, canal views, street characters, the great Van Dyck procession, native dog carts, and excellent landscapes. The slides will be accompanied by a full descriptive lecture. To cover various incidentals there will be a booking fee of 2s. 6d., and each Hon. Secretary will have to bear cost of carriage one way. They will be circulated in the same fashion as prize slides and other collections—going on from town to town, and endeavours will be made to ensure short journeys. Applications with fee must be sent to me, and a list of desired dates or days should be given. A full list will then be made out. My own services as lecturer may be secured if desired. Of course, those who apply early, subject to route or town, will stand the best chance of getting their own dates.—I am, yours, &c.,

WALTER D. WELFORD.

19, Southampton-buildings, Chancery-lane, W.C.

#### THE ECLIPSE PHOTOGRAPH AT THE R. P. S. EXHIBITION.

To the Editors.

GENTLEMEN,—It were much to be desired that Dr. Lockyer should not have neglected to have seen the picture, No. 357, in the R. P. S. Exhibition before writing to you. I have not seen his photograph, but I have seen a similar one, or rather a copy of one, taken by Mrs. Maunier and published in her husband's book. In both these cases the exposure is made when only a very small crescent of the sun had reappeared from behind the moon after the total eclipse at a place where it had been total. The Exhibition picture, on the contrary, is a picture at a place where there was only a partial obscuration of the solar disc—as a matter of fact, not more than a third of the sun's diameter is hidden in it—moreover, at every station on the line of totality in that eclipse the sky was clear, whereas in the picture in question the eclipse shows through a mass of heavy cumuli, which are well lighted.

If the reversion of the solar disc had stood alone, the cause would have been evident at once, though even then we could hardly have believed in the existence of an educated man who could believe that he had got a true representation, especially as he must presumably have seen the phenomenon he was depicting, and the slightest observation must have shown him the falsehood of his result.

If a photographer were to exhibit the portrait of a very fair lady, in which, while the background and accessories were well depicted, the face was a black silhouette, we should not accept such a picture as a representation of the original; that, however, is the nearest approach to a parallel to what has been done in this case, and I can only repeat that the picture in question is not a representation of an eclipse of the Sun, either at Quetta or at any other place whatever. I am quite certain that no competent observer will differ from me. The explanation as to how it came to be shown as such a picture is one I have no particular concern with; it is a glaring case of untruthful photography.—I am, yours, &c.,

J. F. TENNANT, Lieut.-Gen. R.E.

11, Clifton-gardens, Maida Hill, W., November 4, 1899.

#### THE COMBINED BATH.

To the Editors.

GENTLEMEN,—As the member (to whom you refer in your leaderette of November 3) who, at a recent meeting of the London and Provincial Photographic Association, "expressed surprise that photographic chemists had done so little to place methods of combined toning and fixing of P.O.P. upon a satisfactory basis," may I say that I have been a diligent student of photographic literature for many years, and also that, as executive officer for various photographic bodies for several years, I have been instrumental (to an extent) in the contribution of a very large amount of matter to the photographic press. Therefore I feel that your rebuke in my case is undeserved. But, gentlemen, as you know, at the L. and P. we have the reputation of having, for the last twenty years or so, materially assisted photographic progress—in fact, the Association may fairly claim to have been of more practical utility to photographers than any other existing photographic society in the country; and therefore, in bringing this combined toning and fixing question forward, I considered we could do some good.

On investigating the matter, I found the combined bath is largely used by professionals, although more expensive than the separate bath, while the big quantities of it that can be seen in ready-made-up solutions at the photographic dealers would almost lead one to believe that the vast army of amateurs never used anything else. In fact, at our last meeting, the manager of a large photographic stock warehouse stated that, in his opinion, if it were not for the combined bath, very few amateurs would use P.O.P. at all.

Many manufacturers give the formula for a combined bath with their papers, but they invariably add that they do not recommend the same for permanency.



Photography has progressed very rapidly of late years, and are we not justified in asking the Ilford Company or the Eastman Company, or our good friend Mr. J. B. B. Wellington, to investigate the matter and give us an up-to-date combined bath that we can safely use with the magnificent printing-out papers that they issue now.

With all deference to your remarks as to "saving of trouble," I would suggest that "labour-saving" is a question of the age; and, if we can dispense with those preliminary washings, and put our P.O.P. prints straight from the printing frame into the combined bath, without fear of deterioration, thus having no more operations than with the bromide or platinotype processes, a very great saving of labour and time will result, and a great boon will be conferred upon professional and amateur photographers.—I am, yours, &c.,

THE MEMBER OF THE L. AND P. REFERRED TO.

## "COSMOS" AND THE CORNISH CAMERA CLUB.

To the Editors.

GENTLEMEN,—Your correspondent, "Cosmos," under Jottings, referred to some remarks made by the President of the Cornish Camera Club at their annual meeting. The President is reported to have said "that, given the same material and circumstances, one man could get good results while another man got only unsatisfactory results."

The person who reported the meeting should have stated that the President was speaking about various makes of plates, and one make in particular which a member of the Society is very successful with, but the President was never able to get satisfactory results with them, although with another make he was very successful. On reading the sentence as reported, I quite agree with your correspondent "that you can discuss the fact for centuries, but you will never alter it."—I am, yours, &c.,

H. TONKIN, Hon. Sec. Cornish Camera Club.

22, Market-place, Penzance, November 4.

## CHEAP ENLARGEMENTS.

To the Editors.

GENTLEMEN,—Apropos of Mr. Drinkwater Butt's letter in your last issue, what is the status of our profession (!) generally, and photographers themselves in particular, coming to? What with the dealers' "ring" round their necks, and the philanthropic newspaper "cutters" at their throats trying to choke the very life out of them, I have wondered how long shall we wait before we wake to a sense of our exclusively servile position amongst the trades of our land. Is there one other that could be coolly and quietly subjected to such barefaced and barbarous boycotting (I say "barbarous" because of its "keen" and "cutting" nature)? I venture to think not. And what's the remedy? What can we do to prevent such impudent slaps in the face? Nothing at all individually. An occasional protesting letter in your columns (much as I admire and welcome it) is of little or no use unless it be to inspire photographers to act unitedly in a body, and with one accord, and not stand aloof from each other on egotistical ground—a quicksand that has sadly injured and is daily destroying our professional vitality. Is it not so? Haven't we evidence of it on every hand and side of us? And individually we are helpless. Only by amalgamation, and that of the most strenuous and energetic character, can we hope to stem the tide of these debasing forms of opposition and oppression, which are most assuredly dragging us and our beloved art down into the lowest strata of commerce. I repeat again, we can do nothing individually in the matter. Let us therefore be united, and even now, at the eleventh hour, endeavour to organize such plans and arrangements as shall at least modify or neutralise, if not entirely quash, all such unwarrantable and unfair forms of dealing and opposition.—I am, yours, &c.,

November 6, 1899.

A PHOTOGRAPHER OF FORTY YEARS' STANDING.

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS REGISTERED:—

E. Smith, 170, High-street, Lewes.—Photograph of Southdown House, Lewes.

H. B. Collis, Westgate Studio, Canterbury.—Photograph of group entitled "Members of the Royal East Kent Yeomanry on active service in the Transvaal, October, 1899."

LENSES.—The address of the agent is H. F. Purser, 33, Hatton-garden, E.C.

T. A. FALCON.—We are obliged for your letter, but we do not publish lists of photographs that have not been registered by our publishers.

STAMP PHOTOGRAPHS.—D. L. asks: "Will you kindly tell me whether special paper is used in the printing of stamp photographs; if so, where can I get it?"—No special paper is necessary. Any paper that will do for ordinary prints will do equally well for stamp portraits.

FORMULA WANTED.—C. CLARK says: "I want a good formula for making a gelatino-chloride P.O.P. that will keep white. I should be much obliged if you could tell me of one."—In reply: Barker's formula, given at p. 1040 of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1899.

COPYRIGHT.—ANXIOUS asks (1) if it is necessary to put the word "copyright" on the work you have registered before publishing? (2) "Could I claim damages against any persons who pirated my picture if the word 'copyright' was not on?"—In reply: 1. Not necessary. 2. Yes; decidedly.

VERY RAPID PRINTING PAPER.—W. G. H. asks: "Can you inform me if there is a paper that will print black in the course of two minutes by the rays from magnesium wire?"—Any of the bromide papers will do what is desired, but the prints will have to be developed. There is no printing-out paper that will fulfil the requirements, unless, indeed, a very large quantity of magnesium be consumed.

MAKING ALBUMEN PAPER.—PRINTER says: "Kindly inform me of the best method of making ready-sensitised albumen paper, that will keep good for a few weeks or months, that will give good prints and not spoil the toning bath."—By making albumenised paper, we presume you mean sensitising it only. If that is so, you will find a formula for that on p. 1048 of the ALMANAC for the current year.

PHOTOGRAPHING THE LEONIDS.—THE MAJOR says: "I should be much obliged if you would kindly let me know if it is possible to obtain a photograph of the (meteors) shooting stars that will take place this month. If I use an eight-inch focus stigmatic at  $f/6$  on whole-plate, to what extent is it necessary to expose to obtain an image on an instantaneous plate?"—In reply: Quite possible. See the article on the subject in another part of the JOURNAL.

FORMULA WANTED.—DEVELOPER says: "I have the same trouble as other of your correspondents at this time of year, viz., late sitters, most often young children and family groups, and I have great trouble in getting printable negatives. Can you oblige me with the formula of the best developer for getting the most detail in the plate?"—It is claimed for some of the newer developers, such as kachin, ortol, metol, &c., that they will bring out more detail than some of the older ones. But it is obvious that, if the negatives are so much under-exposed that the light has not impressed the shadows at all, no developer can bring out detail in them. Try the above.

RUBBER STAMPS.—STAMPS says: "Would you kindly inform me how rubber stamps are made? Can I obtain any book of instructions? I am experimenting for the purpose of making relief stamps by a process of photography, and wish to make the stamps myself."—The method of making rubber stamps would take up too much space to describe in this column, and, moreover, the subject is not a photographic one—or one of interest to our readers. We know of no book on the subject. Messrs. Richford, Snow Hill, London, are makers of rubber stamps, and they will probably make what you require. If you were to make them yourself, you would require a vulcaniser and other appliances.

TONING TROUBLES.—J. S. says: "I wonder whether any one can explain why my last batch of prints are in two colours: the sea is pale blue, and rocks on each side are dark brown, the effect being much admired by all who see them. Paper is Eastman's Solio, whilst the combined toning and fixing bath was made by myself from *Barnet's Book of Photography*, p. 184 (the first of his list) only I left out table salt, and the gold was solution of chloride of gold; as prints were slow in toning, I added more solution of gold to bath, and was greatly surprised to find two colours in all of them."—This is a case of double tones. The formula, as given in the book, should have been adhered to, and the gold not added while the prints were toning. The gold should have been added some time before the bath was taken into use.

LANTERN QUERIES.—A. GREGSON says: "I have often seen it mentioned in LANTERN articles that the focus of a condenser should suit the focus of the objective, but I do not remember seeing it stated what particular focus of condenser should be used for any particular lens, therefore I should be glad to have an answer to the following:—1. How and by what method is the focus of a condenser to be found to suit any particular lens? 2. What condensers are best suited for a lens of six-inch focus, and one of ten? 3. Is there any work dealing with this part of the subject, i.e., the optical part? 4. How often should a lime be turned when used with a blow-through jet? 5. How much oxygen gas will a good blow-through jet use in two hours?"—1. 2. 3. Taylor's *Optics of Photography*, published by Whittaker & Co., will give the information desired. 4. As often as it is found necessary. Some limes require more attention than others. They should be watched and not allowed to burn into holes. 5. That all depends upon the orifice of the jet—from four to eight, or more, according to size and pressure.



**NEGATIVE FROM A PRINT.**—A. C. R. says: "I wish to make a negative from a print, will you kindly tell me how I can copy same size? I have a Lancaster's half-plate camera, also a Lancaster's enlarging camera, enlarging up to  $10 \times 8$ ."—If the camera will extend to double the focal length of the lens, the negative can be made direct, the print being placed at the same distance from the lens as that is from the ground glass. If the half-plate camera is not long enough for that, the best way will be to make a small negative and enlarge it in the enlarging camera.

**COPYRIGHT; INTENSIFICATION.**—COPYRIGHT asks: "1. If a photographer takes a view for which he does not receive payment, but which he does not register at Stationers' Hall, and finds that the photograph has been copied, if he then registers it, can the copier be proceeded against (a) for selling the copy of photograph before registration; (b) for selling copy after registration? 2. When intensifying negatives, I sometimes find a brown patch resulting after the negative is washed and dried and ready to print. This occurred on a negative which was intensified in feeble daylight, and the intensifier was acidified with HCl, and previous to intensification the negative was soaked in a weak solution of HCl. What is the cause of the brown patch?"—In reply: 1. It is doubtful if damages could be recovered in the case of (a), but, as regards (b), an action would undoubtedly lie. 2. Probably the hypo was not thoroughly removed from the film.

**VARIOUS.**—"ONE WHO WANTS TO KNOW" asks: "1. What are the duties of a studio and dark-room assistant? 2. In developing with pyro ammonia, I get a lot of green fog. Can this be avoided? I use Ilford plates. 3. Are there any books published on the following subjects, where are they obtained, and the price: Lighting and posing; the uses of swing back and rising front in cameras; working up plates, and printing and developing them; and one on lenses, explaining which to use for various subjects, and also explaining the use of stops?"—1. To develop negatives and to assist generally. 2. You ought not to get green fog with these plates. Try pyro soda, or some of the newer developers. 3. A work on lighting and posing is published by Dawbarn & Ward, Farringdon-avenue; *Platinotype*, by Abney (Piper & Carter, Farnival-street). Working up the prints. No special work on the subject. Taylor's *Optics of Photography*, published by Whittaker & Co., will give the other information.

**DISPUTED AGREEMENT.**—AGREEMENT says: "I contemplate opening a small first-class business in Prestwick, a few miles from Ayr, N.B., but in the county of Ayr. Now, three years ago I was employed by a firm at Ayr, and signed an agreement for three years, and in it was a clause not to work for any other photographer in the county, or start a business for a period of seven years from the natural termination of agreement. Well, before the first year had elapsed things were very unpleasant, and I wished to get back to London; so we both agreed to acknowledge the agreement void, and leave amicably, which I did. I might also state that there was another clause in which it stated, should either party break the agreement before the three years were up, we were both liable to a sum not exceeding 70*l*. Do you think that, after stating these facts, there is anything to fear from that agreement?"—The agreement should have been cancelled at the time you arranged to leave. If it was not, it is still in force, though, under the circumstances, we do not think it would have much weight in a court of law. However, we should recommend you to take the advice of a solicitor on the matter before you do anything further.

**DISPUTE WITH SITTERS.**—VERAX says: "Will you kindly inform me what is the legal position of photographers in such cases as the following:—A lady comes to my place and makes an appointment; on the day appointed she sends two of her daughters to be photographed together and separately. I take a number of photos in cabinet and *carte-de-visite* sizes, and send proofs (ten), mounted and finished. They are good photos. The lady brings them back in a day or two, and says she doesn't like any of them; they are 'caricatures.' I ask her to send the young ladies again for another sitting. She replies, 'I don't know, it is too much trouble.' Nothing was asked as to my charge or prices of photos. Am I entitled to charge for making the ten negatives? And in making out a bill would you advise that I should simply charge for making ten negatives, and say nothing about proofs (as they were all returned), or charge as, 'For work done to order,' so much?"—Evidently the portraits were not good, or the lady was very difficult to please. We should say your best plan would be to send back, say, two or three of the portraits and make your regular charge for them. If you charge for taking ten negatives, they will become the lady's property. If you, as some photographers do, put on your price list "satisfaction guaranteed," we suspect you can make no charge at all, as the portraits are not satisfactory to the sitter.

**BACK NUMBERS OF THE JOURNAL.**—H. B. writes: "Will you kindly tell me how I can best procure the back numbers of your JOURNAL which treat of the making of emulsions (the experimental work). Nothing is now said about it, and when I first took in your paper the subject was dying out. Will you kindly say what years would be best, whether I can get them on hire from your office; if not, whether on sale, and at what price? I would rather have them on hire, as I only want to read them and return. If not procurable through your favour, I must advertise in your list. I have read all Abney, &c., but there are many points which are either only assumed or not touched, and I might gather what I want from the multitude of councillors." In reply: The numbers and volumes in question are long since out of print. We should recommend our correspondent to advertise for the volumes for the years 1879-1885 inclusive. These will give him practically all the information available on the subject.

**STAINS ON PRINT.**—COLLODION says: "I should esteem it a great favour if you would kindly inform me the cause of the yellow stains showing in matt surface print I now herewith send you. It is printed, and toned with platinum and gold baths and fixed according to instructions given, it is a matt surface collodio paper print. We hand-wash the prints for fully forty-five minutes and then about thirty to sixty minutes in running water to finish up. This print was returned to me yesterday, only being a fortnight sent home to my client, it is one out of a dozen supplied, and he is wondering if the rest I supplied will go the same way. I have never been troubled until now with these spots, but our branch studio at Strathpeffer has been troubled with yellowish marks like what I now show, but they do not appear for some days after mounting. Every care has been taken in keeping baths clean and pure and up to strength; of the mount I do not think there is any fear, but I shall be glad if you can find out cause or give me any indication as to what might be probably the fault, if any, on our part. There have been a few small reddish spots also like size of pinhole on some of prints done lately."—The stain appears to be due to imperfect fixation, i.e., the prints being allowed to stick together while in the fixing bath, so that the hyposulphite of soda did not have free action at those parts where the stains appear. More care in the fixing operation will avoid them in future, we have little doubt.

**A BUSINESS MATTER.**—DIFFICILIS says: "Last year I purchased a business, a clause in the agreement of the purchase being, 'Mr. — will sell and Mr. (W.) — will purchase at the price of — the goodwill and business of Mr. — as photographer as carried on by Mr. — at —, and all the cameras, lenses, negatives, photographic apparatus, accessories, appliances, and materials, and such of the other contents of the studio, changing room, reception room, and dark room at — aforesaid as appertain to the said business, but exclusive of any private, household, or domestic furniture or other articles which may not have been used by Mr. — for business purposes only.' The purchase was completed, and I entered into possession. I had been told that everything was in order, but soon discovered, on repeat orders coming in, that some of the negatives, at any rate, were out of place, and several times I had to ask the assistance of my predecessor in finding them. Later, I discovered signs that many were missing altogether, and for several months past I have been devoting all my spare time and that of an assistant to putting them in order and checking them. I have just completed the work, and find by the books and negatives as follows:—

Number of negatives in books (approximately)	2984
Number of negatives missing:—	
1/2 plates (approximately)	61
2/3 " "	100
1/4 " "	3
1/8 " "	20
1/16 " "	12
Uncertain sizes	148
Total missing	344
Number of negatives on shelves	2640

\* I have classed these 'uncertain sizes' because, for some time after the business commenced, cabinet, *cartes-de-visite*, and midgets, appear all to have been taken on half-plates, and in some later instances sizes are not given in book. Will you kindly give me your opinion (a) as to whether I have or have not a claim against my predecessor for the missing negatives, a very large proportion as you will see? (b) As to the valuation of the missing negatives. I ought to say: (a) That I do not wish to make any exorbitant claim; (b) That I have actually been unable to execute orders in one or two cases already for copies from negatives that are on the books but not on the shelves; (c) That the business was commenced by my predecessors themselves about four and a half years ago; (d) That the figures on previous page only include negatives up to the time of my succession. I shall further be glad of your opinion on another point: My predecessors took several negatives of one another (i.e. husband and wife), and of their children. Some of these were certainly used for business purposes, e.g., an enlargement from one of them was made and hung in the reception room, where it still remains. To whom do these negatives belong, to myself or my predecessor? (See copy of clause in agreement on p. 1.) I forgot to say that the negative specially instanced above, and others as well, were also used for preparing prints for the show-cases, in which some of them were still at the time of my incoming. My predecessor begged some of these prints (i.e., from the cases) from me when I changed the cases—*begged*, not *claimed*.—We are a little doubtful if you could sustain any claim, unless you can show that your predecessors removed these negatives, and are now making use of them for business purposes. There does not appear to be any definite number of negatives mentioned in the agreement. Some may have been broken, and others lost, or many other things—sold to the sitters, for example. The number of missing does not appear to be, under the circumstances, in a business of four and a half years' standing, very excessive, after all. The family portraits, the negatives of which you think you ought to get, were clearly not taken for business purposes, though some of them might have been used as specimens. We do not think you are entitled to these. You must excuse us saying that we think you are a little unreasonable in the matter.

\*. Several answers to correspondents are unavoidably held over.



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## EX CATHEDRA.

A PROCESS of printing with phosphate of silver, as was seen by our last week's issue, has been patented by Dr. Johannes Meyer, of New York. In his specification the Doctor says, "The silver phosphates have so far not been employed for photographic or other purposes, and the only mention of any application made of them is to be found in *Hardwick's Manual of Photographic Chemistry*." He writes: "other insoluble salts, such as the phosphate and citrate, render the paper more sensitive than when it has been treated with a soluble salt of silver only." Evidently, Dr. Meyer is not aware that a phosphate of silver printing process was published in this country something like fifty years ago, which is not materially different from that which has just been patented.

It was invented by Dr. Fyfe, and is thus given in Hunt's *Researches on Light*, published in 1854: "The paper should be soaked in a solution of phosphate of soda, and then dried, after which the nitrate of silver is spread over one side of the paper by a brush; the paper is again dried, and afterwards

put through the phosphate, by which any excess of nitrate of silver is converted into a phosphate. Although papers thus prepared answer exceedingly well for copying by application, they do not change so readily as to render them of any use in the camera obscura. One advantage possessed by these phosphate papers is the readiness with which they are fixed by the application of a weak solution of ammonia. . . . Dr. Fyfe recommended the application of the precipitated phosphate to paper, glass, or metal, in the form of a paint, and, if this is carefully done, some very pleasing effects are to be produced." It will be noted that Dr. Meyer claims that his solution or emulsion can be spread over almost any surface like a paint, and mentions paper or other material, such as wood, celluloid, lithographic stone, silk, cotton, or other textile fabrics, and other materials.

\* \* \*

It will be interesting to quote a little more from Hunt on this process: "After the phosphate has been darkened by exposure to sunshine, it is very readily bleached by the joint agency of the solar rays on the iodide of potassium. This was the process published by Dr. Fyfe for producing positive photographs by one application at a very early period. Other processes were found, however, to give much more satisfactory results, and it is now but seldom used." Here we have proof that the phosphate process had been used in practice. It is also noteworthy that Hunt, writing in 1854, says that Dr. Fyfe's method was published "at a very early period." Verily there is nothing new under the sun, particularly in connexion with photography, as is evidenced by the many rediscoveries made from time to time of the older processes and the patents obtained for them.

\* \* \*

THE above rediscovery of one of the oldest processes of printing exemplifies what we have more than once said, namely, that experimentalists and would-be discoverers would do well to give attention to some of the older processes of photography in conjunction with modern knowledge of the principles upon which they are based. The outcome would probably be that some very useful processes might be evolved and with great credit to the investigator.



At the review of the Life Guards on Saturday, by the Queen, when she wished them God speed and a safe return, the ceremony was photographed by Messrs. Russell & Son, by command; and the report says that Her Majesty did not desire the cinematograph to be used. Now, in cases where the Queen "does not desire" a thing to be done, it is generally understood that she objects to its being done. Be that as it may, a series of pictures representing the review of the troops, whether they were obtained surreptitiously or otherwise we do not know, were shown at the Palace Theatre the same evening, and received with the greatest enthusiasm. The films, we are told, were developed on the return journey from Windsor. The fact that the pictures were obtained, and the films developed, and the transparencies made from them, and exhibited on the screen within a few hours, shows a degree of photographic enterprise little dreamt of a few years ago.

\* \* \*

QUESTIONS have more than once been asked in the House of Commons with reference to the absence of Röntgen-ray apparatus in previous campaigns, and the replies have referred to the difficulties attendant upon its transmission, &c, and that in no case had a wounded man suffered from the absence of the Röntgen apparatus, and the like. Some of us, however, may have ideas that differ from those who gave such replies. It must be useful on any battle-field where rifles and artillery are used. It is therefore satisfactory to know that the Army Medical Corps, now on its way to, and arriving at, the Transvaal are provided with the necessary appliances. We read that the Duke of Newcastle, who, it is well known, is an enthusiastic photographer, is bearing the entire expense of the fitting out of the hospital ship the *Princess of Wales*, and, of course, the necessary Röntgen-ray apparatus will not be omitted. We also learn that a private donor has undertaken to provide a complete Röntgen-ray and photographic apparatus for the hospital ship *Spartan*. If, up to the present campaign, the War Office have ignored the value of Röntgen's discovery, they are now alive to the fact it is very valuable. Thanks are assuredly due to those donors who have provided it for the hospital ships at their own cost.

\* \* \*

COMMANDER WELLS, R.N., the Chief of the Fire Brigade, reports that a serious explosion occurred at Dalston last week, during a display of fireworks, in which seven persons were injured, four so seriously as to necessitate their immediate removal to the hospital, through the explosion of about six pounds of chlorate of potash. Up to recently, chlorate of potash was thought to be, by itself, a perfectly harmless material. It is perfectly true that explosions, sometimes fatal, did occasionally occur when lanternists had, perforce, to make their own oxygen, but then the cause was always attributed to the chlorate containing some carbonaceous matter. This, if we mistake not, was the decision when one of the Messrs. Wrench was unfortunately killed some few years ago while making oxygen. Some little time back, when there was an explosion at the chemical works of the United Alkali Works at St. Helen's, and five persons were killed, and the surrounding buildings were wrecked, the same opinion was expressed.

\* \* \*

THIS appears now to be a fallacy, for in his report on this catastrophe, issued a few days ago, by Col. A. Ford, Her

Majesty's Chief Inspector of Explosives, he says that, so far as he has been able to ascertain, an "explosion" of potassium chlorate had hitherto been unknown in the United Kingdom or in any other country. But, in order to further test the matter, experiments were carried out, with the result that it was found that the salt, after all, is liable to explode under certain conditions. The Colonel adds that it cannot be doubted that the explosion at St. Helen's of a small portion of the chlorate took place, this portion being, doubtless, raised very rapidly to the required temperature by the intense heat caused by the burning empty kegs. At present photographers and lanternists, as they can get their oxygen ready-made, are not so interested in chlorate of potash and its properties as they were formerly when they had to make the gas for themselves. Still it should be borne in mind, by those who are yet compelled to make their own oxygen, that the chlorate of potassium is not the harmless material that it has hitherto been considered—that is, when used under certain conditions.

\* \* \*

In reference to an apology published in the advertisement columns of the present issue of this JOURNAL, the Britannia Works Company, Limited, inform us that, this being the first case of a breach of the rules brought to their notice, they wished to treat it leniently. They add that, in all future cases, the action will be carried into Court, and the fullest penalties and costs will be insisted on.

\* \* \*

It is understood that amateur photographers will receive excellent treatment at Paris. The French Commissioners have made a ruling concerning the taking of pictures at the Exposition. Cameras will be allowed on the Exposition grounds after a permit has been secured from the Exposition authorities. A charge of ten centimes will be made for this, and the applicant will be required to furnish his name, age, and other personal data, together with his residence in Paris. Only the buildings and general groups can be taken. Photographs of individual exhibits will not be allowed, as the patent laws of France guarantee the patentee against photographs of articles exhibited.

## PICTORIAL PHOTOGRAPHY.

THE case for pictorial photography, from the Salon point of view, is very ably and clearly presented by Mr. Alfred Steiglitz, in the current number of *Scribner's Magazine*. His contention is, that photographic tools being "pliant" ones, and not "mechanical tyrants," granted a technical knowledge of their use, supplemented by an all-important supporting buttress of true artistic feeling and knowledge of composition, photography can rise to heights of expression approximating in kind and merit to that of the artist. Dr. Emerson is quoted in support of the points, to the effect that "the painter learns technique in order to speak, and considers painting a mental process. So photography, speaking artistically, is a severe mental process, and taxes all the artist's energies even after he has mastered technique. The point is what you have to say, and how to say it. That our technique is more difficult to learn no one will deny; but the greatest thoughts have been expressed by means of the simplest technique—writing." The necessity for artistic feeling is, of course, readily granted in all photographic work worth looking at, except in such exclusively mechanical directions as taking machinery, and so on,



where very conceivably its possession might militate against the desired result. So is the necessity for a thorough knowledge of technique, otherwise of photographic tools, and the best way of using them; but that those tools are "pliant" ones comes confusedly with the shock that Mr. Steiglitz, in the course of his article, anticipates will be the case "to many who have tacitly accepted the popular verdict to the contrary." That photographic tools have a certain range of working no one will deny, nor that the range is directly proportionate to the capacity of the worker. That the range can be more specially utilised for the accomplishment of a particular object, and to great advantage, pictorial work for instance, is also clear. One worker, by his superior knowledge of what form of lens to use, how and when to use it to greatest advantage, his further knowledge of developing and printing, can turn out a very different result to one less capable. This, however, is not pliancy of tool, but knowing how to get full value out of it.

The tool is very stiff and unyielding, and very soon, by comparison with others, such as the artist's pencil or brush, cramps the action of hand using it however skilful it be, and the directing brain however capable. The very essence of photography is its truth, and that truth is immediately dependent upon the narrow margin allowed by the severely mechanical nature of the tools, and the use made by their means of stiff, unbending optical laws. We are very fond of exalting this prime feature at need in calling attention to the correctness of detail, texture, and form of a photographic representation, and it can hardly in reason be claimed for photography that it forms an exception to the universal law that no means can rise to excellence in accomplishing diametrically different effects. Yet this is what is done when the photographer's picture is put so prominently forward for comparison with that of the artist. The artist would not pretend to be able to turn out anything of photographic truth and detail by means of brush and pencil, even were he desirous of doing so. The chief cause for the opposite lack of modesty—or better, perhaps, the lack of appreciation of the broader proportion of things—on the part of the photographic worker, paradoxical though it may seem on the face of it, is really highly creditable to him, viz., so keen a feeling for the artistic side that he wishes to express it in a better way than the orthodox photographic print. One always feels rather sorry, in a case of this kind, that instead of wasting so much high effort in such misdirected ways as straining a lens beyond its power, piecemeal developing, and dodging light in printing, the more suitable methods of the artist have not been taken to. It is as though a mason were trying to carve wood with his chisels, or, *vice versa*, a carpenter blunting his tools upon stone. If one craves for the work of the other, why not change places and tools? Mr. Dallmeyer, in a small pamphlet upon lenses, what they are expected to do and what they cannot, very aptly gives one item of the latter as the inability to register a result identical with so peculiar a lens, "physiologically and psychologically," as the human eye.

This exactly hits off the cause of the superior excellence of the artist's work. His is an effort more or less good in the opinion of the critic, as his physiology and psychology is more or less like those of the artist, to express the desired subject as he sees it, and with the feeling of excellence he attributes to it. His method admits of it, the photographer's does not. What comparison in terms of labour and brains can there be between an artist, with his pencil or brush, and a photographer with his camera, setting about the picturing of a landscape scene for

instance? We will admit that their appreciation of the scene is equally keen and equally artistic. One, after carefully seeing that all the mechanical conditions necessary to success are all right, uncaps his lens, or presses his pneumatic bulb, and the thing is practically done. The other, after taking the same pains in seeing that conditions of light, point of view, and so on are favourable, has not started with his work. Instead of having it mechanically done for him in a second or two, he has to select here, reject there, turn different values and impressions loose in his brain and fancy, mould them to the expressing point that long practice and diligent study have educated him to regard as practicable and pleasing; but that is only half the work, less than a half, execution remains; the correct rendering of form, perspective, and light and shade; the capacity for doing which he has acquired in a far different and more laborious fashion than the photographer has that for handling his camera. What it really does mean it would do many photographers priding themselves upon their accomplishments in exposing, developing, and printing, a great deal of good to go in for it only in a minor experimental fashion; and which is the more likely to give satisfaction as a finished result—the sketch with brains behind each pencil stroke, and the scene carefully studied before each is put down; or the print which the photographer brings out in the obscurity of the dark room by "brush development, forcing here, restraining there, keeping all the while a proper relation between the different parts that the whole may be harmoniously in tone?"

It reads uncommonly well, it must be admitted, and so does the further statement that "the plasticity of the whole processes is such that, with the actual beauties of the original scene and its tonal values ever before the mind's eye during the development, the print is so developed as to render all these as they impressed the maker of the print." But will it work out? The trained artist will not admit that it will often indeed expresses with marked emphasis his conviction to that effect. Mr. Steiglitz, on the other hand, says it will, and honestly believes it, for his article has the stamp of genuine enthusiastic conviction about it. Further, he submits half a dozen pictures, presumably made by the means he advocates, in proof of his point. The pictures are good, show a keen artistic feeling, but are ones that could certainly be produced by the ordinary use of photographic tools, possibly to greater advantage. The secret of their success is due more to the judicious selection of subject, that in the absence of obtrusive detail offers a pleasing suggestion to the imagination, emphasised by the well-selected titles to the same end, than to any special method of working. Comparing the pictures with those which an artist of such capacity in his particular direction as the photographer is in his would produce of the same subjects, it may very safely be said that the artist's would be immeasurably superior. The simplicity of the artist's tools leaves an inevitably larger place for the exercise of brains and deft manipulative skill. The essentials that from the creation of the world, or at least that point in the history of the world at which they became recognisable quantities—the first sketch of the mammoth on his horn by the hunter who had killed him maybe—have commanded, and justly, the highest place and deference. That this instinctive paying of respect is a true one, and capable of very much wider application, may be argued from the superior place universally given to a "hand-made" article over the "machine-made" one—at bottom a tribute to what best deserves honour, active brain power.



**Aqueous Solutions of Metallic Gold.**—R. Zsigmundi has lately given a detailed account of a method of preparing a solution of metallic gold in water, a sufficiently wonderful achievement when it is remembered that in the middle ages a method of dissolving gold in any medium whatever was the perpetual quest of the alchemists, they being under the belief that, once found, they would possess an *elixir vite*. We are not aware that such a solution will have any direct photographic usefulness, but gold plays such an important part in all prints with a silver basis that it is impossible to foretell where its functions will end. Zsigmundi makes 25 c. c. of a solution of ordinary acid chloride of gold of the strength of 0.6 gramme per litre, and dilutes it with four to six times its bulk of distilled water, and 2 to 4 c. c. of a decinormal solution of carbonate or bicarbonate of potassium. After bringing the mixture to boiling point he adds carefully and rapidly 4 c. c. of a one per cent. solution of formic aldehyde (formalin) freshly distilled, and stirs the whole of the time. The solution, at first colourless, quickly becomes a brilliant red. This solution, containing 0.005 per cent. of gold, can be boiled or kept several months without change. He arrives at the conclusion that the gold is not in the form of minute particles of metal in suspension, but is a true solution.

**The New Radio-active Element.**—This substance, recently referred to by us, is described in the *Chemical News* in a short article by its discoverer, M. A. Debiere. M. and Mde. Curie's experiments had already enabled them to discover in pitchblende two new substances, elements which they termed polonium and radium, bodies possessing far greater radio activity than the chief constituent of the ore, viz., uranium. M. Debiere states that the new metal (still unnamed) has chemical properties entirely different from the above named two, and is different also in regard to the radio activity. The former are spontaneously luminous, while the new metal is not. It is probable that eventually it may come to the front in radiation experiments, but, up to the present time, the small proportion in which it is present virtually bars the way to extended experimental work. To obtain the small quantity he experimented with, he had to work upon several hundredweights of the raw material. He estimates its radio activity as 5000 times that of uranium, at one time considered a very remarkable body as regards the Röntgen-ray-like power of its radiations.

**The Action of Light on Silver Iodide.**—In a German technical journal Herr H. Scholl writes upon the action of light upon iodide of silver, *per se*, and, when backed with a layer of metallic silver, the latter being the condition of a sensitive Daguerreotype plate. In the first case, as instanced by a silvered glass exposed to iodine vapour, the unexposed iodide is clear, but, when acted upon by light, cloudy. Herr Scholl shows this action is simply a mechanical alteration, the change requiring the further catalytical action of some oxidising agent, such as oxygen or iodine; but in the second case, iodide upon a surface of silver, chemical action takes place iodine is liberated, and it combines with the silver surface by above catalytic action, accelerating the change. The capability of development of the Daguerreotype plate is due to this change and the presence in the surface layers of reduced silver; it extends through the whole thickness, and is throughout proportional to the light intensity at the surface.

**Anti-mould Reagents.**—In an article by Mr. J. F. Clarke on an electric aspect of anti-fungi toxins, some useful hints as to the action of various chemicals can be obtained. The presence of mould too often makes its influence felt in an unpleasant manner in many photographic processes and preparations. Thus, gelatine and flour pastes are peculiarly liable to the attacks of mould, and gelatine prints are by no means free under suitable conditions, while solutions, such as of citric acid, &c., quickly become cloudy from the presence of fungus-like bodies. But many of the gelatine preparations in use in photography possess their own antidote. For example, potassium chromate and bichromate have a strong toxic

action, and come closely after either potassium cyanide or nitrate of silver. In the same category are found mercuric chloride and nitrate of silver, and formaldehyde or formalin, while the mineral acids—hydrochloric, cupric, and sulphuric—have a very low toxic power upon fungi.

**Removing Lime and Magnesium from Natural Waters.**—It is well known that some waters are so contaminated with these earthy matters as to militate against their use in photographic work, but a paper by Mr. Martin L. Griffin in the *Journal* of the American Chemical Society gives a *résumé* of the best way of removing these substances. For carbonate of lime the most effectual agents are caustic soda and fluoride of sodium, and, in certain cases, aluminate of sodium. Waters containing a large proportion of carbonate and sulphate of lime can be successfully treated in the same way. Caustic baryta is not so good, but is effectual for magnesium salts, though the caustic soda treatment is slightly better.

### THREE-COLOUR TRANSPARENCIES.

M. LÉON VIDAL, the well-known editor of our contemporary, *Le Moniteur de Photographie*, describes the following method of preparing trichromatic transparencies by the superposition method in the *Bulletin du Photo-Club*.

Three negatives are obtained, one for the red rays, another for the green, and the third for the violet.

The taking screens are made as follows:—

*The Reddish-orange:* Yellowish eosine, 2 parts; naphthol yellow, 1 part; water, 100 parts.

*The Green Screen:* Sulpho-green I., 2 parts; naphthol yellow, 1 part; water, 100 parts.

*The Violet Screen:* Methylene blue, 2 parts; Paris violet, 2 parts; water, 100 parts.

Filter, and allow the plate to be coloured to soak for five minutes, rocking the dish all the time.

Ordinary dry plates, fixed in hypo and well washed and dried, may be used, but they must be placed next the plate.

Lumière's panchromatic plates may be used, but orthochromatic plates, specially sensitive to red, to yellow, and the ordinary plate, may be used equally as well.

In order to obtain the transparencies thin, rollable celluloid films should be used, and cut to the required size, and immersed for two minutes in a bath of bichromate of potash, 0.75 per cent., and then dried in the dark. They should be exposed behind the negative, with the negative in contact with the film, and require from five seconds to two minutes in direct sunlight, but it is preferable to use an actinometer.

Development should be effected in hot water at about 40° to 50° C., and then the silver bromide should be dissolved out by clean hypo, and the film well washed.

For the blue film methyl green should be used; for the red, erythrosine; for the yellow, a mixture of yellowish eosine and naphthol yellow. The films should be soaked in these solutions till of the desired intensity, and then, when dry, they may be fitted together.

### THE COLOURING OF LANTERN SLIDES.

In the *Bulletino della Soc. Fot. Ital.* Roster points out that in colouring slides the best results are obtained with aniline colours, and that it is important that the colours should not destroy one another, and he suggests the following as satisfactory. *Blue:* Indigo carmine. This is the best colour for the sky. *Green:* (a) Malachite green. This is very brilliant, and must be sparingly used, and it is difficult to spread it evenly on large surfaces, and it is not suitable for plants and foliage. (b) A mixture of tropælin O and indigo carmine is the best for foliage, and, according to the proportion of these two, a cold, a brilliant, or a yellowish green is obtained, and also the colour of dead leaves. *Yellow:* (a) Tropælin O for bright yellow, mixed with eosine it gives flesh tints. (b) Mixtures of tropælin O and orange for darker and golden yellow. (c) Orange alone. *Red:* (a) Eosine for a bright red. (b) Mixture of eosine and orange for brilliant fiery red. For *Brown:* (a) Bismarck



brown or vesuvin; the former is to be preferred for warm brown tones. (b) Mixtures of Bismarck brown and indigo carmine for cold brown tones.

The separate colours, as well as the mixtures, may be kept in stock in stoppered bottles. A retouching desk should be used with a sheet of white paper as a reflector, and the plate slightly tilted. The reflector should be about four inches from the plate.

The transparency should be allowed to thoroughly soften by soaking in water for half an hour, then blotted off with blotting paper, and placed on the retouching desk. The colours should be applied with a camel's-hair brush in a very dilute state, and the operation repeated to obtain the necessary intensity. After every application the excess of colour should be removed with a sheet of blotting paper. When colouring large surfaces, it is advisable to pass over it a broad brush dipped in plain water before blotting off; this evens the colour. In working up the sky the transparency should be turned upside down, and the colour applied from the landscape, a natural gradation will thus be obtained.

### PERSULPHATE OF AMMONIA.

[Paper read before the Edinburgh Photographic Society.]

PERSULPHATE of ammonia, a white crystalline salt, somewhat deliquescent, and represented by the chemical symbols  $\text{NH}_4\text{SO}_4$ , was introduced to the photographic world a little more than a year ago by Messrs. Lumière, to whom photographers are indebted for so many good things in applied chemistry, and the advantages of its peculiar action were soon recognised—that of dissolving away the denser masses of metallic silver in apparently much greater proportion than it removes the thinner and more superficial layers which form the half-tones and faint details in the shadows, and it is now considered a very necessary addition to the laboratory. More especially, perhaps, is it useful to the inexperienced amateur, whose negatives so frequently partake of the soot-and-whitewash-giving variety. It is in this class of negative, under-exposed and over-developed, that the characteristic action of the persulphate is found most beneficial, as by it the over-dense high lights can be thinned down to any extent required, while the half tones and shadow detail are acted on to a comparatively slight extent, so that harsh contrasts are greatly modified, just the reverse of what would take place when using the ordinary ferriocyanide of potassium and hypo reducer (Howard Farmer's), with which the half-tones and faint superficial details would be cleared off before the high lights were much altered.

The chemical reactions which bring about this apparently paradoxical result do not appear to be as yet thoroughly understood, and considerable discussion is still taking place between the upholders of the various theories in the endeavour to account for what seems to be, at first sight, a selective action of the persulphate on the denser parts of the negative.

The hypothesis put forward by Messrs. Lumière is that the chemical action takes place chiefly in the deeper parts of the film, and the silver dissolved out as a double sulphate of ammonia and silver is again partly reduced to metallic silver on coming in contact with the excess of persulphate in the surrounding solution, which metallic silver is redeposited on the surface of the film, thus keeping up the average density there at the expense of the silver removed from the deeper parts of the film.

The amount redeposited is, however, less than that removed, so that, by prolonging the action of the reducer, the whole of the negative image would be in time obliterated.

This explanation of the action of the persulphate is not considered entirely satisfactory by later observers, and the general opinion among them appears to be that a uniform reduction takes place throughout the film, in direct proportion to the density or mass of the silver molecules in each part of the film—that is to say, that if reduction were continued until, say, a third of the image were removed from the densest high lights, exactly a third of the image would be removed in all other parts of the film.

It occurred to me that, if Messrs. Lumière's theory were correct, a negative made by exposing the plate in the camera with the glass side to the lens, ought, on being treated with the persulphate, to have the same appearance as an ordinary negative treated with Farmer's reducer—that is to say, the half-tones and shadow details, now lying in the deeper parts of the gelatine film and in contact with the glass, would be the first to disappear, leaving a negative with stronger contrasts than before treatment.

To test this, I exposed two plates on the same subject, one in the usual way, film to lens, the other reversed, glass to lens; they were exposed for the same time, and developed together, development being adapted to give extreme density in the high lights. They were then reduced together with persulphate of ammonia, and the result, which I pass round, was that both negatives were of much the same character, with no special loss of thin detail in either. This proves, at least, that the persulphate has the same action on the silver image, irrespective of its position in the

gelatine film, and bears out the opinion of recent observers, that the action is more of the nature of a reduction of the amount of development, and is uniform throughout the film in proportion to the deposit of silver. This opinion is also supported by the result of photometric measurements.

Now as to the practical application of the reducer. If the negative has been dried, it should be soaked in water for at least half an hour to soften the film.

I find that the most workable strength for the solution in which the negative is to be immersed is about three per cent., say 15 grains to each ounce of water. It dissolves easily, and, as it appears to be unstable in solution, it should be freshly dissolved shortly before use.

When the desired effect is produced, the action can be stopped at once by immersing the negative for a minute or two, after a slight wash under the tap, in a ten per cent. solution of sulphite of soda. The plate should then be well washed and dried. The silver image acquires a slight pinkish hue, which becomes deeper if left too long in the sulphite of soda solution.

Ammonium persulphate, although a powerful solvent of metallic silver, has no chemical effect on silver bromide. Advantage can be taken of this property to make reversed negatives by contact direct from the original negative, and also to make positives instead of negatives direct from the camera exposure.

To make a reversed negative by contact from the original negative, the process is roughly as follows: The exposure having been made in a printing frame, as for a lantern slide, the plate is developed in the usual way; but, instead of being put into the fixing bath, it is placed in a strong solution of persulphate, from six per cent. to ten per cent., by which the positive silver image is dissolved out of the film. The bromide of silver remaining can now, after a short exposure to light, be developed, and forms, of course, a negative image. To make a positive direct from an exposure in the camera, the procedure is the same, the negative image in this case being first removed, and the positive which is left being developed and fixed.

I made several attempts to produce a reversed negative by this process, but without much success. They all turned out very flat and foggy affairs. It seems very difficult to get rid of a residuum of reduced silver; but, bad as they are, I pass round the best of them, to show that the process is practicable, if not very practical.

I hope I have made it clear that persulphate of ammonia has put a new power into the hands of photographers. The golden rule, to expose for the shadows and let the high lights take care of themselves, can now be carried out to the utmost limit without misgiving.

A whitewashed cottage in full sunlight, framed in dense foliage, need not be passed by, development may be pushed to any extent to secure detail in an under-exposed foreground, and printable clouds can be recovered from the densest sky.

In portraiture, likewise, the modelling of features lost in density can be reclaimed, and the folds of a white dress will reappear. Old negatives, put aside as hopelessly hard, will now again see the light, and will be transformed by this wonder-working reducer into satisfactory printers.

DR. H. SCOTT LAUDER.

### A LAZY-TONGS SHUTTER.

SOME few years past I constructed a shutter in which the peculiar action of the "lazy tongs" or compound lever was availed of, and, as a description of this shutter may be interesting, I offer it for the consideration of those who are looking for a shutter on the "slot before the plate" principle which will act quickly and easily. No other contrivance I know of is capable of so quickly and easily passing a slot across the plate. I assume that this action of the lazy tongs is well understood, so that, bearing in mind that the two short ends of the primary levers have only a short distance to travel in order to carry the terminal end a very much greater distance, and as the opening or closing of this short end can be done in the mere closing of finger and thumb, while the terminal end may have travelled some six or eight inches, the speed of the slot across the plate becomes evident, but, if instead of imparting the primary motion by thumb and finger a spring be used, the speed is greatly increased.

In applying this lazy tongs I make two systems of levers, each attached to a flexible screen in front of the plate, and with a slot—adjustable—between the two. One of the systems—that on the side the slot is to start travelling from across the plate is in its closed-up condition, the other system, that in the part of the screen covering the plate, being in its open or extended condition, it is evident that on opening the short ends of the levers on the closed system the slot will be projected across the plate, and the extended system closed up, or this action might have been reversed, the extended system closed by pressing together the short ends of the initial levers.

During the closing or extending of these systems of levers, the blind itself is wound or unwound on a receiving roller, actuated by the same initial opening or closing of the primary short levers.

J. V. ROBINSON.



## TWO NEW POINTS IN COPYRIGHT LAW.

In the case of *Baschet v. the London Illustrated Standard Company, Limited*, and others, which was heard by Mr. Justice Kekewich on November 8, counsel for the defendants raised two points of interest, at least one of which, it was stated, had never been the subject of judicial opinion.

The action was to recover penalties and damages for the infringement by the defendants of the plaintiff's copyright in five photographs which had been duly registered in France (the country of origin), and in respect of which he was therefore, under the Berne Convention, entitled also to copyright in this country.

The liability of the *Standard Company*, who were the publishers of the paper containing the unauthorised copies, in both penalties and damages was not disputed; but it was urged on behalf of the printers, who were stated to have acted innocently, that they were not liable to penalties, as they were merely the agents or servants of the publishers, and only printed what was sent them to print. Section 6 of the Act of 1862, it was pointed out, subjected to penalties any person who should, without the consent of the proprietor, "cause or procure" any copyright work to be repeated, copied, or otherwise multiplied for sale; and it was urged that, upon the true construction of these words, the person causing or procuring the copies to be made was the only person liable, and that his agents or servants, by whom they were actually made, were exempt.

But the Judge held that the argument failed. The printers, he said, were liable to penalties under the earlier words of the same Section as having, in fact, themselves repeated, copied, or otherwise multiplied for sale copies of the plaintiff's copyright photographs without his consent; and he pointed out that this part of the Section did not require proof of guilty knowledge, although such proof was necessary before similar penalties could be inflicted upon importers, sellers, or distributors.

The second point arose on the construction of sub-section 3 of Section 2 of the International Copyright Act (1886), which was passed to enable the draft Convention agreed to at Berne the previous year to be carried into effect. That sub-section provides that the International Copyright Acts, 1844 to 1886, and any Order in Council thereunder shall not confer on any person "any greater right" or longer term of copyright in any work than that enjoyed in the country of origin. Under the English law infringers are liable to, amongst other things, a penalty not exceeding 10% in respect of every unauthorised copy; and it has been held that, where the infringement has been proved, a penalty must be inflicted in respect of each such copy, and not merely a lump sum in respect of the whole matter. But evidence was given that, according to French law, the penalty for infringement ranged from 25 to 2000 francs in respect of each photograph, however many counterfeit copies might have been made, and it was urged that the plaintiff, not having "any greater right" in this country than he had in France, was not entitled to recover judgement here for greater penalties than he would have obtained in France. As it was admitted that 100,000 copies in all had been made of the plaintiff's five photographs, the difference in the maximum penalties was that between 1,000,000% here and 10,000 francs (say 400%) in France.

But again the defendant's contention failed. The Judge ruled that the words referred to related only to the nature and extent of the copyright and not at all to the remedies for its infringement. He thought it would be absurd to suppose there were no remedies for infringements anywhere other than the equivalents of those in force in the country of origin. It was impossible to work two systems of jurisprudence together in that way; the municipal laws and procedure of the two countries were entirely different. The plaintiff, having proved his case, was entitled to judgment according to the English law for penalties, damages, an injunction and costs.

## CLOUD PHOTOGRAPHY.

At a meeting of the Leeds Camera Club, on Wednesday evening, November 8, "Clouds and Cloud Photography" was the subject of a lecture by Mr. T. Morley Brook, the President of the Manchester Amateur Photographic Society.

The lecturer drew attention to the fact that all painters of eminence recognised the sky as one of the most important parts of their picture, a very material aid to the composition, and one which, if neglected or badly represented, would spoil the harmony of the whole. Not only was this true in painting, but even more so in photographic work, and there were few, if any, landscapes or seascapes which would not be improved by the addition of clouds. It did not always follow that, even if they succeeded in getting a cloud on the same negative as their foreground, it was suitable or in harmony, for the lighting must be suitable to the subject as well as the shape of the clouds to the composition. Beginners and photographers generally found this one of their great difficulties. It was a process which needed care, patience, and perseverance, but, when it was obtained, the difference between the so-called bald-headed print and the one with a properly printed cloud was remarkable.

Mr. Morley Brook dealt with the action of the light on the negative, showing why clouds could not very often be obtained on the same plate, and showed, when really it was desirable, how the difficulties might be

overcome by shielding back the light from that part coming from the sky. The next remedy, and generally the best, was to block out the sky *in toto*, and from another cloud negative print in one suitable. He strongly advised the members to lay in a good selection of cloud negatives, lighted from each side as well as from the back, sunrise, and sunset effects, and not to depend on one bought cloud negative for every picture.

The plate to use and the methods of development were dealt with, and he showed that, while ordinary plates might do for many subjects, yet for those in which colour predominated an isochromatic plate with a pale yellow screen was the best. It was wrong to tilt the camera upwards; let it be horizontal, obtaining a small part of the foreground, which should be focussed sharp in the distance. Development should be weak in pyro, or whatever reducing agent was used. Softness and delicacy, rather than harshness, should be aimed at, not only from the point of ease in subsequent printing, but also from that of pictorial effect. Following on to the actual printing, both for silver, platinotype, and bromide work, many useful hints and dodges were explained, the result of much experience and careful study.

In conclusion, the lecturer recommended his audience to never lose the opportunity of acquiring a good cloud, for, if they were in earnest, and meant to do anything better than "the usual thing," they would at some time or other find a good use for such effects.

A series of photographs, both direct and enlarged, illustrating the lecture, was passed round for inspection, the striking differences and the beauties of the finished work, as seen with its cloud effect, as against the bare print with its white sky, being very much appreciated.

## ON SHUTTERS.

[From the *Photo-Gazette*.]

The perfect shutter should combine certain qualities which many photographers do not even trouble themselves to study. Its principal quality is not so much, as many believe, its rapidity as the way in which the exposure is distributed. It might be supposed that, if the lens is quickly uncovered and quickly closed, the conditions which constitute a good instrument are fulfilled. But this is a hypothetical state of things, and the efficiency of the shutter is a practical question. The ideal shutter permits the lens to be fully uncovered during the entire exposure, and occupies no time at all in opening and closing, a utopian condition of things which is incapable of realisation in practice. Before discussing whether it is a condition of things to which we can approximate, it may be well to notice the different systems of constructing shutters in vogue in commerce. These may be divided into two classes: (1) shutters placed close to the lens (we shall see later which is the best position in this case); (2) shutters placed directly in front of the plate.

Shutters of the first class can be subdivided thus:—

- A. Shutters with circular movement.
- B. Shutters with glass.

In shutters having a circular movement it is necessary to distinguish between the lateral aperture and the circular aperture. The lateral aperture is arranged in an opaque disc, which rotates around an axis; if this point of rotation is at an infinite distance from the aperture, the drop-shutter pattern is the result. This pattern can be made by a board falling by its own weight, or accelerated by a spring, or by a roll of opaque material unwound from one roller and wound on to another, a form which can be made very compactly.

Whatever may be the arrangement, however, the opening should be of rectangular form, with its greatest dimensions in the line of fall. A square opening, with its side equal to the diameter of the opening, gives an exceedingly low efficiency. The time of exposure may be divided into three parts: (1) Poor image formed at the commencement of exposure by the edges only of the lens; (2) good image, during full aperture; (3) poor image, from this second point up to the end of the exposure, the image being again formed by the edges of the lens. Now, if the square is of the size of the opening, it is evident that the second exposure would be much too short in relation to the sum of the other two. On the other hand, by making the aperture oblong, the period of full aperture is prolonged. The drop-shutter form is one of the best and simplest yet designed.

When exposure is obtained by means of a plate bearing an aperture and pivoted on an axis, this opening ought to assume a sector form in order to equalise the time of exposure over the whole opening, and for the reason stated above it is necessary that the two radii bounding the sector be separated by a distance greater than the diameter of the opening to be uncovered.

The central opening is obtained by several plates moving in opposite directions, either pivoted around an axis or attached to two shutters moving in contrary directions; or, lastly, by a movement after the manner of the iris diaphragm. By these devices the centre of the objective is uncovered first and remains open longer than the edges. In the most perfect forms of shutter a special adjustment is provided whereby to considerably increase the time during which the shutter is completely open in relation to the time occupied in opening and closing.



B. Flap shutters are especially used for landscape and portrait work, since it is possible to give the foreground a longer exposure than the sky, and to thus obtain clouds and landscape on the same plate. This is a very positive advantage, but shutters of this class cannot compare with those of circular movement in point of rapidity.

The best place for a shutter depends on what it has to do; it may go immediately in front or behind the plate, or close to the diaphragm between the lenses; but its position is not to be chosen without reason. A "drop" pattern shutter may be placed anywhere, but a shutter, opening and closing from the centre, must be placed close to the diaphragm. Were it placed in front or behind the lens, the centre of the plate would receive much more light than the edges, and the defect, already very common amongst objectives, would thus be increased, whilst, if placed against the diaphragm, and preferably just behind it, the gradual access to and removal from the plate of the light is uniform.

The centre of the lens is the most suitable place in all cases when very short exposure is to be made, since, the space to be covered and uncovered being smaller, the movements can be made more rapidly. While the occasions on which extreme rapidity is necessary are rare, shutters which can be depended upon to give it are rarer still, and for such high speeds an anastigmat of the best make is necessary. In view of the fact that the best anastigmats are most delicately mounted, and that few firms, except lens-makers, can be trusted to exactly center a lens on a shutter, it seems best, for special subjects, to retain the mounting of the lens, and to place the shutter either in front of or behind the lens. By placing it behind, there is the advantage of one shutter serving several lenses. As a general rule, it will be found best to keep the lens intact, and to use a drop shutter of some form either in front or behind the lens. This will answer all ordinary purposes, such as landscapes, portraits, street scenes, and others where no higher rapidity than  $\frac{1}{100}$  of a second is required. In special cases,  $\frac{1}{100}$  to  $\frac{1}{1000}$  of a second, the use of a shutter opening and closing from the centre is necessary, and, as this is generally used for serious work, the element of price is of secondary importance. There is still to be mentioned the glass shutter, which uncovers the lower part of the lens first, gradually rising and falling back, a form the special quality of which recommends it for landscape work, owing to its giving more exposure to foreground than to sky.

Shutters placed directly in front of the sensitive plate are of great speed, giving exposures down to  $\frac{1}{1000}$  of a second. They are usually made with a blind carrying a slit which, in its passage across the plate, successively exposes horizontal sections. The objection to this form of a shutter, that all the parts of the image are not obtained at the same instant, is purely theoretical, for the speed of the shutter is much greater than that of the object.

It will have been seen from the above that the best shutter does not exist. None is absolutely best, for each in its place has advantages over others.

For the greatest speeds, the focal plane or diaphragmatic shutters; for less rapid exposures (animals or portraits in the studio), a shutter preferably fixed behind the lens; for general work, where equality of illumination is required rather than great rapidity, a drop shutter.

COMTE D'ASSCHE.

#### PHOTOGRAPHY FOR ARTISTS.

ARTISTS are usually great abusers of photography; they do not, as a rule, consider it an art, but as a poor mechanical process, giving, not a picture, but a dead-alive representation of an object. "A portrait done by means of photography," I heard an artist say some short time since, "does not truthfully represent the sitter. It appears as though it was carved in stone, and there is not an animated expression about it to show that it was alive. If there is a smile, it is a set 'plaster of Paris' one."

This I do not think is correct. I consider that a photograph is an exact reproduction of the expression and pose of the sitter (providing too short a focus lens is not used). The lights and shades may be slightly exaggerated, as the plate has yet to be invented that will allow of a correct exposure being given the shadows without over-exposing the high lights. A painting cannot possibly correctly reproduce the expression of a person's face, no matter how clever the artist, as it must be constantly changing during the tedious sittings.

I do not wish to discuss whether photography is an art, for it has been thoroughly thrashed out before. Certain it is, many pictures have been made—as the walls of the Salon and Royal Photographic Society will testify—that could not be equalled by many artists of repute.

Photography is a very great aid to an artist, whether he be a "pot-boiler" or a Royal Academician. It enables him to make a thorough study of the different phases of any one subject. Suppose, for instance, one came across some beautifully lighted clouds: a snap-shot could be taken of these at the instant the best effect was seen, before it had time to change. In sketching them they would have considerably altered before the sketch was complete, and the beautiful delicate lights and shades lost. Clouds in a landscape are very often the making of the picture; and all kinds of clouds—stormy, sunset, and sunny—could easily be studied by means of a snap-shot camera. Again, many an idea for figure studies can be picked up in the streets by aid of a camera.

In studying animals no doubt the camera will be of the greatest use, as they are very hard to paint on account of their ever-changing attitudes. By photography being of use to the artist, I do not mean that they should take the photographs and then copy them in colours. There would be no art in this. What I mean is, that the photographs are to give ideas and catch expressions which it would be impossible to do by means of sketching. Perhaps out of each photograph there would not be more than a quarter of an inch square that could be utilised, but it would all help.

The perspective of photography is not the same as the artist's. No matter how long the focus of the lens is, the foreground will be larger, and the distance smaller, than an artist would paint them. Sometimes it is possible to come across a view that has a very picturesque composition, but contains several blemishes—such as a tree or other part—that would form a more pleasing picture if removed. If this view was photographed, it would be of great use, as the artist could remove all ugly parts, and introduce figures or other objects to render it more artistic.

For artists whose speciality is painting war scenes, photographs taken on the battlefield would considerably aid them in getting the pictures true, as they would correctly reproduce the scenery, the positions of the men, and, above all, the different expressions of the wounded and dying. Paintings of battle scenes have mostly to be imagined rather than painted from the actual scene, for it would be very risky setting up a canvas and painting during the excitement and din.

Photography, perhaps, is the most useful in assisting that class of artist known as the "pot-boiler." It enables him, after he has drawn in the outline of the portrait or view, to paint in the detail without troubling the sitter to stay any longer, or sitting out in the cold or heat to paint the view from nature. The result will contain more detail, and will be quite as good, if not better, than it would had it been painted straight away without the assistance of a photograph.

Some artists will not use a photograph to paint from at all, as they have the idea that it will spoil their originality, and make them rely on other persons' work, instead of working out ideas for themselves.

An artist usually composes a picture from several sketches. Why should he not make it from several photographs? They would supply a lot more detail than sketches, and would be easier and more rapidly executed. If the artist is a specialist in any particular kind of work—architecture or marine, for instance—photography would greatly assist him in their study. If he came across a yacht or brig, the build of which he greatly admired, what would be easier than to take a snap-shot of it?

Artists will also find the camera useful in recording the types of different races they meet with when travelling abroad.

If artists only recognised the usefulness of photography, we should see them all in possession of a camera.

OSBOEN THORNBERRY.

#### THE ECONOMICS OF PHOTOGRAPHIC PRICES.

THE term economic in its ordinary meaning is not strictly applicable to the selling price of photographs and works of art generally, inasmuch as the market value of these articles depends largely on considerations to which it is impossible to assign any stable money value; at the same time, there is also a proper economy of those qualities which fix the price between good and bad photographs, and with these I shall attempt to deal.

The foundation principle of the economics of trading is that there cannot be, in one market, two prices for the same article, this being what is called the law of "level prices." On the slightest acquaintance with the photographic market, we find existing, side by side, many different prices for work which is to all appearances the same; this state manifestly contradicting the first rule of all trading. The contradiction is only apparent, for, if the articles were identical to the purchaser, then, according to the law of level prices, competition must bring down the rate of the dearer. The drop does not occur, since we are aware that in every town are photographers who continue to command high prices, oftentimes double the rate of others in the town with whom they are competing, and, obviously, the high prices could not be maintained if the articles sold were all of equal value in the public mind. In spite, then, of the fact that one cabinet in size and material is very much like another, level prices do not obtain in photography; but, on the contrary, a scale of charges from high to low. We may deduce from this that it cannot be competition which decides the price of photographs, but some special property residing in the works of the individual photographer.

In general trade this individuality is not very marked, and prices come to a level because they are determined by competition and cost of production—i.e., wages, material. In photography, other factors come in. Certainly the price of work is regulated to an extent by cost of production, though not to a great amount. In this respect photography is like art. We must allow that a "pot-boiler" requires as much paint, canvas, and labour to produce as the work of a master, yet the one sells for 5*l.* and the other for 500*l.* So with the photograph: plainly indicating that cost of production does not settle the price.

Competition, again, is the main power in determining the price of things which every one can be taught to produce, such as hand



cameras, drop shutters, dark-room lamps, the value of these being decided by the number existing, with the cost in time and material to produce them. When, however, we come to the making of a good photograph which many cannot be taught to do, and only a comparatively few can do with success, the price is of necessity regulated by the number of capable men, and the amount they produce. Thus, when only a few men have sufficient skill to make a certain class of photograph, these few may fix the price in a quite arbitrary manner. Competition and cost of production, need not enter largely, if at all, into their operations.

The conclusion we are driven to accept is that the value of every photograph is not controlled either by cost of production or competition amongst the producers, but by some more remote and elusive feature. We all know a superior from an inferior photograph, and though easily distinguished, it is not a simple matter to analyse and lay down in what consists those superior qualities, which even the public recognise, since they readily pay high prices for photographs which possess them. It may be accepted without doubt that the higher the quality of work the larger the price it will command, hence a complete analysis of the quality of a photograph will reveal the secret of its worth.

The merits of a photograph are decided by its technical excellence, æsthetic qualities, and artistic conception.

The Technical excellence is perhaps fifty per cent. in settling the selling price of the photograph, because slovenly and careless manipulation detracts from the worth of manufactures of every kind. The importance of good technique is somewhat overlooked by the rising photographic generation, and it is not striven after with that persistency characteristic of an earlier time. This arises partly from a conviction that artistic and æsthetic qualities take a higher place than mere mechanical work, and partly from the lack of assistants capable of doing what is required. With regard to the latter, the professional man cannot secure assistants of ability merely for the asking, nor by offering a large wage: for they must first be trained.

Photographers make the grave mistake of regarding the training of assistants as outside their province, whereas it is solely an employer's question, because it is so intimately related to prices, and consequently profits. Employers also pay too little attention to the social status of those they select as apprentices and assistants. To make a good photographer, a lad must come from a station above the working classes, for undoubtedly the middle and upper classes supply the best photographers. In my opinion, prices will not reach the high-water mark until both employer and employed are drawn from the cultured.

Good technique being assured, the æsthetic qualities affect the money value of the work. These it will be sufficient for me to enumerate, without entering into any discussion of their nature or the reason of their value. The premier position must be given to the style, that stamp which makes a man's work stand out from that around him, and yet is in such good taste as not to constitute eccentricity. The work of all photographers who have made a reputation and commercial success is marked in this way so plainly that their unnamed productions may be picked out from amongst a selection of other workers.

Allied to this feature of style is that of originality, a trait that must exist in all good work. It should not be overdone, and be skillfully employed to suit the public taste, yet, without some trace of originality, it is scarcely possible to command the highest prices.

Lastly, there is distinction. A photograph may possess style and originality, and, at the same time, be a failure for want of any signs of superiority, lacking that air of distinction which gives to the best productions the character of being things apart, unique and rare.

Next to style, originality, and distinction, come the purely artistic qualities which enter as factors in determining price. The arrangement of every photograph must observe those rules of composition, balance, proportion and lighting recognised by the general intelligence of artists as constituting the laws of art—these in practice meaning that the work shall not offend against good taste, the sense of beauty, the knowledge of true form acquired by persons of average culture. To specify or illustrate these rules of art is not my purpose; sufficient for me to indicate them as influences that control the money values in the photographic market.

Besides the technical, æsthetic, and artistic merits that increase the value of a work, there are also several outside factors which have a pronounced effect on prices. The foremost of these is fashion. To obtain the attention of the fashionable world will alone give a high value to work which, when the craze is past, falls back to its normal place. So powerful is the support of fashion that it may safely be said the man who succeeds in attracting it, and properly manipulating the market he has thus created, may raise his prices to a height that puts all questions of competition and the laws of markets entirely on one side.

Connected with the voice of fashion is the consideration of the photograph as a luxury. Any picture, great or small, to command a fancy price, a luxurious price, must be a luxury, having a rich and valuable appearance, a look of wealth, of richness—a thing it is a pleasure to possess. Photographs of this nature can never be cheap, nor common; never be made for the multitude; but must remain as luxuries, and be purchased at high rates.

To recapitulate, it has been advanced that photographic prices are not finally adjusted by competition nor cost of production, but by the skill,

the æsthetic and artistic merits displayed in the photographs; their more or less luxurious appearance, and the trend of fashion also having great influence. It follows from these conclusions that there is scarcely a limit to the price that might be paid for a photograph, because there is no limit to the possible æsthetic and artistic qualities it may display; no finality to the power of fashion, and the price its votaries would pay for a luxury. Even to the ordinary purchaser one excellent work at a guinea is valued more than any number of indifferent ones at 1s. or 2s. each; and this fact alone indicates that quality is the real measure of photographic value.

Quality being what fixes the price of work, it is evident that, when employers are wanting in culture, and assistants without skill, prices will be low, and as these become greater in each class, so prices will have a tendency to rise with the increasing luxuriousness of their productions. The settlement of prices is thus largely in the photographer's own hands, and he is not to any vital extent a victim of competition nor of circumstances over which he has no control. When prices show a tendency to fall, the only remedy is to improve the quality of work, on the technical, æsthetic, and artistic sides, and recent events amongst professionals could be brought forward to support this contention.

Finally, it must be recognised that, if work is entirely lacking in all the above æsthetic and artistic qualities, does not appeal to fashion, and is utilitarian and not luxurious, its price will be fixed by the ordinary market laws of competition and cost of production. A large proportion of photographic work is of this description, and, of necessity, its price is beyond the control of the producer. He must accept the usual market rate for his wares, or give place to a rival. He possesses but little voice in the matter, for the purchaser has the main control. In such cases the remedy is combination amongst the producers against the purchaser, the former agreeing not to supply the latter below a rate much above the competition level. Combinations, however, are generally too weak to stand the strain of the fierce competition of modern markets.

JOHN A. RANDALL.

#### LARGE NICOL PRISMS.

MR. C. D. AHRENS gives in *Nature* the following particulars of some of the larger Nicol prisms which he has made from blocks of Iceland spar within the last thirty years:—

"(1) In 1873 Dr. Spottiswoode bought a very fine block of spar from Mr. Tulinus, of Copenhagen, who then owned and worked the spar quarry at Eskiförðr in Iceland. Out of this, which was absolutely flawless, I made a Nicol prism having a clear field of  $3\frac{3}{4}$  inches diameter, the length of each side being 12 inches.

"(2) In 1874 I made a second prism from the same block of spar just mentioned, and also a third from another piece of spar bought by Dr. Spottiswoode. Both of these prisms had a clear field of  $3\frac{1}{2}$  inches, the length of the sides being  $11\frac{1}{2}$  inches. These are now at the Royal Institution.

"(3) In 1875 I made a Nicol prism for Mr. Frank Crisp, of  $3\frac{1}{2}$  inches field and  $11\frac{1}{2}$  inches in length, which he used in a polariscope in conjunction with the first one mentioned above, which he had acquired from Dr. Spottiswoode. These Mr. Crisp sold, and are now in England.

"(4) In 1876 I made two more large prisms for Dr. Spottiswoode, one of 3-inch and the other of  $2\frac{1}{2}$ -inch field, as spar was even then beginning to get scarce. These are now at the Royal Institution.

"In all these prisms the end faces were the natural crystal faces, only smoothed and polished, and the plane of section made an angle of  $87^{\circ} 30'$  with them, or  $21^{\circ} 30'$  with the length-axis of the prism.

"In none of them was Canada balsam used as the cement (I have not used it for this purpose for thirty years past), but a special material."

#### A NEW AMERICAN CAMERA COMBINATION.

ACCORDING to the *Rochester Union and Advertiser*, within a few weeks all the large camera manufacturers in Rochester, N.Y., will be united in one company, with a capital of \$3,500,000. Options on all of the plants in the city have been obtained, and experts are now at work examining the books of the various concerns.

Rochester stands at the head of the list as a camera-manufacturing city. All during the hard times, when other industries were suffering more or less and hardly any branch of manufactory was profitable, the camera companies of this city were working full time and making money. The industry is one of the most important in the city, employing many thousands of hands, and circulating weekly thousands upon thousands of dollars. The combination of the various manufactories will greatly decrease the cost of manufacture and marketing, while not decreasing the number of hands employed or the amount of money paid out in wages. It is in every way desirable, and when consummated will greatly enhance the city's mercantile and manufacturing reputation.

The officers of the new company will be made up from the officers of the concerns that are taken into the consolidation, and the board of directors will contain the names of some of the most prominent capitalists of the city, who will be active in its management.

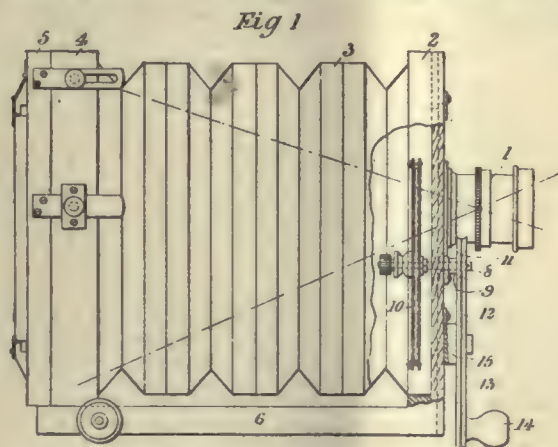


# PHOTOGRAPHY IN NATURAL COLOURS—MR. FRIESE-GREENE'S SYSTEM.

MR. FRIESE-GREENE has patented some improvements in taking and in projecting photographic images, in means therefor, and in photographic negatives, the primary object of which is to produce photographic negatives containing vibrations of the various colours existing in the original scene or picture (in other words, negatives containing these various colours in a latent state), and to reproduce the scene or picture from the negative upon a screen or the like in the natural colours.

We append the patentee's description, taken from his complete specification:—

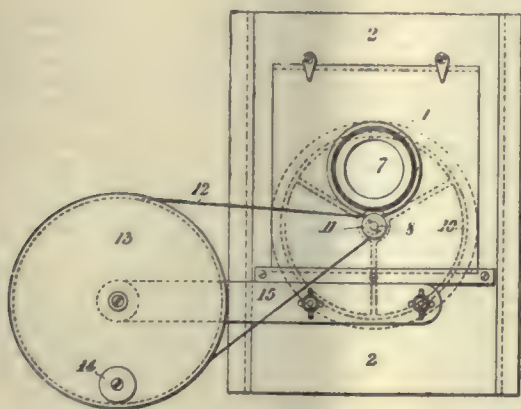
"A photographic negative of a scene or picture is taken by means of a



camera or photographic apparatus through a transparent material or medium bearing three or more primary colours. The negatives thus obtained will contain vibrations, not only of the several colours employed, but also of all the varieties of colour caused by the blending of these colours. Then by obtaining a transparency in the usual way from this negative, and projecting the image from the transparency upon a screen by means of a magic lantern or projecting apparatus through a transparent medium coloured and constituted similarly to the transparent medium employed in taking the negative, the image appearing on the screen will show all the colours of the original scene or picture. The invention allows of taking and of projecting animated or changing scenes, as well as scenes of stationary objects.

"The transparent medium which I prefer to employ consists of a disc

Fig. 2



of glass or suitable material composed of differently coloured sectors. In taking a photographic negative, or in projecting a transparency obtained from such negative, this disc is caused to revolve rapidly in front of or behind the ordinary lens of the taking or projecting apparatus, or between the lenses when more than one lens is employed, the several coloured parts of the disc moving successively past the lens during one and the same exposure.

"I may also employ, instead of the revolving disc, a band or strip of suitable transparent material bearing the three or more primary colours in regular repeated succession, caused to travel rapidly in front of or behind the lens; or I may construct the coloured disc above referred to in the form of a lens composed of differently coloured lens sectors having a common focus. In this last case, the lens is used alone and in place of the ordinary taking or projecting lens.

"By these means I obtain a single negative or transparency instead of the three negatives or transparencies hitherto required in colour photography.

"In Figs. 1 and 2 the photographic camera shown is constructed in substantially the usual manner, and comprises the objective piece 1, front 2, bellows 3, rear part 4, and back 5, mounted on the base 6. 7 is the objective, consisting in this arrangement of an ordinary lens. A horizontal axle 8 carried in a bearing bracket 9, fixed to the camera front 2, extends through the latter into the interior of the camera, where

Fig. 4

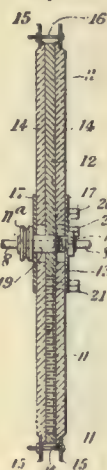
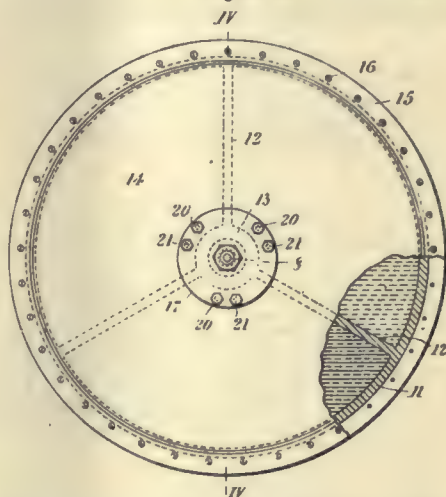


Fig. 3



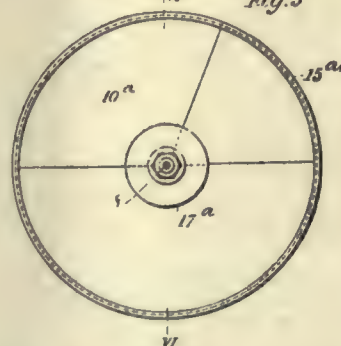
it is provided with a rotary disc 10, constructed as hereinafter described, and arranged to be rotated rapidly behind the objective. The rotary motion can be imparted to the disc 10 in any suitable manner. In the particular arrangement shown there is fixed upon the outer end of the axle 8 a small cord pulley 11, which is driven by means of a cord 12 from a considerably larger cord pulley 13, rotated by hand by means of the handle 14. The pulley 13 is carried by a projecting part 15 fixed to the camera front 2. The aforesaid disc 10, which is shown more fully in Figs. 3 and 4, consists of a rubber ring 11, formed with three radial strips 12 and a central boss 13, and which is adapted to be clamped fluid-tight between two circular plates 14, 14 of colourless glass or other transparent material by means of two peripheral flanges 15, 15, through which pass a number of tightening screws 16. A fluid-tight joint at the boss 13 of the rubber ring is further ensured by means of two plates 17, 17, which are clamped against the outsides of the glass plates 14, 14 by means of a nut 18 screwing on a hollow bolt 19 formed with a head 11. Rotary motion is imparted from the cord pulley 11 through the axle 8 by keying the bolt head 11 on the axle 8. The bolt head 11 is preferably formed as a cord pulley as shown, so that when it is desired to arrange the disc 10 in front of the objective, the said disc can be driven directly from the cord pulley 13 by means of the cord 12 passing around the grooved bolt head 11.

"The space comprised between the ring 11, its boss 13, and the glass

Fig. 6



Fig. 5

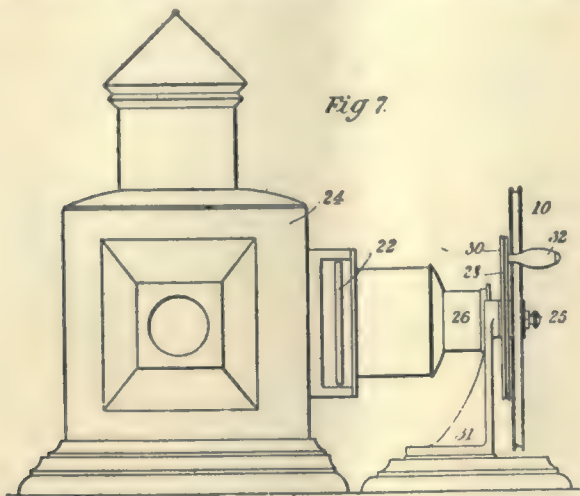


plates 14, 14 is divided by the three radial strips 12 into three compartments of sector shape, which are filled respectively with liquids of separate colours, preferably blue, green, and red, but other colours may be adopted, as, for example, blue, red, and yellow. Each compartment can be filled through a hole normally closed by a plug 20, the air displaced by the liquid escaping through a hole normally closed by a



plug 21. The actinic effect of the exposure of the colours can be varied by varying the intensities of the colours.

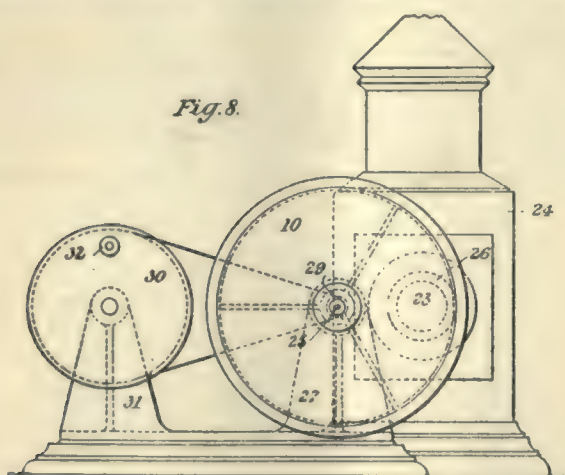
"Instead of making the three sectors containing the three differently coloured liquids of equal area, and varying the actinic effect of the exposure of the colours by varying their intensities, I may employ liquids of uniform intensity of colour, and vary the exposure by varying the areas of the sectors. In such case the green sector should have about half the area of the red sector, and the blue sector be very much smaller than the green. The proportions will depend to some extent upon the particular kind of sensitive film employed, but they will be chiefly regulated according to the length of exposure required for photographing the several colours, an important point being that all the colours shall have



an equivalent amount of exposure, having regard to the fact that blue requires much less exposure than green, and green less exposure than red.

"Also instead of employing the disc 10 containing the liquids as above described, I may employ the disc 10<sup>a</sup>, shown in figs. 5 and 6. This disc is composed of three differently coloured sectors of single thicknesses of glass or other transparent material fitted in a peripheral ring or bezel 15<sup>a</sup>, and clamped between two plates 17<sup>a</sup>, 17<sup>a</sup>, and fixed upon the axle 8 in the manner above described with reference to the disc 10. In this arrangement the sectors are made of different areas corresponding to the requisite exposures of the respective colours.

"In taking a photograph, the disc 10 (or the disc 10<sup>a</sup>, as the case may



be), is caused to revolve rapidly by turning the handle 14, so that the several coloured parts of the disc will pass successively behind the objective 7 during one and the same exposure.

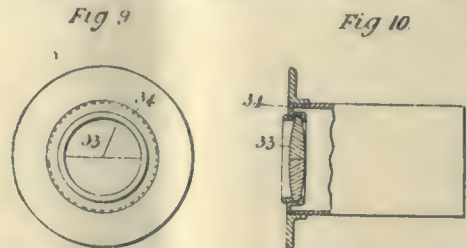
"In projecting the image upon a screen the transparency 22, obtained from the negative (see fig. 7) of the photograph taken by means of the apparatus hereinbefore described, is projected through the lens 23 of a magic lantern 24, in which a disc 10, composed of sectors similarly coloured to those of the disc 10 used in taking the photograph, is revolved rapidly in front of the lens 23. The picture appearing on the screen will show all the colours of the original scene or picture.

"The disc 10 can be rotated by any suitable arrangement; in the arrangement shown it is mounted on a horizontal axle 25, supported

laterally of the lens piece 26 in a bracket 27. Rapid rotary motion is imparted to the disc 10 by means of a cord 28 passing around a small cord pulley 29, keyed on the axle 25, and around a large cord pulley 30, carried by a bracket 31, and provided with an operating handle 32.

"The coloured disc 10<sup>a</sup>, shown in figs. 5 and 6, may also be constructed as a lens, by dispensing with the central attachments, and the sectors being curved to a common centre. This lens, which does not rotate, is employed alone in place of the ordinary lens in both the camera or photographic apparatus and the magic lantern or projecting apparatus.

"In figs. 9 and 10, which illustrate this parti-coloured lens, 33 represents the lens; it is composed of three lens sectors having one common centre, arranged in a suitably constructed holder 34. These lens sectors are coloured in separate colours, and the respective sizes of the sectors correspond to their respective colours as hereinbefore explained. The



negative images produced by the several sectors will be, as it were, intermingled with one another to form one single negative image containing vibrations of the several colours. This image, when transferred to a transparency and projected upon a screen by means of an apparatus or lantern having a corresponding parti-coloured lens will reproduce the original scene or picture in its natural colours. For some purposes the lens sectors may have slightly different foci.

"If it is not required that the picture obtained should be coloured, I employ a lens composed of several uncoloured lens sectors having one common centre, and they should be of equal dimensions. The negative obtained bears, as is the case when coloured lens sectors are used, as many pictures as there are sectors, these pictures being, as it were, intermingled or superposed, the result being that the positive picture subsequently produced is softened, and 'retouching' becomes practically unnecessary."

#### CONCERNING LOCAL EXHIBITIONS.

SURELY nothing is more stimulating or educative than the holding of a reasonably representative exhibition of pictorial photography in the provincial centres.

This, at least, is the opinion formed while the glamour and memory of our own recent display is still fresh in the mind.

The stimulating effects have in our case taken many forms. In the first place, members who have hitherto been chiefly remarkable for their technical abilities have been induced to strive, in several instances with much success, to introduce special indications of grace, taste, emphasis, and selection into their prints, and have also been at the pains of learning what is the particular fashionable foible that is likely to tickle the eyes of those "Heavenly Triplets" who do the judging.

Quite an unrelated form of stimulation is the outcome of the demonstration of various processes which an exhibition affords opportunity for. In our own case a particular printing process, which is by no means a novel one, obtained a very considerable number of converts. One, a certain energetic professional, who had not previously used the paper in question, has since been employing it wholesale.

As for the educative influence, this is immense. First, there are the members. Take our own as an average sample of other societies. Out of some hundred and forty or so, I would wager that not a dozen have been to see the Exhibition lately open at the Salon, which, after all, may indicate great sanity. But what is to be said of the fact that not ten per cent. have been to the Royal? "True 'tis, 'tis pity; pity 'tis 'tis true" that three-fourths of our members never knew, until we opened our late Exhibition, that certain teachers in the great world of pictorial photography have discovered that eyes were given to us that we should not see clearly, and fine lenses bestowed upon us that we may avoid definition.

Then, there is the opportunity of reminding Judges, and others whom it may concern, that photography, stripped of her artistic domino and mask, is in many eyes quite as acceptable as when disguised in the brave attire of the painter-man.

*The Birth of a Snow Flower*, by Mrs. Main, is one case in point; *The White Cactus*, transparency, by Mr. Henry Stevens, is another instance; *An Old Oak Cabinet*, by Mr. G. W. Jenkins, is a third. All the foregoing are cited from our late Exhibition, and bear witness that perfect form, gradation, brilliancy, and almost infinite detail are waiting for the clever artist to conjure with.

Above all, such an exhibition teaches the member that *in medio tutissimus ibis*—that is to say, if he wants to make a creditable ap-



pearance on exhibition walls, and also stand well in with the medal winners.

After all, the best educative outcome of a local exhibition is that it teaches the local public that photography is a good deal more than is evidenced by show-case, by process block, or by the callow monstrosities which countless amateurs are constantly bringing out of their breast pockets for the admiration of much-loved acquaintances.

Of course, we of Croydon could not get "all the blood of all the Thomases;" but we managed, as I suppose any other local society might do if it chose, to bring together a sufficiently impressive collection to extort many expressions of admiration and of surprise from casual visitors, a considerable proportion of whom evidently had no idea of the lofty status which photography has of recent years attained. If it does nothing else, a well-arranged local show adds an often much-needed dignity, and lends seriousness to the practice of photography, whether as a vocation or as a recreation.

Nor is it to be forgotten—although this is, no doubt, a small matter—that a local photographic Exhibition is of considerable educative value to local art students and artists.

Some of these scan the prints for facts, others to familiarise themselves with the face of the surrounding country; not a few find amongst the landscape suggestions for subjects. This last is by no means a mere supposition, more than one painter having within the past week or two acknowledged to me their indebtedness to photographic exhibitions for finding the germs of successful painting.

Of course, one cannot have local exhibitions without medals, which are at times run down because, like many other good things, they have sometimes been put to bad uses. Why should the amateur work like a porter or a packhorse, and toil many a league picture hunting? why should he drudge through the long watches of the night, if, when success crowns his labours, he is to be put off with that convenient line from A. A. Proctor, "The striving is the prize?"

Anyhow, amateurs, and professionals too have, most of them, a consuming thirst for medals. And quite right too, for without such a hall mark of merit the exhibitor may, in the words of a Cookney poet, well exclaim, "E don't know where 'e are." I do not mean to infer that he will always be sure of his bearings by examination of the medalled pictures; but, at any rate, the worst marks will not often come to the top. Some people make much needless fun over medal-giving, calling medal-winners 'pot-minters,' and other unkind names. The aforesaid are, I fancy, mainly recruited from those who have tried to win medals and failed, or from those who have such a colossal reputation, all their "very own," that they fear to put it to the test by competing against the forward, pushful crowd. Let these objectors reflect that all artists simply love appreciation, and that they especially dote upon the medal.

Hear what says that great, precocious genius, whose brilliant beginning was cut short by death—I mean Marie Bashkirtseff: "If two years ago I had received an honorary mention, I should have fainted; if last year they (the Paris Salon) had given me a medal, I should have wept with joy."

The main objection to medals is that they entail judgments and, consequently, Judges. This objection raises up an almost interminable series of points to squabble over. First, who is to judge the Judges? How are they to be picked out, and by what sign shall they be known? No completely satisfactory answer is forthcoming. If you value experience of exhibitions and familiarity with most of the exhibition work, then it is only needful to look over the prospectuses of a few local exhibitions to enable a more or less suitable selection to be made. This done, there immediately arises the cry of "hark Judges!" A certain proportion of exhibitors whose work is regularly passed over by either of Messrs. A, B, C, D, E, and F, naturally long for fresh blood, and refuse to submit prints to the aforesaid. As for members, they will probably object to the board of Judges as leaning either too much to the art or too much to the technical side.

Another trouble which accompanies medals is the inducement held out to create classes which often have little or no legitimate *raison-d'être*, and are besides in many ways harmful. Thus, an exhibitor, if he takes, say, half a dozen landscapes under almost identical circumstances, may possibly find that he can indiscriminately enter six prints from the six negatives in as many classes, thus: (1) Landscapes, (2) Enlargements, (3) Hand camera, (4) Excursion, (5) Open, (6) Lantern Slides. Again, the undue multiplication of classes very materially interferes with the effective hanging of a gallery. It is impossible to group exhibits to their mutual advantage and with an eye to the formation of well-balanced arrangements if the collection has to be chopped up into a larger number of variously numerous classes.

No doubt in local exhibitions this lavish creation of classes helps to attract entries, and materially facilitates the bestowal of medals for poor work.

As far as members' classes are concerned, three divisions seem ample for prints, i.e., (i.), the figure; (ii.), other subjects; (iii.), technical and scientific, which last might include a good many intellectual photographers. To the above might well be added an open class for all subjects.

The Champion class is found to be somewhat of a delusion and a snare. A good deal of poor work which has been medalled by very easy-

going Judges, and some few respectable prints, which are "old stagers" as a rule, make up this class.

Naturally, people who have carried off distinguished awards, such as the Royal Photographic Society's medal, &c., do not care a rap about their picture gaining the first place at the Exhibition of the Green-cum-Feeble Photographic Society. On the other hand, they very much object to the bother and expense of packing, to the entry fees, and to the possible ignominy of their print being passed over.

In order to make the open class as attractive as possible, it seems to me that something should be done to get rid of the "hack" Judges. On the other hand, these amiable and, all said and done, generally thoroughly capable, gentlemen are almost a *sine-quâ-non* for judging members' works; for every one knows that the average member generally has his mind stuck full with suspicions of treason, as favouritism; hence he feels that any local man, if appointed Judge, would be biased by what he knows of the exhibitors.

What seems to me a very good compromise is to obtain the "hacks" to judge the members' classes, and elect a well qualified triumvirate of local lights to award the palm in the open classes. By this expedient, outside exhibitors would know that the medal-giving would not be in the nature of a foregone conclusion, as was the case with a certain picture which circulated for some weeks from one exhibition to another as did "the hacks."

The picture is said, under these circumstances, to have been invariably medalled. But one day this remarkable production was switched off into another circuit, in which entirely different sets of Judges ruled, with the result that the medal-winning immediately ceased.

I feel sure that, if this proposal were adopted in many cases, very much larger entries in the open classes would result. Exhibitors, who have been discouraged by the continued passing over of their prints on the part of the hack Judges, would welcome the chance of appealing to an entirely fresh jury of experts, which there are few towns or districts but could provide, especially if a local painter of repute is included, just to remind his photographic *confrères* that correct technique is not the only thing to bear in mind, and that, on the other hand, sham impressionism is not good art.

HECTOR MACLEAN.

#### BIRD PHOTOGRAPHY.

LET me say at once that, beyond photographing very young birds in nests, and some sparrows from my bed-room window with an ordinary camera, I have had no practical experience in bird photography. Therefore, on this account, perhaps, I possess no qualification to offer any words of advice on the subject. But I have had the pleasure of conversing, on several occasions, with one who, for several years past, has spent very many hours in pursuing what undoubtedly must be a peculiarly fascinating branch of photography, namely, Mr. R. B. Lodge, of Enfield, whose work in this direction is well known. And perhaps a few hints, although second-hand, may not be without interest to those who would take up the subject.

In the first place, he who would photograph birds in their haunts should be patience personified, and be able to put up with many inconveniences, such as standing up to your middle for hours in not particularly pleasant-smelling water—employing waders, of course. After spending the best part of a day in this way, you may have the pleasure of seeing your camera or dark slides containing your exposed plates slip into the water. You say nothing, that is if you have been brought up on Y.M.C.A. principles, but, like the parrot, you think a lot. Although you may be dying for a smoke, this is quite out of the question, because it would scare the birds away, and they are what you are endeavouring to photograph. And you mustn't make a noise, for this, naturally, would have a like effect. So you live, for the time, in a state of suspended animation. If you are careful and wait long enough, you may be able to make a few exposures, and, if the light has favoured you, the result may be satisfactory.

By this time it will perhaps be recognised that photographing birds in their haunts is not the easiest of photographic work. The agile little creatures do not allow the operator five minutes in which to focus and expose. Birds as a rule are busy creatures, they have not much time to spare to have their photographs taken, and the operator needs to be alert. The operation of focussing and exposing has to be accomplished almost momentarily, unless the bird be sitting on the nest, in which case it may be disposed to give the photographer an actual "sitting," according him ample time to perform the necessary preliminaries. If the seeker after bird photographs is commercially inclined, and most people are nowadays, he may be able to dispose of the right to reproduce the resultant prints to a magazine editor. Although the photographer may have spent the best part of a week in getting a decent negative, and spent no inconsiderable sum in railway expenses, &c., the said magazine editor may offer half-a-guinea for the use of the photograph. This offer may or may not be accepted. It would depend on the personality of the photographer and the value he put on his work.

Contrary to the opinion of many who could have never used a camera in their lives, bird photographs are not taken with the inevitable Kodak or with an ordinary stand camera, which would depict the birds a microscopical size. Specially designed apparatus is practically essential.



I have seen the various cameras that Mr. Lodge has employed for this work. His first camera and his most recent one possess little in common. Enthusiasm goes a long way, otherwise it would be difficult to explain how Mr. Lodge could tramp miles with the cumbersome and weighty arrangement which did duty when he first commenced this work. Every season his camera underwent some modification. Evolution has been at work, and now this photographer is the fortunate possessor of a camera which seems almost perfect for its purpose. A pony and trap is not necessary to cart it about, which would have been very desirable in the case of his initial camera. He does most work now with an aluminium mounted tele-photo lens fitted to a beautifully compact quarter-plate camera. By means of an eyepiece and a reflex arrangement he can follow the movements of the bird to which he is directing his attention, and, at the physiological moment, make the exposure. The whole is mounted on a piece of willow shaped like a gun stock, to which a single leg to ensure stability is attached. The fastest available plates are invariably used and development carried out with care. For nests an ordinary camera can, of course, be used.

J. A. REID.

### PORTRAITURE BY ARTIFICIAL LIGHT.

The first meeting of the session of the Glasgow Photographic Association was held in the Philosophical Society's Rooms on November 2. Office-bearers for the year were elected as follows:—*President*: Mr. J. Craig Annan.—*Vice-Presidents*: Messrs. J. C. Oliver and Robert Dodd.—*Council*: Messrs. J. E. Hanbidge, J. F. King, William Lang, F.C.S., W. J. McIlwrick, George Mason, A. Lindsay Miller, John Stuart, and Archibald Watson.—*Treasurer*: Mr. George Bell, 152, Sauchiehall-street.—*Secretary*: Mr. Charles Macdonald, 100, West Regent-street.

In the absence of the President, the chair was taken by Mr. John Stuart, the retiring President.

Mr. Stuart made some remarks about the objects of the Association, and urged that the opportunities afforded by it for discussion and mutual assistance should be more taken advantage of. Mr. Stuart then introduced Mr. A. G. Adamson, who addressed the meeting on "Portraiture by Artificial Light."

In the course of his remarks, Mr. Adamson emphasised the leading differences between lighting a figure by daylight and by artificial light. He was of opinion that these differences were so well defined, and, in the case of a reliable and constantly uniform source of light, so easily mastered, that he could never too strongly insist that the hesitation displayed by sections of the profession and amateurs to adopt artificial light, not as a makeshift in the studio, but as a reliable substitute for daylight, arose from fears as to difficulties in manipulation, which were perfectly groundless. The sole secret of success in portraiture by artificial light, as distinguished from daylight, was a very simple one, viz., the use of reflecting screens to a somewhat greater extent than was necessary in the diffused daylight usually used.

Mr. Adamson then went on to speak of the results of his experiments with the various forms of artificial light available. He had found the magnesium light the most valuable actinically, but this light was meantime barred by the impracticability of its proper manipulation. Electric light had been found to be practicable and satisfactory, being easy of control and use, but it involved expensive installation and supply, not always available, and its application was therefore limited. Owing to the scare amongst the insurance companies and their unreasonable attitude towards its use in any form, acetylene was presently almost out of the running. Having considered these, he had cast about for the light capable of universal application, and had turned his attention to ordinary coal gas. Owing to the presence of the yellow pigment in the human skin, the first thing to be done was to get rid of the useless yellow in the gas flame, and the next to devise a plan whereby the necessary quantity of light could be obtained for quick exposure without involving any special gas supply, and he explained how he had devised a coal-gas light so coloured as to be of the same actinic quality as the electric light, and how, having found the practicable light, he had contrived a portable apparatus for supplying it. "As the proof of the puddin' is the preenin' o' it," he then gave a demonstration of the new pressed gaslight apparatus, which his firm have just added to their list of artificial lights for photography. The operations were of a very interesting and successful character, several of the members present sitting to Mr. Adamson, who showed how easily and quickly the effects of light were to be got, and with an average exposure of five seconds produced negatives of bust, half length, and groups of excellent quality, which were developed and handed round for examination, the Chairman stating that these were as fine as he, for himself, should desire. The light carried perfectly over the groups, there being no falling away of brilliancy at the feet.

The lamp itself was very simple and neat, whilst the gas to feed a number of large special burners was obtained without any special supply, by taking out one of the ordinary burners from a gaselier in the centre of the room, and slipping the end of a length of rubber tube over the pipe. This tube led into a reservoir, controlled by a lever and special valve attached to the stand of the apparatus. When the lever was raised, the gas fed into the reservoir, filling it between each exposure, and at the same time keeping alight one of the burners in the reflector for the purpose of arranging the light and focussing. When the exposure was

about to be made, the other burners were lighted by simply turning on the gas to them. The members were very much impressed with the simplicity and effectiveness of the apparatus.

In the course of his demonstration, Mr. Adamson explained that the capacity of the reservoir being one cubic foot, and its being capable of being also used for acetylene gas, which could be manufactured and filled outside the studio, he had hopes of being able to get the insurance companies to modify their position as regards acetylene so as to allow of its being used in the apparatus, seeing that there could be no danger in dealing with so small and isolated a quantity. He also explained how the apparatus took to pieces for easy removal from house to house. The members who were photographed stated that they had not felt the light in any way trying on their eyes. The Chairman, in proposing a vote of thanks to Mr. Adamson for his very interesting demonstration, said that he thought the members would agree with him that this new light of Messrs. Adamson Bros. bore out all he had said, and was bound to have a big future before it, as it certainly had all the qualities claimed for it.

## Our Editorial Table.

### THE GOERZ LENSES: A NEW SERIES.

C. P. Goerz, 4 and 5, Holborn Circus, W.C.

A new series of the Goerz lens (the No. IIa) is being issued, and we here summarise its principal features. The lens is of symmetrical form, each component consisting of five glasses. The largest aperture is  $f/5.5$ , and a non-astigmatic flat field over an angle of  $70^\circ$  to  $75^\circ$  is covered. It is pointed out that each combination, although consisting of five component lenses, has but two free surfaces, and hence it is claimed that the loss of light by reflection is reduced to a minimum.

The single combinations form landscape lenses at the relatively high rapidity of  $f/11$ . They are claimed to be remarkably free from distortion, and are adapted for groups and large portraits. It is recommended that, when a moderate angle only is required, they may be used for architectural subjects with perfect results.

The Goerz anastigmats, Series IIa, are supplied in the following forms: (1) as symmetrical doublets, working at  $f/5.5$ ; (2) as single combinations, working at  $f/11$ ; (3) as sets of single combinations of different foci, forming a "convertible" series of three doublets, varying in rapidity from  $f/5.9$  to  $f/6.3$ .

A four-and-three-quarter-inch lens of the series, covering a quarter-plate, was submitted to us for our examination, the result of which justifies us in confirming the claims made on its behalf. Astigmatism and curvature of field are non-existent, and the lens is of a very high order of optical excellence indeed.

### CATALOGUE RECEIVED.

Newton & Co., 3, Fleet-street, E.C.

THE latest catalogue of Messrs. Newton has been brought down to date by the inclusion of sets of slides on subjects of current interest, such as the Transvaal and the War; Wireless Telegraphy; Birds and Animals, by R. B. Lodge; Spiders, Insects, and Butterflies; Canterbury, the City and Cathedral; China—Burma; Malay Archipelago; National and Tate Gallery; Belgium; Elements of Agriculture—Wheat and Cattle; St. Paul's Cathedral; The Thames; Flower Studies; Australia—Up Country; Meteorology; Astronomical Works in the Solar Physics Observatory; Lang's Fairy Tales; Alice through the Looking Glass; Stations of the Cross from Wood Carvings; Chinese Illustrations of Bible Stories. Attention is drawn to a telegraphic cypher which may be used when ordering any of Messrs. Newton's sets of slides.

### SPECIMENS OF TRADE PRINTING AND ENLARGING.

S. H. Fry, 12, South Villas, Camden-square, N.W.

WE are seldom made the recipients of such charming specimens of printing and enlarging work as those which have reached us this week from Mr. S. H. Fry, who seems, in an incredibly short space of time, to have placed himself in the front rank of his branch of the profession. Mr. Fry specially devotes himself to working for professional photographers, and one of his leading lines is the ever-popular carbon enlargement, while he also undertakes bromide, platinum, and contact surface work in all the pleasing varieties of style and colour which these processes nowadays admit of. Day and electric light are used in his studio, and a staff of expert artists is retained on the premises. It may be said that Mr. Fry is in a position to immediately cope with all the requirements of professional photographers in regard to printing and enlarging.

The specimens submitted to us are of exceptional interest and beauty. First we note a carbon tissue colour chart, consisting of six prints from one negative, in standard brown, warm sepia, portrait brown, red chalk, sea green, and engraving black. Then we have a bromide paper grade chart, the prints being on smooth, rough, "plat-mat," and enamel surfaces, and "Royal" and "C" toned. These two charts are supplied to Mr. Fry's customers for their own use, and photographers, doubtless, find them of considerable service in consulting the tastes of their sitters and patrons.



Contact carbon prints and a 12×10 enlargement from a quarter-plate negative are also before us. The latter is supplied to dealers for advertising purposes at a nominal cost. Some delightfully toned bromide prints complete Mr. Fry's consignment of spec mens.

We can give the quality of Mr. Fry's work the very highest praise. Not merely in the specimens under notice, but in many other prints and enlargements that have recently come before us in the ordinary way, we perceive the influence of a master hand. His long practical experience enables him to get the very best out of negative and printing process, and the perfect command he has over his work should bring him a wide share of support. Mr. Fry, in fact, is one of the best photo printers and enlargers that we have in Britain.

## News and Notes.

**PHOTOGRAPHIC CLUB.**—Wednesday evening, November 22, at eight o'clock, demonstration of the Secco film, by Messrs. Whitney, Graaff, & Co.

**ROYAL PHOTOGRAPHIC SOCIETY.**—Photo-mechanical Meeting, Tuesday, November 21, at 66, Russell-square, at eight p.m. "Architecture and Photography," by Mr. Henry W. Bennett.

At the forthcoming Exhibition of the South London Photographic Society, the following gentlemen have consented to judge the exhibits: Messrs. R. Child Bayley, F.R.P.S., Thomas Bedding, F.R.P.S., and E. J. Wall, F.R.P.S.

THE Hon. Secretary of the Whitehaven Camera Club writes: "I shall be glad if you will note in the next issue of your JOURNAL that the entries for our Exhibition close on November 23, and also that Mr. W. J. Warren, of Leeds, will be the Judge."

MR. W. H. ROGERS, Hon. Secretary, of the Croydon Camera Club, writes: "I shall be obliged if you will kindly note in your next issue that I have changed my address from 106, Holmstead-road, South Norwood, to 46, Bensham Manor-road, Thornton Heath."

THE "Mount" Postal Photographic Club wishes to secure a few more members, to raise number to twenty-five. None but pictorial workers need apply. Send specimens, or references to exhibition awards, to the Hon. Secretary (C. R. Fowler), School House, Wimborne.

THE WAR IN SOUTH AFRICA.—Messrs. Marion & Co., of Soho-square, announce that they will have ready in a few days nine portraits on one card, size of Downey's art studies, of Generals Buller, Symons, White, French, Gatacre, Lyttelton, Walker, Methuen, and Baden-Powell.

**EALING PHOTOGRAPHIC SOCIETY.**—The next meeting of this Society will be held at the Public Buildings, Ealing, W., on Monday, November 20, 1899, at 8.15 p.m. Subject, "Sandell Perfect Films." Demonstration consisting of development, a display of prints and about 100 lantern slides. By Mr. J. T. Sandell.

ON Monday, November 6, the South London Photographic Society had the pleasure of hearing Mr. E. Sanger Shepherd give his interesting lecture on Orthochromatics, which was illustrated by examples of his method of reproduction in natural colours. A highly interested audience greatly appreciated the lecturer's kindness in filling a vacancy at a short notice.

THE Red Cross Society are reported to have accepted the Duke of Newcastle's offer to furnish completely the *Princess of Wales* hospital ship, and that of a private donor, the *Union Steamer Spartan*, with Röntgen apparatus and photographic material. Under the direction of Mr. John Le Conteur, the outfit for the *Spartan* goes with the hospital ship *Princess of Wales* next Thursday.

**SOUTH AFRICA AND THE TRANSVAAL.**—By permission of the Cape Government railways, Mr. J. H. Steward, of 406 Strand, London, has produced a set of slides from photographs of places of special interest just now in connexion with the war in South Africa. Among them will be found some excellent views of Mafeking, Aliwal North, Bulawayo, Colesburg, and bridges over the Orange River and the Modder River.

DR. WILHELM ZENKER died on the 21st ult., after a long illness, aged seventy. He was a distinguished astronomer and physicist, and was the author of the first work on photography in natural colours, his *Lehrbuch der Photochromie* being published in 1868. This work is of special interest, as in it he fully explained the formation of colour photographs by stagnant waves, which is, as is well known, the fundamental theory of Lippmann's well-known work.

**CHRISTMAS LECTURES AT THE ROYAL INSTITUTION.**—The Annual Course of Christmas Lectures, specially adapted for young people, at the Royal Institution, will this year be delivered by Mr. Charles Vernon Boys, F.R.S. The subject will be "Fluids in Motion and at Rest." The lectures, which will be six in number, will commence on Thursday, December 28, at three o'clock. The remaining lectures will be delivered on December 30 and on January 2, 4, 6, and 9, 1900.

**CRIPPLEGATE PHOTOGRAPHIC SOCIETY AND ESSEX AND MIDDLESEX CYCLING UNION.**—The Annual Photographic Exhibition will be held on December 5, 6, and 7, at the Cripplegate Institute, Golden-lane, E.C. Intending exhibitors are reminded that the entries closed on Monday last, the 13th inst., but late entries will be received up to November 21. Twenty-five gold, gold cent e, silver, and bronze medals are offered in the nine classes. Entry forms can be obtained of the Hon. Secretaries, Alfred T. Ward, Cripplegate Institute, Golden-lane, E.C., and George F. Sharp, 31, Sach-road, Upp-r Clapton, N.E.

THE LUDLOW PHOTOGRAPHIC SOCIETY.—Mr. John Herbert Williams of Guildhall, Ludlow, writes: "I have resigned the office of Secretary of the Ludlow Photographic Society, and Mr. W. H. Bessell, of Gravel Hill, Ludlow, is now acting in that capacity. On October 27, Mr. W. Hurt Sitwell, of Ferny Hall, was appointed President. Messrs. H. J. Allcroft, Edward

Wood, A. R. Boughton Knight, Sir C. H. Rouse Boughton, Bart., and the Hon. Lucius O'Brien were appointed Vice-Presidents. Messrs. G. E. Davis, Tilsley Price, J. H. Suttle, W. H. Bessell, and J. H. Williams were appointed Committee; Mr. G. E. Davis, Treasurer. The club now numbers fifty-four members."

THE Edinburgh Photographic Society's Annual Exhibition of photographs will be held in the rooms of the Society, 38, Castle-street, Edinburgh, from Saturday, 10th, to Saturday, February 24, 1900. Entries close on Monday, January 29, 1900. A special gold medal has been offered by the President of the Society for the best picture in the Exhibition, the work of an amateur member. The following classes are open to all (gold, silver, and bronze medals in each class): Class 1, Landscape, seascape, and architecture; Class 2, Portraiture, figure, and animal studies. The Judges are Messrs. G. W. Johnstone, R.S.A., Edinburgh; Percy Lund, Bradford; John Stuart, Glasgow. All communications should be addressed to the Secretary, Mr. J. S. McCulloch, W.S., at 10A, George-street, Edinburgh.

**ROYAL SOCIETY.**—The following is a list of those who have been recommended by the President and Council of the Royal Society for election into the Council for the year 1900 at the anniversary meeting on November 30:—*President*: Lord Lister, F.R.C.S., D.C.L.—*Treasurer*: Alfred Bray Kempe, M.A.—*Secretaries*: Sir Michael Foster, K.C.B., M.A., M.D., D.C.L., LL.D., and Professor Arthur William Rücker, M.A., D.Sc.—*Foreign Secretary*: Thomas Edward Thorpe, Sc.D., LL.D.—*Other members of the Council*: Horace T. Brown, F.C.S., Captain Ettrick William Creak, R.N., Professor James Dewar, M.A., Professor Edwin Bailey Elliott, M.A., Hans Friedrich Gadow, Ph.D., Professor William Dobinson Halliburton, M.D., Professor William Abbott Herdman, D.Sc., Sir John Murray, K.C.B., Sir Andrew Noble, K.C.B., Professor Arnold William Reinold, M.A., George Johnstone Stoney, D.Sc., George James Symons, F.R.Met.Soc., J. J. H. Teall, M.A., Professor Joseph John Thomson, M.A., Professor Edward Burnett Tylor, D.C.L., and Sir Samuel Wilks, M.D.

**SECCO FILMS (BRITISH AND COLONIAL), LIMITED.**—The statutory meeting of this Company was held at Winchester House, Old Broad-street, on Saturday last, when there was a fair attendance of shareholders. The proceedings were of a formal character, and involved the proposal of a single resolution dealing with an amendment of the original scheme with regard to working capital. This was carried unanimously, after being seconded by one of the shareholders present, who expressed his satisfaction with the prospects of the Company after hearing the lucid statement which had been made by the Chairman, Sir Roger Goldsworthy. The Directors have been meeting weekly, and have devoted much time to the initial work of starting the Company on a satisfactory footing. It is the intention to secure a building at once, and three or four suitable ones, within easy reach of London, are now under consideration. The fitting of the structure ultimately decided upon will not occupy many months, and in the mean time arrangements will be made for supplying the public with film. There is every reason to suppose that, before the photographic season of 1900 opens, the Secco factory will be at work.

At the Yarmouth County Court, on November 10, before His Honour Judge Wilmot, an action was brought by Mr. A. T. Taylor, solicitor of Yarmouth, against Mr. George Brewer, a photographer of the same town, to recover possession of some photographic negatives under somewhat singular circumstances. The evidence was to the effect that, at an auction sale, the defendant purchased about 5000 negatives, among them being the negative of plaintiff, his wife, and his mother, all of which plaintiff asked should be returned to him. The negatives were taken by Messrs. Boughton in 1895, and they passed to their successors, Messrs. Tilley, and, when the auction of the photographic effects took place, the defendant purchased the negatives amongst other things. The plaintiff had applied to the defendant for the negatives to be returned to him, but the defendant had declined to do so unless he was paid for them. The plaintiff submitted to His Honour that the negatives belonged to him. Mr. Clowes, who appeared for the defendant, contended that they belonged to the defendant, although he admitted that the plaintiff might have the right to reproduction. The defendant said that, when he purchased the negatives, a lot of them were broken, and others had been stolen. They were not classified, and it would take him six months to make a search. It was not the custom of photographers to give up the negatives unless a special contract was made when the sitting took place. His Honour said he was clearly of opinion that the negatives were the property of the customer. It was just the same when one had a plate engraved for cards. He thought a case had been decided, in which it was held that the property in the negative passed to the sitter. However, as it was a somewhat important point, he would adjourn the case for a month, and look up the authorities on the subject.

## Patent News.

THE following applications for Patents were made between October 30 and November 4, 1899:—

"APPLIANCE."—No. 21,696. "An Improved Appliance for use in Photographic Processes." H. C. ST. PHENS.

COPYING APPARATUS.—No. 21,783. "Improvements connected with Photographic Copying Apparatus." B. J. HALL.

CINEMATOGRAPHIC APPARATUS.—No. 21,863. "Improvements in Kinematographic Apparatus." J. A. PRESTWICH.

CINEMATOGRAPHIC APPARATUS.—No. 21,880. "Improvements in or relating to Kineticoscopic or Cinematographic Apparatus." W. FRIESE-GREENE and F. Z. MAGUIRE.

CAMERAS.—No. 21,873. "Improvements in and relating to Photographic Cameras." Complete specification. H. SMYTH.

PRINTING APPARATUS.—No. 22,017. "Improvements in Image-forming Mechanism, chiefly designed for use in connexion with Photographic Printing." F. H. RICHARDS.



## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
20	Bradford Photo. Society	Demonstration: Wellington Film. Harry Wade.
21	Cripplegate Photo. Society	Viccol P.O.P. T. Thorne Baker.
20	Ealing	Demonstration: Sandell Perfect Films. J. T. Sandell.
20	South London	Excursion Slide Competition.
20	Stafford Photo. Society	Sale of Papers, &c.
21	Birmingham Photo. Society	Home Portraiture. Harold Baker.
21	Gospel Oak	Demonstration: Viccol Paper. Berger & Co.
21	Hackney	The Pictorial Treatment of Lantern Slides. J. A. Hodges, F.R.P.S.
21	Royal Photographic Society	Architectural Photography. Henry W. Bennet.
22	Ashton-under-Lyne	Demonstration: The Carbon Process. Harry Wade.
22	Croydon Camera Club	The Gravura Printing Process. A. C. Baldwin.
22	Photographic Club	Demonstration: The Secoco Film. Messrs. Whitney, Graff, & Co.
22	Southsea	Demonstration: Dektol, and other Eastman Specialities. Percy Hume.
22	West Surrey	Developing P.O.P. C. Sheed.
23-25	Kingston-on-Thames	Fourth Exhibition of Members' Work.
23	Liverpool Amateur	Demonstration: Intensification and Reduction. Harry Wade.
23	London and Provincial	Lovestoft and Neighbourhood. H. Vivian Hyde.
24	Bristol and West of England	Demonstration: The Platinum Printing Process. W. H. Smith.
24	Croydon Microscopical	Trial Night for Members' Slides.
24	West London	Beginners' Meeting: Apparatus. L. Selby.

### ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 14.—Ordinary Meeting.—The Right Hon. the Earl of Crawford, K.T. (President), in the chair.

#### THE SOCIETY'S NEW HOUSE.

This being the first meeting of the Society in its new premises, the PRESIDENT welcomed the large assemblage of members who were present, and expressed the hope that they were all as well satisfied with the accommodation afforded as he was himself.

#### GENERAL BUSINESS.

Forty-seven new members were elected, and thirteen candidates for membership were nominated.

The PRESIDENT announced the admission to affiliation of the Glasgow Photographic Association, the Brentford Photographic Society, and the Banbury District Photographic Society.

At the conclusion of the formal business, the meeting was adjourned.

#### TRAILL TAYLOR MEMORIAL LECTURE.—"TEACHINGS OF DAGUERRETYPE."

Mr. A. Haddon then took the chair, and

Major-General J. WATERHOUSE, I.S.O., proceeded to deliver the second Traill Taylor memorial lecture, the subject being "The Teachings of Daguerreotype." The process, he said, was for a long time considered as unique and without any intimate connexion with the ordinary photographic methods, but Carey Lea was among the first to show that this view was erroneous, and that the Daguerreotype image is subject to the same laws as govern the wet-collodion and other processes for making negatives. The lecturer had last year gone further in this direction, and the result of his investigations went to show that the process might be regarded as an epitome of the photo-plate, and from this point of view it was of special value, because it depended upon the employment of haloid salts of silver, formed by the direct union of the halogen and the metal. This being the case, a good deal of valuable information should be derived from a careful investigation of the process in its various modifications with different halogens or combinations of them, and with different methods of developing and dissolving away the images formed by the action of light. After describing the Daguerreotype process, General Waterhouse said one was first struck by the fact that the sensitive surface of the plate was formed by the direct combination of halogens, iodine, bromine, or chlorine, with the silver of the plate, and the question arose, to which of these elements was the sensitiveness due? Moser's researches on the sensitiveness of silver to light were considered, and the lecturer detailed his own experiments in confirmation of them. He had also obtained some very interesting results with silvered glass plates formed with peroxide of hydrogen before exposure, and found that it was capable of acting in the same way as iodine in sensitising the plate. Nearly all the photographic phenomena, such as the development of an invisible image, the production of a visible image, reversal on development, and the effects of pressure in producing a developable image, could be shown on a plain silver plate. After discussing the properties of the halogens generally used in combination with silver, and the combinations of halogens with silver, the composition of the sensitive surface of the Daguerreotype plate was dealt with. That it is formed by one of the lower compounds of silver and iodine, and not of the pure iodide, was, he thought, shown by the fact that, if a thin film of silver leaf or of silver on glass were iodised till all the silver combined with iodine, there would be produced an almost transparent pale yellow film, which would not visibly darken, even in bright sunshine, and which would require a very long exposure to yield even a developable image. Professor Meldola had suggested that the silver iodide on the Daguerreotype plate formed its own sensitiser, a view with which General Waterhouse concurred. The phenomena known as Talbot's iodine

rings next received attention, the lecturer stating that it was not clear to him to what the vivid colouration was due, unless it were a molecular change in the structure of the film caused by the passage of the iodine vapour along it. The results of Professor J. W. Draper's investigations upon the subject of the relative sensitiveness of the various tints produced on the surface of the Daguerreotype plate by the vapour of iodine were quoted and discussed, together with the late Dr. H. W. Vogel's discovery of the modern system of orthochromatic photography and the application of "optical sensitisers" to the ordinary photographic dry plates. Turning to the developing action of red and yellow light, the lecturer said that one of the most curious phenomena connected with the early working of Daguerreotype plates was the action of red or yellow light upon the images formed either in the camera or by printing out. If a short normal exposure were given to an iodised silver plate, and if it were then exposed in the sunlight under a red glass for about twenty minutes, a completely printed-out image would be produced. The question of the action of light upon a surface composed of pure silver iodide was finally considered, and the researches of Schultz-Sellack, Scholl, Arrhenius, Hunt, Abney, Meldola, and others, were very fully detailed and compared with the observations of the lecturer.

General Waterhouse's lecture was of a most exhaustive and comprehensive character, and it is impossible to do more on this occasion than briefly indicate, as we have endeavoured to do above, the lines upon which he treated the subject. It will be regarded, we think, as a masterly exposition of a very complex question, and one which will form a worthy memorial to the eminent photographer with whose name it is associated.

After a few remarks by the CHAIRMAN, Mr. CHAPMAN JONES, and Mr. J. SPILLER, to which General WATERHOUSE replied,

The CHAIRMAN presented the lecturer with the Traill Taylor Memorial medal, and also handed to Mr. T. R. Dallmeyer a similar medal in respect of his lecture delivered in 1898 on "Focometry and a Focometer."

#### COMING EVENTS.

November 21, "Architectural Photography," by Mr. H. W. Bennett. November 28, "Practical Three-colour Lantern-slide Making," by Mr. E. Sanger Shepherd. December 5, "Lincoln Cathedral," by Mr. Frederick H. Evans (Lantern Evening).

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 9.—Mr. J. S. Teape in the chair.

Mr. BALDWIN, on behalf of the Paget Prize Plate Company, described the new Gravura plates and paper. The nature of the new materials may perhaps be best denoted by the statement that they resemble very closely the now well-known Velox specialities. The emulsion is one which gives, by simple development and every certainty, a great variety of colours, ranging from blue-black through rich browns and sepias to brilliant red chalk. Mr. Baldwin said he was able to show, for the first time, another departure from the usual thing in the form of Gravura opals, a plate that was only just being put upon the market. With reference to the use of Gravura productions, he had been often asked to name the best form of light for making the exposure to. His answer was that any light suitable for bromide work was suitable for Gravura: daylight, gas-light—plain or incandescent—the electric light, or, last but not least, serviceable, magnesium ribbon. Magnesium ribbon, he thought, provided the best fixed quantity of light, and it could be carried about so conveniently. The primary point of attraction for Gravura is, doubtless, that its manipulations may be conducted in an ordinary gas-lighted room or in dim daylight. This quality naturally presupposes that the emulsion is a slow one. As a matter of fact, exposure for black tones (which require the shortest exposure) will probably range from one to two minutes at four inches from the usual household gas flame. To daylight, according to its intensity, from one second upwards in diffused light a few feet away from the window would do, or an inch of magnesium ribbon burnt at a distance of a foot or more. Mr. Baldwin showed the capabilities of paper, opals, and lantern plates by a practical demonstration, producing positives covering fully the range of colour claimed for the specialities. The rule for the production of warm tones is that the exposure suitable for black is considerably increased, and the developer correspondingly restrained and diluted. The developer for black tones is in a concentrated form, and is a hydroquinone-metol formula. It can be purchased in sealed tubes ready mixed, and only requires breaking into four ounces of distilled water. The need for distilled water was often called into question, but Mr. Baldwin would say that, whatever one mixed with his whisky, give him distilled water for his Gravura operations. He showed a series of prints from one negative showing the many shades of colour one could get by systematically varying one's methods. Taking the exposure for black tones as one, that for red chalk, the longest, would be eight to ten. The concentrated developer has to be diluted, variously for the several colours, until 1 ounce is mixed with 20 ounces of water for the red chalk tones. It requires also the addition of a quantity of "A. C. solution," so called, made up of ammonium bromide, ammonium carbonate, and water. This latter solution is employed for all warm tones. The opals require exactly the same treatment as the paper. The negative should best be one tending towards softness, as the emulsion itself has a contrary leaning.

The demonstration which accompanied Mr. Baldwin's remarks was very instructive, and the examples spoke well for the paper, the opals, and the lantern plates.

Mr. WALTER D. WELFORD entered briefly into an account of his experiments on the question of the continued use of developing solutions, especially in regard to ortol. He had succeeded in developing 33 quarter-plates, two at a time, in 2 ounces of solution, taking altogether a period of 72 minutes. He had afterwards developed 19 half plates in 2 ounces of solution, one at a time. The first quarter-plate was finished in 2 minutes, the seventh in 3 minutes, the twelfth in 7 minutes, the twentieth in 9 minutes, the twenty-fifth in 9 minutes, and the thirty-third in 9½ minutes, showing a gradual increase of time with the repeated use of solution. The first half-plate took 2½ minutes, the nineteenth took 10 minutes. He would challenge anybody to differentiate between the first and last. This quality of the solution of remaining efficient for so long was, of course, only good for correct exposures.



The CHAIRMAN thought that in general work it would be found inadvisable to use a solution so repeatedly.

Mr. S. H. FRY, as one opposed to the use of a solution more than once, said it was not so much upon the question of possibility that the discussion really centered as upon advisability.

Mr. WELFORD asked why not, when one could get a good and proper result?

#### PHOTOGRAPHIC CLUB.

NOVEMBER 8.—Mr. J. W. Mason in the chair.

Mr. FOXLEE showed some enamels made in 1864 by Lafon de Camarsac.

Mr. WELFORD, who had lately given his special attention to ortol, and who had already previously addressed the Club on the subject of this developer, mentioned the great economy with which the same could be worked as compared with other developers. His first experiment revealed the fact that thirty-three quarter-plates could be developed with two ounces of solution, and, on a later occasion, he even managed to develop nineteen half-plates with the same quantity of ortol developer. The only trouble he experienced was the gradual diminution of the bulk of the solution, which only measured nine drachms when the nineteenth half-plate had been developed. The last negative was just as perfectly developed as the first, although it required a much longer time to finish it. The plates used for this experiment were, of course, all properly exposed, or, at least, not under-exposed. Mr. Welford thought that, in the case of a series of absolutely exactly exposed negatives, where no restrainer was necessary, the developer could even be used more often. A further peculiarity of ortol was that, when making up the solution, it was not necessary to be so very exact about the proportion of the various chemicals used as in the case of other developers, except with regard to the quantity of bromide, which must be increased when no sulphite is used, and *vice versa*. Mr. Welford found that ortol was one of the best all-round chemicals in the dark room. He thought it most likely that ortol would eventually replace pyro. Used in a normally strong solution, it will not stain the fingers in the least. Speaking of his experiments with the new developers generally, Mr. Welford had come to the conclusion that the addition of the reagent does not quicken development at the same rate as pyro would if used with soda, and he thought this question was well worth closer examination.

Mr. MACKIE brought to the notice of the Club the case of two negatives of the same subject which had received the same exposure, and one of which was treated with a solution of one grain of pyro and twenty-four grains of soda per ounce, whilst the developer used for the other contained four times the quantity of pyro to the same soda solution. Contrary to what one would expect, the developer richer in pyro made the image appear more slowly than the poorer solution, but finished the picture in a shorter time.

The CHAIRMAN having asked the opinion of members on the Agfa intensifier, it was found that the same had not been extensively used, but the few trials had revealed the fact that it acted comparatively slowly.

Mr. TOTTEM stated that he had very satisfactory results with Antogene, both as an intensifier (followed by redevelopment) and as a reducer (followed by hypo).

Richmond Camera Club.—The meeting on November 6, to which ladies were invited, was devoted to

#### A TOUR THROUGH ITALY, SPAIN, AND ALGERIA,

illustrated with a large number of very beautiful slides by Mr. H. LITTLE, who described the various subjects as they appeared on the screen. At the conclusion of the meeting a hearty vote of thanks to Mr. Little for the very interesting evening's entertainment he had afforded the Club was passed with applause.

#### FORTHCOMING EXHIBITIONS.

1899.

- November 17 ..... Hackney Photographic Society. W. Selfe, 70, Paragon-road, Hackney, N.E.  
 „ 17-19 ..... Philadelphia Photographic Salon. Foreign Representative, A. Horsley Hinton, 1, Creed-lane, E.C.  
 „ 20-25 ..... Longton and District Photographic Society. Thomas Mottershead, 43, Stafford-street, Longton, Staffordshire.  
 „ 27-Dec. 18 American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.

December 7-9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.

„ 11-Jan. 1900 Huddersfield (Invitation). W. A. Beevers, Cloth Hall-street, Huddersfield.

„ 27-30 ..... Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.

1900.

January 29-31 ..... Southsea Amateur Photographic Society. F. J. Mortimer, 10, Ordinance-row, Portsea.

April 3-7 ..... Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### THE PRINCIPLES OF DEVELOPMENT.

To the EDITORS.

GENTLEMEN,—In the brief summary you gave in your last issue, p. 716, of Mr. Watkins' paper on the above subject, I note that in the second paragraph of your article it is stated:—

(a) "Longer development, as a general rule gives greater contrasts."

(b) "It was a common belief that over-exposure led to thinness of results, but this was a mistake, for full development would ensure enough density to meet all needs."

(c) "There is for every plate a minimum exposure below which there is no developable impression made upon its sensitive coating, while at the other end of the scale was a maximum beyond which no effort could induce further effect."

(d) "A common belief was that metal had the power of bringing out the upper tones of the negative more quickly than any other developer. His experiments showed that all developers act in much the same ratio."

First as to paragraph (c), while the first section is axiomatic the second requires modification, for, while quite correct as to exposures within limits, it must be modified as regards such extreme over-exposure as to cause reversal of the highest lights, as in, say, a window brilliantly lighted and forming part of an interior view.

Then as to the concluding paragraph of (d). No doubt this is correct, the mistaken idea as to the metal being the result merely due to its very rapid surface action.

But, and this is my reason for writing, it seems to me that these considerations and paragraph (a) are mutually destructive.

Keeping the concluding paragraphs of (c) and (d) in mind, let us start to develop first a fully exposed plate; if we stop anywhere short of full development, the ratio of density or contrast will everywhere be in proportion to light action; but, if we continue development until the maximum effect has been produced in the highest lights, is it not evident that longer development must bring up the density of half-tones and shadow detail, and so diminish, and not increase, contrast?

This is still more evident in the case of over-exposure up to the point of reversal, hence I fail to see how (a) can be true as a general proposition. As to paragraph (b), I take it the common experience is that, with over-exposure, not previously known and therefore guarded against, there is such a rapid reduction all over the sensitive surface that ratio of reduction seems lost, or, at any rate, all due balance is, and that a continuation of the action of the developer still further flattens the result, and, while no doubt producing greater density, does not restore the lost balance, so it does not seem to me the statement that "full development would ensure enough density to meet all needs" will bear examination, for it should mean that a sufficient development would give a usable negative of full density, whereas it does give a negative in which all balance or contrast is wanting.

If the reply is that the developer must, before use, be modified to meet the case, this not only presupposes knowledge of the over-exposure, but introduces the wider question of what is over-exposure. Is it not a relative term which can only be discussed as applied to the use of a standard developer?—I am, yours, &c., E. H. MICKLEWOOD.

5 St. Michael's-terrace, Plymouth.

#### AUTOMATIC SLIDE CHANGING.

To the EDITORS.

GENTLEMEN,—In your reply to "C. K. T." (October 27) you quote his question, "Is there any arrangement for the lecturer to press the button and automatically change the slide." Whilst in Dublin 1897, one of the employees of the Dunlop Tyre Company showed me his invention for slide-changing from the platform. Its ingenuity and utility rather impressed me, and it was only fitted up at the place I was then lecturing at. The slides had to be inserted by an attendant at the lantern, but a simple push at the end of an electric wire effected the change. I tried it thoroughly and found it work admirably. The change takes place at the exact moment desired by the lecturer, and saves all signals, &c. After my return to London I received a communication from the inventor, asking for my written opinion of it to lay before a manufacturer or dealer. Since that time, however (1897), I have not seen or heard anything further; but the idea is good, and I hope this letter will catch the eye of somebody with fuller knowledge of the circumstances.—I am, yours, &c., WALTER D. WELFORD.



## AN APPEAL.

To the Editors.

GENTLEMEN,—The Corporation has again granted the use of the Guildhall for the annual banquet to the Ragged School children of London, and the Prince of Wales has once more sent me a donation to, if I may quote the words of His Royal Highness, "the excellent Fund which you are again kindly raising for providing dinners and hampers for the poor and crippled children of the Metropolis at Christmas."

Last year, after providing a banquet at the Guildhall for about 1400 poor children, I was enabled to send 4324 hampers to deserving little cripples, whose affliction very often keeps them prisoners in one-room homes from year's end to year's end.

I trust that, with the renewal of your valued sympathy and assistance, we shall do better still this year by increasing the number of hampers to 5000.

May I ask your readers to help me again this winter to brighten the lives of some of London's little cripples? Subscriptions should be sent to me here, marked "Children's Fund."—I am yours, &c.,

W. P. TRELOAR, Alderman and Sheriff.

Ludgate-hill, London, E.C., November, 1899.

We are happy to insert Alderman Treloar's appeal. It might be possible to provide an optical-lantern entertainment at the Guildhall Banquet to the children; if so, some of our readers would, doubtless, assist.—EBS.]

## CHEAP ENLARGEMENTS.

To the Editors.

GENTLEMEN,—I am pleased to be able to tell you that your congratulations may now be extended from the *Stage* to the *Sun*, the latter journal having withdrawn from its offer of "crayon portraits" the paragraph to which I referred in your issue of the 3rd inst. This result is probably largely due to your editorial comments in the current number of THE BRITISH JOURNAL OF PHOTOGRAPHY, for which the profession will thank you.

I may add that I am quite in sympathy with the desire of a "Photographer of Forty Years' Standing" for more unity and co-operation amongst photographers, though I do not agree with his somewhat pessimistic idea that we are powerless individually. For many reasons combination will be very difficult to obtain, but I think that individual efforts for the benefit of the profession will render it more possible in the long run.—I am, yours, &c.,

DRINKWATER BUTT, F.R.P.S.

35, Keppel-street, Russell-square, W.C., November 11, 1899.

## SPOTS ON MATT-SURFACE PRINTS.

To the Editors.

GENTLEMEN,—Seeing "Collodion's" query in Correspondence column last week re matt-surface prints, it has prompted me to give my experience with this paper.

I also am troubled with spots and markings, as described by your correspondent, which sometimes present themselves next morning, having been toned the previous night, and more often not showing until perhaps a fortnight afterwards, or again three months or so. Looking at several lying before me as I write, they give one the impression that some chemicals were at work underneath the surface of them causing the spots and meanness referred to, although I can assure you that the various manipulations which they are put through are thorough in the extreme, and at the same time all dishes are given a good wash out before commencing to tone, &c. After toning, they receive twenty minutes' fixing in a bath of the prescribed strength, being constantly kept on the move. They then get from two to two and a half hours' washing in running water, during that time receiving from thirty to forty changes by hand from one dish to another. Perhaps some of your kind readers might, by giving us their experiences, be able to help some of their less fortunate workers out of their difficulties.—I am, yours, &c.,

PHOTOGRAPHER.

## THE RECENT EXHIBITIONS.

To the Editors.

GENTLEMEN,—I should like to be allowed to express my approbation of the sentiments expressed by "Free Lance," in your last impression, with regard to the recent photographic Exhibitions. That those whom it may concern will take his remarks to heart, is a "consummation devoutly to be wished."

But, please, Mr. "Free Lance," it is Sir Peter Teazle, in Sheridan's immortal comedy, who says, "Damn your sentiments," not Charles Surface.—I am, yours, &c.,

F. A. BRIDGE.

East Lodge, Dalston lane, London, N.E., November 13, 1899.

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

AN AMERICAN (New York).—We are much obliged for your card. Will you not authenticate it with your name and address?

G. BREWER; L. URBINSKY.—The negatives are the property of the photographer. We shall have some remarks on the subject in our next issue.

PHOTOFAD.—Ascertain by practical experiment where the light from the condenser (1) converges to a point and (2) is of the diameter of which the parallel beam is required, and then at 2 insert a concave lens, the focus of which is equal to the distance between 1 and 2.

PRESERVING A POTATO.—CURIO says: "We have had a curio in the shape of a Magnum potato brought to be photographed. Could you inform us how or where the tuber could be preserved or petrified?"—We cannot. Possibly some reader can kindly assist our correspondent in the matter.

ADDRESS WANTED.—BLACKBURN & Co. ask: "Can you give us the name and address of an English wholesale glass and fancy photographic frame and stand-maker?"—Marion's and other large houses supply these goods wholesale and retail. We cannot give the names of English manufacturers.

THE POISONS ACT.—DEALER asks: "Is it against the Poisons Act for a dealer in photographic materials to supply bichloride of mercury, wholesale and retail, either in crystals or in solution? Is it necessary to label 'poison'?"—Yes, unless the dealer is a pharmaceutical chemist. In any case, the bottle or parcel must be labelled "poison."

BOOK OF POSES.—POSING says: "Will you kindly tell me if you know any firm who publishes a book of poses; such a book would be very acceptable to a beginner, as, by studying the various subjects therein, he would at all times get a decent pose?"—Messrs. Dawbarn & Ward, Farringdon-avenue, publish a work on lighting and posing. We should advise you to obtain that.

ROTHENBURG.—COL. GUBBINS writes: "I read in the last JOURNAL an account of a lecture given before the R.P.S. by Mr. Vezey on 'Some Medieval Towns of Germany.' The first town mentioned is Rothenburg. Wishing to know its whereabouts, I looked it up in my atlas, and find that there are no less than four towns of that name: 1, in Bavaria (Middle Franconia); 2, Hesse Cassel; 3, Posen; 4, Silesia. Can you tell me which of these four is the one referred to?"—In reply: Rothenburg in Bavaria, about thirty miles S.E. of Würzburg.

COPYING.—ENLARGEMENT says: "Will you kindly inform me how to make a negative from a cabinet or carte-de-visite photograph without showing the margin of the mount that is always left? Of course, you will know if I get the print only, the full size of the negative, then it takes the head or feet off the figure. I want these negatives for making bromide enlargements, so you see I find this margin a difficulty."—We are afraid we do not clearly understand this query. If the margin of the mount is not desired, it can be covered up with paper. Why the head or feet are cut off when the print only is included, is, we presume, that the plate used for the negative is not large enough to include them.

FORMALIN.—ABBOT PASLINW says: "I should be glad if you could give me a reply through columns of THE BRITISH JOURNAL OF PHOTOGRAPHY with regard to the use of formalin in printing and development. 1. Is formalin (i.e.,  $\text{CH}_2\text{O}$ , forty per cent.) a fairly stable solution, and not prone to decomposition if kept cool in stoppered bottle? 2. In case of P.O.P., is it best to use before toning, as Ilford Company recommend alum? and, in that case, what strength solution, and how long? Is lengthy washing necessary, i.e., has it any effect on the toning or fixing solution? 3. As No. 2, only with regard to status, strength of solution, and before or after fixing?"—In reply: 1. Yes. 2. It is not very important which. The strength is not very important; the weaker it is, the longer time should be given. Rather less washing than with alum will suffice. 3. Again unimportant, but we prefer before fixing. On page 397 of the ALMANAC for 1896 is an article on experiments with formalin. You will do well to read that.

IMPERFECT FIXATION.—J. H. G. says: "1. I shall be glad of your opinion as to the cause of marking on two of the enclosed negatives. The two cabinet vignette negatives were most probably washed in the tank at the same time, and have been stored away together; they were taken about four years ago. I have others taken about the same time that are all right, and others marked, and also marked ones of only two years' old. By the three-quarter length negative you can see it is as much on the glass as the film. The copy negative enclosed was washed in the same way (and all my negatives), but is another maker's plate, which I use for copying. I have looked up several of this make of the same age, and they are in good condition. All my negatives from 1885 to 1893 or 1894 are as good as when taken. Developer used for enclosed plates was pyro ammonia, but those I mentioned of two years ago were pyro and soda. I should be extremely obliged if you can enlighten me on the matter, and (2) at the same time say if you think soda is to be preferred to ammonia for a (developer) person subject to eczema in the hands, and of rather a bad form—in other words, do you think one more poisonous or likely to do more harm to the disease? I thank you in anticipation."—In reply: 1. A careful examination of the negatives convinces us that imperfect fixation is the cause of the trouble. The hyposulphites left in the film have reacted on to the glass, hence the markings on the latter. 2. No difference in the behaviour of the developers named in the circumstances named—that is, so far as we are aware.



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## THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1900.

Edited by THOMAS BEDDING.

THE Thirty-ninth Annual Issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be published on December 1. The volume reaches the unprecedented total of 1512 pages, and is the largest yet published. As hitherto, it will be issued in paper covers, price 1s.; cloth bound, 1s. 6d.

The frontispiece is a bromide print by Messrs. Wellington & Ward, of Elstree, from a negative by Mr. H. Walter Barnett, of No. 1, Parkside, Knightsbridge. Many other illustrations are also given in the text matter.

Eighty articles, on a great variety of subjects interesting to photographers, and contributed by the principal authorities of the day, form a feature of the volume. The other sections are "Epitome of Progress during 1899," "Patented Inventions of the Year," "Miscellaneous Information," "Practical Notes and Suggestions of the Year," which, with the large collection of formulæ, tabulated matter, and a great deal of other information of use to all photographers, places at their disposal,

for constant reference, a fund of technical knowledge which is not to be found in any other photographic annual.

## EX CATHEDRÂ.

We print this week the second Traill Taylor Memorial Lecture, delivered on Tuesday week by Major-General Waterhouse, before an excellent attendance, at No. 66, Russell-square, W.C. The experiments of the distinguished author have covered a wide field, and he was able to tell his hearers of many interesting and unsuspected phenomena to which silvered surfaces give rise. In particular, the distinct resemblances traceable in several respects between plates silvered for Daguerreotype and the haloid salts of silver is a discovery of great value; but the entire lecture teems with chemical and physical data which add materially to our knowledge of the fundamental characteristics of a branch of photography not hitherto fully made clear, and well repays perusal on that account, as well for the new vista of experimental work which it opens up. We shall take future opportunities of referring to General Waterhouse's valuable lecture.

\* \* \*

GENERAL WATERHOUSE'S exposition of the teachings of Daguerreotype worthily succeeds the lecture on "Focometry" given by Mr. Dallmeyer twelve months ago, and the fact that two of the greatest authorities in their respective branches of investigation have already been the recipients of medals for the delivery of Traill Taylor Memorial Lectures may, no doubt, be taken as an indication of the high esteem in which the honour of delivering that lecture will in future be held. It is almost four years to the day that in these pages we suggested that steps should be taken to perpetuate the memory amongst photographers of our late friend and predecessor, and we are very gratified to feel that the annual lectureship which constitutes the memorial has been so firmly established in general favour, and gives promise, as time goes on, of largely adding to our photographic knowledge, to which, during his long association with this JOURNAL, Mr. Traill Taylor made so many valuable contributions. A word of thanks should here be passed to the Memorial Committee for their labours in the matter; but above all to Mr. Philip Everitt, who has devoted a



very great deal of time and trouble as Honorary Secretary, the best thanks of the subscribers and all interested in the Memorial are distinctly due.

\* \* \*

IN another part of this week's JOURNAL we print the report of a demonstration of a "new method of artificial lighting for portraiture," given at a recent meeting of the Croydon Camera Club, by Mr. W. H. Smith of the Platinotype Company. The system takes advantage of the combustion of magnesium in oxygen for obtaining illumination of such great power and brilliancy that studio exposures of one second, or even the half or quarter of a second, may be given and results obtained which are indistinguishable from portraits made by the aid of daylight. A considerable number of specimen prints from negatives produced by the new system of lighting have been shown to us, and we have no hesitation in stating that they are such as would well pass for first-rate daylight work.

\* \* \*

WE shall shortly give a fuller description of the new method of magnesium lighting about to be introduced by the Platinotype Company, but its main features may here be briefly summarised: Imagine a room lined with paper for the purpose of diffusing the light. The source of illumination is magnesium ribbon suspended in a vessel containing oxygen, and ignition is obtained by electrical means. The supply of oxygen gas into the combustion chamber is automatically controlled, and a hundred exposures may be made by means of one foot of the gas. The cost of a single exposure is as low as a fraction of a penny, and the total expense of the installation will, we are assured, be within the reach of all. As we have already mentioned, the Platinotype Company, of Bloomsbury-street, will shortly place the new lighting system on the market. On the data laid before us we have formed a very high opinion indeed of the latest method of using magnesium for artificial-light portraiture. In the course of each year large numbers of photographers ask us to recommend them a cheap and effective system of working in the studio independently of solar light. The Platinotype Company's new system should therefore meet a wide range of requirements. In the dull weather recently experienced all over the country, it would, no doubt, have been found of the very highest value and convenience. Public demonstrations of the new light will shortly be given at the Platinotype Company's offices, Bloomsbury-street, London.

\* \* \*

By the kindness of Mr. Horace Wilmer we are enabled to print the following eulogy of the late W. K. Burton, which recently appeared in a Far Eastern contemporary: "In the death of Professor W. K. Burton, Japan has lost an efficient helper and the foreign community a most genial friend. A man of eminently good family stock, of high scientific training and attainment, of extraordinary nervous energy, and of an open and generous disposition, he has succumbed to the defects of his qualities. At home he might easily have grasped eminence and success. Here he has fallen an early victim to the peculiar social conditions and climatic influences which, in this so-called Lotus-land, keep the nerves in the highest state of tension, and thus quickly exhaust men of his temperament. His loss will be keenly felt by all who have known him."

It is reported in one of our contemporaries that a remarkable collection of films for moving picture machinery is now being developed at the laboratory of Mr. Edison. The pictures are of the Klondike, and are intended for the exhibit Mr. Edison is to make at the Paris Exposition. The entire series will show actual life in the Klondike as it has never before been shown. The positive pictures on the film are nine times the size of the ordinary ones, and, in order to use the larger film, it was necessary to reduce the speed of the camera from forty-five to twenty pictures a second.

\* \* \*

*South Africa* gives the following item of curious information relating to the manufacture in Paris of war photographs to order: The persons who happened to be in the Buttes-Chaumont Park the other afternoon were astonished to see a group of English soldiers occupying the top of a knoll. The men were ranged as if expecting an attack, some of them placed as advance sentinels, others taking advantage of the cover afforded by trees, and the remainder ranged in firing order along the crest of the slight eminence. Presently a "commando" of Boers surged out from below, opened fire on the English, and proceeded to storm the hill. For a moment the spectators were inclined to wonder whether the English and Dutch residents in Paris had decided to settle their differences by mortal combat. In any case, what was afoot was sufficiently mysterious until the truth was explained. The editor already mentioned is desirous of giving his readers realistic photographs of the Transvaal War, taken, of course, by a special correspondent. Genuine photographs of this kind would naturally be difficult to obtain, so the editor had hit on the idea of dressing up a number of theatrical "supers" as English and Boers, of making them go through a series of military operations, and of having photographs taken of the scenes thus contrived. In consequence, Londoners must not be surprised if they shortly obtain, *via* Paris, what purport to be Kodak reproductions of the wounding of General Symons, and other prominent incidents of the war. There seem to have been no mules at the Buttes-Chaumont, or doubtless the famous stampede would figure in the series of pictures.

#### THE RIGHT TO THE NEGATIVE.

ONE would have thought, from the number of times this matter has been settled in law courts, and in favour of the photographer, that we had heard the last of it. Not so, however, for it has cropped up again, as was seen by a report in our last issue, of a case in the Yarmouth County Court, before his Honour Judge Wilmot, where a Mr. Taylor, a solicitor, sued Mr. Brewer to recover possession of some photographic negatives under what are termed "singular circumstances." Well, they are singular.

Briefly they are these: A, in 1895, has some portraits taken by B. B, after a time, sells his business and negatives to C. C, some time afterwards, disposed of his stock at auction, and the negatives were purchased by D, the defendant in the present case. Now A is suing D for the negatives from which B supplied the portraits. The lay mind would naturally have thought that if A had any cause of action at all, it would have been against B, the only one with whom he had dealings, and not D, who bought the negatives at an auction years afterwards. But we suppose that such is not the case,



as this point does not appear to have been raised. It may be, however, that the photographer, instead of raising any legal quibble, preferred to defend the action on its merits, i.e., that the negative is the property of the photographer who takes it, as it has been proved to be over and over again.

There is an unwritten law, "custom of trade," which has great weight in law cases. From the very earliest days of photography the negative has always been considered the property of the photographer, and not of the sitter. One of the old arguments urged has been the custom with card plates, but it is not analogous. Here a charge is made for plate, and so many cards so much. The plate, by the "custom of trade," and as a distinct charge made for it, is the property of the customer; but, if the cards were printed by letterpress or lithography, the customer has no title to the forme or stone used any more than he has to the lasts upon which his boots are made, unless, indeed, he has specially paid for the lasts to be made; then, of course, they are his property. In the case now before the Yarmouth County Court the Judge is reported to have said that he was clearly of opinion that the property of the negative rested with the customer, and not with the photographer, adding, that "he thought there was a decided case in which it was held that property in a negative passed to the sitter, but he would adjourn his decision for a month to look up the case."

As two or three correspondents have written of late, asking if we could quote a case where, in Court, it had been definitely decided that the negative is the property of the photographer, we have been at some trouble to do so, though we are aware that we are not quoting all.

*Pedro v. Deane*, tried in the Bloomsbury Court, July 24, 1876 (see p. 359 of our volume for that year). Photographer sued for thirty shillings, price of a dozen cabinet portraits. Claim resisted because the negative was not given up. Judgment for the photographer for the full amount claimed and costs.

*Dixon v. Ward*, tried in the same Court, July 23, 1880 (see p. 372 of the JOURNAL for that year). The claim was for 4*l.*, being the value of two proofs and of the negative itself of a pianist he was instructed to photograph. Claim resisted as being excessive. Judgment entered for the plaintiff, His Honour remarking that the defence set up could not be maintained, for the negative of a picture was the most valuable property in it, as by it the defendant could have any copies printed by another photographer.

*Andrews v. Capper*, tried in the Swansea County Court, March 21, 1884 (see p. 202 of the volume for that year, also comments on the case, p. 210). In this case the claim was for 5*l.* 8*s.* 6*d.* for photographing a vessel, and 5*l.* 3*s.* for the copies supplied. The defendant paid for the copies, but resisted the claim for the former sum unless the negatives were handed over to him. Judgment for the plaintiff with costs. In his remarks the Judge said, "If you order a photograph, unless you make special terms for the purchase of a negative, the photographer is not entitled to give it up." The defendant's counsel asked, if a photographer charged him for taking a negative, did it not belong to him? The Judge replied, "No; it is part of the instruments used in the business. It is what the photographer uses in his business to make photographs. Why should he part with the instruments of his trade? A negative may be a secret in his trade."

*Theobald v. Thomas*, tried in the Brentford County Court,

in February 1895 (see p. 114 of our volume for that year). Facts: Messrs. Theobald & Co. were in the practice of sending specially drawn subjects and prints to the defendants to copy and make lantern slides from. Eventually the Messrs. Thomas sold their business, with the negatives, to Mr. Tyler, and Messrs. Theobald had to pay that gentleman 11*l.* 1*s.* 5*d.* to obtain the negatives, which they alleged were their property. That sum the plaintiffs sued the defendants for, together with 6*l.* damages for the loss of sale of slides. In the result the Judge, after hearing witnesses as to the custom of trade in photography, found for the defendants on all the issues, with costs, adding "that he failed to find that there was any custom in plaintiffs' trade different to that in the general photographic trade, where the negatives are held by the photographer though he could not use them as he chose." It will be noted that in this case the plaintiffs proceeded against the one who took the negatives, instead of, as in the Yarmouth case reported last week, against the one who purchased them.

The Edwards' case, tried in the Lambeth County Court, March, 1896 (see THE BRITISH JOURNAL OF PHOTOGRAPHY, p. 194, for the volume of 1896). In this case the late Mr. Edwards was sued by a monumental mason for damages for the detention of eighteen photographic negatives. The negatives, it appeared, were taken in the ordinary course of business, and the plaintiff contended that they were included in the charges and were his property. But the Judge (Judge Emden) said that "there is a decisive case on this very matter, and he well remembered it, as he was counsel in the case, and by the decision the photographer was held to be the owner of the negative." Judge Emden also said "that there was no evidence that there was a special contract, or that the negatives were specially paid for," adding that, "if the plaintiff's solicitor's contention was right, a person sitting for portraits should be entitled to the negative." In the end the judgment was for Mr. Edwards, with costs. On the question of appeal the Judge made the significant remark "that the plaintiffs should take time to consider the matter."

Although the cases cited above are only County Court ones, they stand as precedents, and confirm the fact that the negative is undoubtedly the property of the photographer, unless there is a special contract to the contrary. There is also a case (*Pollard v. The Photographic Company*, 1888), tried in a superior Court—the Chancery Court—before Mr. Justice North, as confirming the fact that the negative belongs to the photographer. In this case there was no question raised as to who the negative belonged to, but whether the photographer was entitled to use it, except to the order of the sitter. Mr. Justice North, in giving judgment, appeared to fully recognise that the negative was the property of the photographer, for in his ruling he said that the arrangement between the customer and photographer included by implication that portraits taken from the negative should be appropriated to the customer only. He granted an injunction to restrain further use, with costs.

It will now be interesting to see what will be the decision in the Yarmouth County Court case.

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**Technical Education.**—Reference is frequently made in the English press to the advantage that our German cousins possess in the way of technical education, and it has also been referred to in these columns when different technical schools have been opened here. There is no question that, up to quite recently, tech-



nical education, including photography, has been much neglected, but now it is receiving more attention. The report of the Technical Education Department just issued shows that the amount spent on technical education in London during the September quarter was 24,897*l.*—about 100,000*l.* a year for London alone—a goodly sum, it must be admitted. But the point for consideration is this, Is the amount of really practical education imparted equivalent to that obtained in Germany for a like sum or for a far less amount? The sum expended in such matters as education must not be taken to represent, at least in this country, the value received; still, it shows that the subject is receiving attention, and that is some satisfaction.

**X Rays on the Battlefield.**—It will be remembered that last week we commented in *Ex Cathedra* on the absence of the Röntgen-ray apparatus in previous campaigns, and on the replies given when questions on the subject were asked "in the House." It is satisfactory now to learn that the apparatus is in actual use in the field though provided by the Natal Government. In the *Standard of Friday* last is a telegram, through Reuter's Special Service, dated Pietermaritzburg, November 15, which reads: "The Natal Government's Röntgen-ray apparatus is doing splendid work among the wounded here, in locating the position of bullets which it was impossible to find with less powerful apparatus." From this it is clear that the Natal Government were fully alive to the value of Röntgen's discovery, and are utilising it, and to its full advantage. It is to be hoped, and we believe it is the case, the Medical Corps now arriving at the seat of war are as fully equipped with the apparatus as the Natal men are, for there is no question as to its great value.

**A Wonderful Sight.**—A report which is going the round says there is a boy, aged eleven, in Massachusetts, who is endowed with a wonderful sight. It is asserted that this will penetrate substances in the same way as the X rays. His gift, so it is said, has made him very useful to doctors in cases of accident and other mishaps where it has been found necessary to examine the interior of a patient's body. It should be borne in mind, however, that this story comes from America, where they often have wonderful things. We have an idea that we have heard a similar tale before.

**Art Pictures in the Lantern.**—It may be remembered that a few years ago we suggested that some of the foreign houses who make a speciality of art reproductions—the old masters as well as modern pictures—would do well to issue lantern slides of them as well as paper pictures, and that they would probably command a large sale in this country, and in the States, where the lantern is more in evidence than it appears to be on the Continent. It is with pleasure that we now see that Messrs. Eyre & Spottiswoode have just announced that they have had prepared the following four lectures, illustrated with lantern slides: "Gems from the Galleries: an evening with the Masterpieces of the World's Art;" "Through Shot and Shell: an illustrated lecture of Nelson;" "The Romance of a Reign: Victoria, Queen and Empress;" "The Bible and the Monuments: Parallels to the Illustrations of the Bible Story." Last year Messrs. Braun & Co. announced that they were issuing some thousands of their well-known art reproductions as slides for the lantern, and we were glad to hear it.

**A Boon to Continental Tourists.**—Photographic tourists on the Continent often feel considerable anxiety as to how their packages of dry plates will be dealt with at the foreign Customs Houses, particularly if they do not speak the language of the country. They will now feel gratified that the London, Chatham, and Dover Railway Company, in conjunction with the Western of France Railway Company, have arranged with the French Customs officers at Victoria so that passengers *via* the Newhaven and Dieppe route may have their registered luggage cleared prior to their departure for France. This new convenience, it is expected, will

take effect in January next. The advantage of this arrangement is that the tourist may have his photographic paraphernalia examined and passed before he starts, so that it will not necessitate its examination at the French Customs, and of course it will only have to be again examined on his return here. This new regulation will relieve him of great anxiety, particularly, as we have just said, if he does not speak French.

**The Leonids.**—The celestial fireworks, as the Leonids are often termed, seem to have been a failure this time, though great preparation was made for viewing them as well as photographing them, and all through the weather. Oh, that Clerk of the Weather! In all countries the weather seems to have been generally unpropitious, according to telegrams from Vienna, Berlin, New York, &c. At Hamburg, however, 149 were counted, including fifteen of the first magnitude, which were photographed, and at the Yale Observatory about a dozen were photographed. With the object of viewing the Leonids from a height and photographing them, the Rev. J. M. Bacon, accompanied by his daughter and Mr. Spencer, the well-known aeronaut, ascended in a balloon from Newbury. They, however, had an unfortunate experience during the twelve hours the balloon was up, for part of the time the machine is reported not to have been under control. Finally it came to earth near Neath so suddenly that one of Miss Bacon's arms was fractured, and the reverend gentleman was considerably shaken. The balloon rose to 9000 feet, and a most perfect observation was made of the simultaneous setting of the moon and the rising of the sun.

#### TEACHINGS OF DAGUERRETYPE.

THE TRAILL TAYLOR MEMORIAL LECTURE.—No. II., 1899.

WHEN I had the great honour of being invited by the Committee of the Traill Taylor Memorial to deliver the second of the series of Memorial Lectures, it became a question what subject I could best deal with and would be most appropriate.

Three presented themselves:—

1. "The Evolution of the Process Block," which was a subject in which our lamented friend, Mr. Traill Taylor, took himself a deep personal interest.
2. "The Relationship of Colour to Sensitiveness," which would have dealt with colour photography.
3. "Teachings of the Daguerreotype," which is the subject selected by the Committee for the present lecture.

The first lecture, given by Mr. T. R. Dallmeyer, was connected with the optics of photography in relation to the lens, which is the first requirement in the practice of the art with the camera.

The second requirement is the sensitive plate, and I now propose to take you back to the consideration of the earliest sensitive photographic plates in which silver haloid compounds were used.

#### VALUE OF DAGUERRETYPE AS A TEACHING PROCESS.

Although Daguerreotype has long been abandoned, it is capable of teaching us a good deal about the action of light on the silver haloid compounds which form the basis of our modern dry plates, as Professor Meldola has pointed out in his *Chemistry of Photography*. It may therefore well form the starting point of lectures in the present series, dealing with photographic processes based on salts of silver.

Daguerreotype was for a long time considered a unique and perfectly special process without any intimate connexion with the ordinary photographic processes, and, of course, so long as mercury alone was used for the development of the invisible image on the silver plates, it was so to a very great extent. Carey Lea was among the first to show that this view is erroneous, and that the Daguerreotype image is subject to the same laws as govern the wet-collodion and other processes for making negatives. Last year I was able to go further in this direction and show that Daguerreotype plates could be developed in a practical way by the ordinary acid ferrous sulphate and silver, or acid pyrogallol and silver used for wet-collodion plates, as well as with ordinary dry-plate developers, though in this latter case only faint negative images were produced. I also showed that the sensitive surface of iodised or bromo-iodised silver could be rendered more sensitive by treatment with suitable organifiers or halogen absorbents, such as tannin and similar bodies, as in the old dry-collodion processes, and that they could be rendered orthochromatic or colour-sensitive by treatment with suitable dyes, like collodion or gelatine plates. The process may therefore be looked upon as an epitome of the photo-plate, and from this point of view is of special value, because it depends upon the employment of haloid salts of silver formed by the direct union of the halogen and the metal, and therefore in their most



simple and purest forms as regards freedom from organic mixtures and complications.

This being the case, we ought to be able to derive a good deal of valuable information from a careful investigation of this process in its various stages and modifications with different halogens or combinations of them, and with different methods of developing and dissolving away the images formed by the action of light. From such an examination I think we ought to be able to obtain fuller knowledge of the probable nature and method of formation of the invisible developable image; and, even if we do not succeed in this, we may, at any rate, acquire information which may be of use in future investigations. The subject is one of considerable difficulty, and one which I feel requires very much fuller special knowledge and more time and attention than I have been able to bestow upon it. In fact, I have only been able to carry out a small part of the programme I sketched out above.

#### DESCRIPTION OF DAGUERRETYPE.

For the benefit of those among you who may not know how Daguerreotypes are produced, it may be briefly stated that a very highly polished surface of silver, either alone or plated on copper, is made sensitive to light by exposure to the fumes of iodine and bromine, with or without an admixture of chlorine. After a suitable exposure in the camera, which, even at its best, is very considerably longer than is necessary with a gelatine plate of ordinary rapidity, the plate is exposed to the warm vapour of mercury, which condenses and attaches itself only to those parts upon which the light has acted, and in proportion to the intensity of the action and the length of exposure, up to a certain limit. In this way an image is obtained in which the lights are formed by a white, powdery amalgam of silver and mercury, while the shadows are formed by the highly polished silver surface, which appears black in contrast with the whiteness of the amalgam when held in a suitable light. This effect is heightened by the process of gilding, which at the same time fixes the powdery image to the plate and makes it less susceptible of injury.

I have here some very beautiful specimens of Daguerreotypes, taken many years ago in the Crystal Palace, by the late Mr. C. Matheson, and presented to the Royal Photographic Society by Messrs. Negretti & Zambra. They will give you a good idea of the results obtainable.

It is not necessary, at any rate for experimental purposes, to use silvered copper plates. Glass silvered by the ordinary silvering processes answers very well for most purposes, and is cheap and readily obtainable. It can easily be polished with a little rouge or *well-washed* tripoli powder, on a chamois leather pad, but, in cases where the surface was rather rough and resisted the rouge, the polishing paste known as "Globe Polish" has given me good results. It is applied with soft cotton or cotton-wool. The objection to it is the greasiness, but this can be removed by polishing off with dry precipitated chalk. Instructive results can also be obtained, even more simply, on silver leaf laid down on glass plates coated with a clear crystal varnish. Specimens of results on all such plates are before you.

The first thing that strikes us in Daguerreotype is that the sensitive surface of the plate is formed by the direct combination of halogens, iodine, bromine, or chlorine, generally the first two, and sometimes all three together, with the metallic silver coating of the plate. The question arises, therefore, to which of these elements is the sensitiveness due? To the silver? to the halogens? or specially to the combinations? and how is it brought about?

#### SENSITIVENESS OF SILVER TO LIGHT.

I can find very little recorded about the sensitiveness of metallic silver to light beyond the fact that Moser found that silver, in common with most other metals, was sensitive to light. He exposed a silver plate for some hours in weak sunlight under a dark out-of-focus screen which was not in contact with it, and when the plate, which showed no change, had been allowed to cool, it was exposed to the vapour of mercury at about 170° Fahr. A clear image of the screen was produced, those parts where the light had acted had caused the deposition of a quantity of mercury. Plates of dark mirror glass and copper treated in the same manner showed the same result.

The series of phenomena which were dealt with in Moser's researches, especially those connected with the production of contact images, are, however, so peculiar in their results that it is still difficult to know to what cause they are really due. They have generally been attributed either to some impurity of the surface itself, to vapours given off by it, or to thin films of air or other substances in contact with it or otherwise affecting it. Robert Hunt was of opinion that many of Moser's effects were due to heat or thermic radiations.

In discussing the contact phenomena, the discovery of the sensitiveness of silver to light, as shown by the experiment described, has been overlooked, but I have been able to verify it, and, in addition, to obtain a visible printed-out image on the plain silver plate without any previous preparation—as you will see—also on silvered glass plates. In both cases the light seems to exercise a bleaching action, i.e., the exposed parts appear lighter than the unexposed and attract the vapour of mercury. By other experiments as to the electrical behaviour of silver partly exposed to light and partly unexposed, both in the dry state and immersed in water and other liquids, I have found that silver, though not very sensitive, does show undoubted sensitiveness, and it is also shown

by the change of colour of silver deposited on the cathode plate of a cell through which an electric current has been passed.

Carey Lea found that the three forms of allotropic silver he obtained, viz.:—A, the red soluble; B, the dark brown or blue insoluble variety; and C, the golden coloured, were acted on by light. A and B became brown after some hours' exposure, but with C the colour became lighter. This last result is similar to some of my own observations.

The oxides of silver are all sensitive to light and are decomposed by it. According to Hunt they lose oxygen by exposure, being first converted into a suboxide and then into metallic silver. In presence of organic matter the reduction is more complete.

#### HYDROGEN PEROXIDE A SENSITISER FOR SILVER.

I have also obtained some very interesting results with silvered glass plates fumed with peroxide of hydrogen before exposure, and find that it is capable of acting somewhat in the same way as iodine in sensitising the plate.

Mendeléeff remarks that the nearest approach to the properties of hydrogen peroxide is afforded by a non-metallic element—chlorine; its action on colouring matters, its capacity for oxidising and for evolving oxygen from many oxides is analogous to that exhibited by hydrogen peroxide. I do not know to what extent this similarity of hydrogen peroxide to chlorine extends to the other halogens, but the fact that there is such a relation, and that we find that hydrogen peroxide can act as a sensitiser to silver seems worth noting for further inquiry. I have here three plates, one sensitised by fuming with peroxide of hydrogen, another with chlorine, and the third with iodine; the results, after exposure to light and development with mercury, are practically the same on all three.

In the case of the Daguerreotype, as in other photographic processes with silver compounds, the sensitiveness of silver itself to light has hitherto not been regarded as in any way an essential factor in producing the results, which are usually attributed to the action of light upon the haloid compounds. It is, however, certainly of interest to know that it is sensitive, and even visibly so, and that images can be produced upon it by the action of light, which may be developed by condensation of mercury vapour, or by the precipitation of molecular silver with an ordinary acid iron and silver developing solution. As a matter of fact, nearly all the photographic phenomena, such as the development of an invisible image, the production of a visible image, reversal by over-exposure, and the effects of pressure in producing a developable image can be shown on the plain silver plate.

A further investigation into the nature of these images would be very interesting, and might show that the part played by the silver is a more important one than is usually assigned to it, and that this is the case seems to be shown by some of the results obtained in printing out on the iodised Daguerreotype plates.

#### PROPERTIES OF THE HALOGENS.

We now come to the halogens generally used in combination with silver. Though not very sensitive to light in the pure form, chlorine, iodine, and bromine are so when combined with other substances. They are all marked by their strong affinity for hydrogen, and to this is probably due the ready decomposition of substances containing them when exposed to light in presence of water or organic substances containing hydrogen. Compounds of chlorine are the most readily decomposed in presence of hydrogen, then those of bromine, and lastly those of iodine.

Chlorine may be combined directly with hydrogen under the action of light, but not iodine. Bromine and hydrogen combine under the influence of light at 196° C., and form hydrobromic acid. Watery solutions of chlorine and bromine are decomposed by light with formation of the corresponding hydrogen acids. A watery solution of iodine is not decomposed by light, but a solution in alcohol is so to a slight extent. The blue iodide of starch is distinctly sensitive to light.

The relation of the halogens to hydrogen is the reverse of their relations to oxygen, for which iodine has a much greater affinity than chlorine, while bromine occupies an intermediate position. In presence of water iodine can act as an oxidiser, but has very little bleaching power. Iodine, however, does not combine with oxygen under the influence of sunlight, either in presence or absence of water. There is no combination either between bromine and chlorine with oxygen in sunlight. It may be noted also that oxygen is not converted into ozone by the action of sunlight.

According to Mendeléeff (English translation, 5th edition, I. 465), under the influence of light chlorine is able to replace hydrogen by virtue of an action termed *metalepsis*, which is always accompanied by the formation of hydrochloric acid. In the dark chlorine does not usually act on hydrogen compounds, but the action commences under the influence of light. The direct action of the sun's rays is particularly propitious to it. It is also remarkable that the presence of traces of iodine added to the substance subjected to *metalepsis* often produces the same effect as sunlight. This action may be due to the formation of iodine chloride, which reacts more easily than chlorine. Bromine and iodine possess the same properties. Iodine itself, however, does not act by *metalepsis* on hydrocarbons on account of the easy decomposability of hydriodic acid, especially under the influence of light.



As not only their oxygen compounds, but also their hydrogen compounds, have acid properties, the halogens are elements of an exclusively acid character. This character is more strongly developed in them than in any other elements. This acid character of the halogens is very distinctly marked in all photographic processes.

Robert Hunt says of them (*Researches on Light*, p. 279): "Chlorine, iodine, and bromine, it is well known, act with considerable energy upon metallic bodies. If, however, any polished metal is exposed to the action of them in a diluted state, the combination is at first exceedingly small, and the films that are formed by either of these three elementary bodies upon any metal undergo considerable change under the influence of the sun. In most cases it appears that these bodies are set free, and the metal left in a state of very fine division or oxidation. Copper, tin, iron, zinc, lead, pewter, bismuth, and several other metals have afforded the same results. It is still more remarkable that films of bromine or iodine on glass are found under the action of the sun to act in a similar manner."

#### COMBINATIONS OF HALOGENS WITH SILVER.

According to Mendeleeff, silver gives insoluble and exceedingly stable compounds with the halogens. They are obtained by double decomposition with great facility whenever a silver salt comes into contact with halogen salts. (As I lately showed, this combination takes place even with dry powdered salts.) The degree of affinity of silver for iodine is greater than that for chlorine or bromine, so that, when exposed to light, the iodide does not part with its iodine as the chloride and bromide do with a portion of their chlorine and bromine.

Beketoff has explained the fact that silver iodide is more stable than the chloride or oxide by an original hypothesis—that the most stable compounds are those in which the weights of the combined substances are equal. Thus silver oxide is less stable than the chloride, and the iodide is the most stable.

Silver iodide is also more stable in respect to the action of light than silver chloride. Silver chloride quickly darkens, and appears to be decomposed into chlorine and silver. Silver bromide and iodide are much more slowly acted on by light, and, according to certain observations, when pure they are quite unacted on—at least, they do not change in weight; so that, if they are acted on by light, the change they undergo must be one of a change in structure of their parts, and not of decomposition, as it is in silver chloride. Silver iodide in presence of a large excess of silver, as in the Daguerreotype plate, darkens as readily as the chloride does when exposed with excess of silver nitrate.

As a combination of silver with iodine vapour forms the basis of the sensitive surface of the Daguerreotype plate, we may first of all consider it.

#### SILVER IODIDE.

Silver iodide is usually formed by precipitation from mixtures of solutions of silver nitrate and potassium or other metallic iodide. According as the silver or iodine is in excess, it has either a full yellow colour and is slightly darkened by light, or a very pale yellow colour, almost white, and is scarcely changed in colour by light.

We are, however, more interested in the comparatively little known forms of anhydrous iodide produced by the direct union of silver and iodine, and generally in immediate contact with metallic silver.

Before proceeding to consider the composition and behaviour under the influence of light of the sensitive surface of silver iodide on the Daguerreotype plate, it may be as well to examine the action of iodine upon silver in a very fine state of division. This can be readily done by adding iodine in various proportions to precipitated silver, and the resulting mixtures are more easily tested with various reagents than can be done on a plate.

Unless the iodine is in a very small proportion compared with the silver powder, the two may combine with a sudden rise of temperature and flame, the iodine vapourising and going off in violet fumes. The iodine must therefore be added only a little at a time, and be kept constantly stirred. In this way the full quantity required to produce the iodide, AgI, may be added.

Mixing precipitated silver thus with iodine in different proportions, such as 108 parts by weight of silver to 12.7, 37.1, 63.5, 95.2, and 127 parts by weight of iodine, we obtain a series of powders varying in colour from a grey or chocolate brown to an olive yellow, and finally brick-red tint. This last was shown by the preparation containing 108 parts of silver to 127 of iodine. It still contained a quantity of uncombined iodine as well as some uncombined silver inside the grains, but, if left in the air for a short time the excess of iodine evaporated and the powder turned to a deep orange yellow.

All the lower compounds are readily blackened by light, but the higher ones, with 63.5 parts of iodine (subiodide, Ag<sub>2</sub>I, (?) and upwards, are not so visibly blackened, and with the full quantity of silver and iodine to form the iodide (AgI) the mixture does not blacken at all in the light, just in the same way as the ordinary yellow iodide prepared by precipitation is not blackened.

This shows that the darkening is a function of the silver, increasing with the excess of silver and diminishing or entirely disappearing with excess of iodine.

If, however, we add precipitated silver to iodine, the yellow iodide is not formed at all, even when the full combining proportion of silver is added. This seems to be due to the iodine forming a coating on the silver grains which stops further action. The resulting compound is of a dark brown

colour with no grains of yellow iodide, as is the case when the iodine is added to excess of silver. By leaving the brown mixture till the excess of iodine has gone we obtain the same brick-red compound, which becomes yellowish on further exposure to the air. If more silver be added to take up the excess of iodine, the lower compounds are formed. I have not been able to very closely examine these curious compounds or mixtures of silver and iodine, but they seem worth further investigation.

There is one curious fact connected with the darkening of these mixtures or lower iodides which has already been noted, and that is that there is no loss of weight after exposure to light. Iodine is not set free, as is the case with chlorine or bromine, and it is difficult to know what the action really is, and whether there is any chemical decomposition by catalysis or otherwise, or whether the change is only structural. Recent researches by H. Scholl, to which attention will be drawn further on, seem to throw considerable light upon this question.

#### COMPOSITION OF THE SENSITIVE SURFACE OF THE DAGUERRETYPE PLATE.

That the sensitive surface of the Daguerreotype plate is formed by one of these lower compounds of silver and iodine, and not of the pure iodide, AgI, is, I think, shown by the fact that, if we iodise a thin film of silver leaf or silver on glass till all the silver has combined with iodine, we obtain an almost transparent pale yellow film, which no longer darkens very visibly even in bright sunshine, and is very insensitive, requiring long exposures to produce even the developable image. If, however, we expose a fairly thick plate of silver for several hours to the fumes of iodine, this yellow iodide is not formed at all, and we have instead a dark brownish or olive-coloured deposit, which is readily darkened by light, just as the iodised silver mixtures were, and as the Daguerreotype plate is. Some of this darkened deposit, treated with potassium iodide partly dissolved, the remainder still retaining its blackness; the addition of distilled water turned it yellow, the further addition of KI further dissolved it, but still left a dark purplish precipitate, which, being treated with nitric acid, behaved exactly like the original unexposed deposit, evolving iodine. HCl gave no precipitate of silver chloride, and therefore free metallic silver could not have been present.

Hence the surface of the Daguerreotype plate may be looked upon as iodised silver, or a compound containing a very small proportion of iodine in more or less loose combination with a large excess of silver. On exposure to light no iodine is set free or lost, but compounds are formed at the surface containing a larger proportion of silver, and therefore darkening more readily up to a certain limit, while the iodine penetrates more deeply, and attacks the underlying silver surfaces. That this is the case is shown by the fact reported by Moser, and also by Robert Hunt, that the darkened surface of an exposed Daguerreotype plate may be removed several times over, and still the under surface will remain sensitive. I have myself done this fifteen times over without exhausting the iodine or entirely destroying the printed-out image first impressed on the plate, and it was very remarkable how this original image came up apart from the ground after each exposure, which was taken up to solarisation point or beyond.

If, however, the proportion of silver to iodine is normal or in defect, and we have the anhydrous yellow iodide or orange super-iodide formed, we find that it does not darken in light, or only becomes a deeper yellow. A sample of pure yellow iodide, which was obtained from a well-known firm, shows this effect very distinctly on exposure to strong sunlight, but it loses this deeper colour again in the dark, becoming once more a pale lemon yellow.

Professor Meldola has suggested that the silver iodide on the Daguerreotype plate forms its own sensitiser, and from what I have seen of the deepening in colour of the above samples of iodide and others under the influence of light, or when treated with an excess of iodine, I have little doubt that this is the case. As we shall see later on, iodine may even exert an active sensitising action upon pure silver iodide.

#### TALBOT'S IODINE RINGS.

One of the most striking points with regard to the action of iodine on a polished silver plate is the series of interference colours it produces, in accordance with the thickness or varying composition of the film of iodide produced, and I cannot do better than show you an old experiment which was first tried by Fox Talbot, and described in the *Athenæum* for 1839, p. 643, also in Hunt's *Researches on Light*, p. 102. If we place a small crystal of iodine on a polished silver plate or a silvered glass, and warm it gently with a spirit lamp, we shall at once see a series of about seven sets of concentric rings, forming prismatic or interference colours exactly similar to those of Newton's rings, or rather Nobili's rings, which are Newton's rings reversed. First, outside we have a bright yellow, and within this there arise successively rings of green, red, and blue, and then again a fine yellow circle, centered by a greyish spot on the place occupied by the iodine. Now, if we cover up one-half of the series of coloured rings and take the plate into the sunshine, we shall see one of the most striking and beautiful exemplifications of the action of light it is possible to conceive. The rings are sensitive to light, their colours change and become intensified, producing quite a new series of rich prismatic tints, which completely illustrate and prove the fact I have just drawn your attention to, that darkening increases in proportion to the excess of silver, and lessens with the increase of iodine. The outer circle, which before exposure was only a pale rose colour (the most sensitive iodide colour), is now a deep brilliant green shading into a



strong reddish-violet, and then into beautiful dark blue, succeeded by a broad white or very pale green merging into a deep yellow, succeeded by a series of fine well-marked concentric rings of much the same tint as the original unexposed rings, but deeper and brighter. The tints vary somewhat according to the length of exposure. The outer rings produced by the thinnest stratum of iodised silver, furthest from the centre, must be in a very loose state of chemical aggregation. Talbot says the coloured rings seem to consist of silver iodide in various stages of development. If we turn the plates downwards at an angle of 45° to the light, we shall see that the colours are reversed and show complementary tints.

There is another method, due, I believe, to Wiener, by which these colours can be shown, and almost more brilliantly, by resting the plate on a glass cylinder while being iodised. This produces a double set of coloured bands, one on each side of the central blank space, as you will see. Viewed by reflected light, the complementary colours are very rich and almost fluorescent in their luminous intensity.

These gorgeous tints do not, however, represent any distinct chemical change in the composition of the sensitive surface beyond the production of films of iodised silver of varying thickness; and, if after exposure to light we submit the plate to the fumes of mercury vapour, or treat it with an acid iron and silver developer, we shall get no distinct image of the series of rings, but only two or three bands or regions of increased or diminished sensitiveness. With short exposures these bands are fairly distinct, as you will see from the example I have with me. The same result is obtained with images simply fixed with hyposulphite of soda. The outermost rings show an increase of action which is succeeded in the broad bluish or greenish-white band by a decrease, the action increasing again towards the central series of rings. The behaviour of these coloured rings under coloured glasses will be noticed further on.

#### RELATIVE SENSITIVENESS OF TINTS PRODUCED BY IODISING.

The relative sensitiveness of the various tints produced on the surface of a Daguerreotype plate by the vapour of iodine was first studied by Professor J. W. Draper, of New York, and his results are recorded in a paper published in the *L.D.E. Phil. Mag.* for September, 1841. He found that the plate passed through the following stages of colour:—

1, lemon yellow; 2, golden yellow; 3, reddish yellow; 4, blue; 5, lavender; 6, metallic; 7, yellow; 8, reddish; 9, green, &c., the differences of colour being produced by the differences of thickness in the film of iodide, and not by any difference of chemical composition.

Talbot's rings show this fairly clearly. The outer rings are coloured much as stated by Draper, then comes the strong second yellow, followed by red and green, and, as the iodine acts longer and produces a thicker film, the rings become closer and darker as well as less sensitive to light. I find, however, that they attract mercury vapour readily, after exposure.

Having prepared nine plates showing the different tints above indicated, Draper exposed them under uniform conditions to the light of a gas flame, and found that No. 1 showed a well-marked action; No. 2, still stronger; but that the rays had less and less influence down to No. 6 (metallic), in which they appeared to be almost without action: but, in No. 7 (second yellow), they had recovered their original power, being as energetic as in No. 2; and from that they declined again.

Hence, as Draper says, we see that the sensitiveness of the iodide of silver is by no means constant; that it observes periodical changes, depending on the optical qualities of the film, and not on its optical composition; that by bringing the iodide into those circumstances that it reflects the blue rays, we greatly reduce its sensitiveness, and still more so when we adjust its thickness so as to give it a grey, metallic aspect; but the moment we go beyond this and restore by an increased thickness its original yellow colour, we restore also its sensitiveness.

Upon this and other observations, Draper, so early as 1841, laid down, among others, two important propositions upon which all photographic action is based:—

"That the chemical action produced by the rays of light depends upon the absorption of those rays by sensitive bodies, just as an increase of temperature is produced by the absorption of those of heat.

"That the sensitiveness of any given substance depends on its chemical nature and optical qualities conjointly, and that it is possible to exalt or diminish the sensitiveness of any chemical compound by changing the character of its optical relations."

The first of these propositions has been termed by Professor Meldola *Draper's law*.

The practical application and extension of this principle led the late Dr. H. W. Vogel to the discovery of the modern system of orthochromatic photography, and by applying suitable dyes, or, as he called them, *optical sensitizers*, to the ordinary photographic dry plates, he found that they could be rendered sensitive to the rays at the less refrangible end of the spectrum for which they are ordinarily insensitive. I cannot, at present, go further into this question, but it is important to note that this most important discovery was based to some extent upon Draper's observations of the different degrees of sensitiveness produced on Daguerreotype plates, according as the colour of the sensitive surface of silver iodide affected its absorption of the rays of light.

#### DEVELOPING ACTION OF RED AND YELLOW LIGHT.

One of the most curious and remarkable phenomena connected with

the early working of Daguerreotype plates is the action of red or yellow light upon the images formed either in the camera or by printing out. Thus, if we give a short normal exposure to an iodised silver plate, and instead of developing it in the ordinary way by the vapour of mercury or by treating it with an acid, iron, and silver developer, we expose it in the sun under a red glass from fifteen to twenty minutes, we shall find to our astonishment a completely printed-out image, containing quite as much, if not more, detail than would have been shown by the deposited mercury or silver, while the protected parts originally unaffected by the light, remain perfectly unchanged, and, on fixing with hyposulphite of soda, retain all their original brilliancy and clearness, as you will see. The curious thing is that the iodised silver coating shows itself quite insensitive to the action of light passing through the same red glass which, after even the faintest action of white light has affected the sensitive surface, will continue the action and carry it to full intensity, and even on to bronzing or solarisation.

This phenomenon seems to have been first discovered by Ed. Becquerel when working with the spectrum. He found that if an iodised silver plate were exposed to the spectrum it was not sensitive beyond a point more than half way between c and f; but if the plate had previously received a short exposure to light, it was then sensitive to the whole length of the spectrum up to r, and from this point to beyond a there were signs of reversal or destruction of the image. Becquerel, therefore, called the rays at the most refrangible end of the spectrum the *rayons excitateurs*, while those at the less refrangible end he called *rayons continuatateurs*.

Shortly afterwards Gaudin succeeded in developing an image as perfect as that produced by mercury by submitting the plate when taken from the camera to the action of light under a yellow glass and without any subsequent exposure to mercury.

Claudet, Hunt, and others also investigated this curious phenomenon, and a good many explanations were put forward regarding it, but the one given by Bunsen and Roscoe in their paper "On the Phenomena of Photo-chemical Induction," in the *Phil. Trans. Roy. Soc.*, 1859, p. 400, whether correct or not is interesting in other respects. As it is not generally known, it may be worth quoting from the original, because it seems to have a distinct and important bearing upon other obscure phenomena connected with the formation of the invisible developable image on photographic plates of all kinds.

#### PHOTO-CHEMICAL INDUCTION.

By photo-chemical induction the authors mean the act by which the resistance to chemical combination of different bodies is diminished by the active agency of light.

"The laws of photo-chemical induction which we have here developed, explain most completely many of the singular phenomena which lie at the foundation of the photographic processes. Without entering into detail concerning the relations which these laws bear to the general processes of the photographer, we will now merely consider one phenomenon which has been so difficult to explain, that it has been found necessary to assume the existence of certain rays endowed with very peculiar properties, to which the name of *rayons continuatateurs* has been given. This phenomenon was first established by Edmond Becquerel from the following observations. If one-half of an iodised plate of silver or a sensitive photographic paper be protected from the action of light whilst the other half is exposed to a constant source of light for such a time that no alteration, either perceptible to the eye or capable of being developed by photographic preparations, is effected on the sensitive surface, the plate possesses the property, when exposed to a uniform but very slight amount of light, to blacken on the insulated half, whilst the part not previously exposed remains unaffected. If, in the first short insolation, every part of the plate was not exposed to the same intensity of light, the blackening effected by the following uniform exposure corresponds to this intensity, so accurately, indeed, that a Daguerreotype picture commenced by this slight exposure may be developed by subsequent uniform insolation, almost as perfectly as if each amount of light represented on the picture, and not a constant amount, had acted for the whole time upon the plate. The explanation of this fact does not require the assumption of a new class of rays, which cannot commence, but only continue, the photo-chemical action. The phenomenon is in reality a simple consequence of the laws of photo-chemical induction, and proves that these relations, which we have examined only in the case of chlorine and hydrogen, occur in a slightly modified form in other photo-chemical processes. If the chlorine and hydrogen mixture were a solid substance which could be fixed upon paper without diminishing its sensibility to light, this paper must exhibit exactly the same singular property which Becquerel first observed with the Daguerreotype plate, or other photo-chemically sensitive surface."

They then prove this by examples taken from their actual experiments.

In the first case, if it takes, say, five minutes before any chemical decomposition of the sensitive surface is effected, and a plate has one-half protected from light and the other half exposed for five minutes, although both parts show no visible action, the exposed half has five minutes' start, and if the whole plate be now exposed to uniform insolation, the half previously exposed will act quite differently from the half which remained in the dark.

The exposed half begins darkening at once, gaining intensity every



minute, while the unexposed half must remain for five minutes before any darkening action can take place.

The second case is similar. An image commenced by lights of various degrees of intensity is developed by a subsequent uniform exposure in depths of colouring proportional to the original varying intensities. The same thing happens if "the sensibility of the plate is altered by the first exposure to light, and in such a manner that the greater luminous intensity corresponds to the greatest sensibility. If the varying amounts of sensibility which the surface of the plate has reached by the first exposure could be represented by depths of colouring, the various shades would represent the picture itself. With a subsequent uniform insolation, the chemical action must therefore proceed proportionally to the various amounts of light in the original picture, and, if the chemical action is made visible by a change of colour, an actual picture must be produced."

Dr. Vogel has explained this phenomenon, in a very simple manner, by the supposition that during the preliminary exposure a sub-salt is formed which changes the absorptive properties of the surface and renders it sensitive to red and yellow rays.

Iodised silver plates show this phenomenon quite distinctly with deep red, yellow, or cathedral green glasses. For instance, a plate had two exposures under a graduated screen: first, a short one showing no visible image; the second, printed out to show up to 3 or 4 of the scale of 7 gradations. After some twenty minutes' exposure under the red glass, the first exposure showed a clear printed-out image up to 3 or 4 of the scale, similar to that produced by the second printed-out exposure, while this last image was fully printed out and extended under the influence of the red glass up to 7, or the full extent of the scale, the original numbers 0 to 3 being strongly bronzed, just as they would have been by a longer exposure to white light. They had, apparently, been iodised.

In the same way, an iodised silver plate exposed in white light under a scale of fifteen coloured glasses, and only showing visible action under the blue and lavender glasses, when further exposed under a red glass, showed action under all the blues and violets and bluish-greens, but not under the reds, yellows, and yellowish-greens at all, though this developing action was going on under a red glass.

Yellow and green glasses gave much the same effect. Violet glasses, either reddish or bluish in tint, did not answer at all—nor did blue glasses—the images already formed seemed to grow weaker instead of stronger, and they were removed entirely in fixing, leaving no trace.

The developing action of the red, orange, yellow, and green glasses may also be shown upon silver surfaces which have been treated with iodine, so as to show Talbot's rings, and, although there are no very marked changes in the chromatic relations of the different series of rings, there are changes which might repay further investigation. I have brought with me a series of plates illustrating the changes produced in these rings by exposure to white light, as well as to coloured light passing through glasses of various colours.

Under a red glass there is little perceptible change in the inner series of rings, but in the outer rings the blue, violet, purple, and red are almost absent, and their places taken by shades of mauve and dull green. The rings that were entirely unexposed show no change.

Under the orange glass the effect of the glass on the series of exposed rings is very similar to that produced by the red glass, but there is also a considerable developing action shown on the unexposed rings, and the scale of colouring is quite different to that shown by the exposure to white light. In the latter the outer rings are marked by a deep pansy-like bluish-purple fringed with green, while in the outer rings exposed under orange glass we have a fine, pure blue, fringed with purple, and shading out into brown.

The action of the yellow glass is similar to the orange; but, as the original exposure under white light was not carried to the green or solarisation stage, the contrast between that set of rings and those exposed under the yellow glass is not so marked, though there is a very distinct difference.

The effect of the cathedral green glass is very marked, especially in the outer rings, which show grades of pale mauve, blue, violet, and a rich bright green in the part originally exposed to white light, while the unexposed rings, though showing a considerable extension of action under the glass, are very similar to those exposed in white light, but show less red.

The blue glass shows a very marked effect, quite different to the glasses noted above. The exposed and unexposed series show practically the same effect under the blue glass, while the scale of colouring is markedly bluer, the outer rings being shown by shades of lavender or mauve working into blue-violet, and then into shades of rich blue-green, followed by a yellow-green, and then pink.

Efforts have, I believe, constantly been made to utilise this principle of after-exposure under a red glass in practical photographic work, especially in taking astronomical photographs, but the trouble is that it works best with rather insensitive plates or papers, and so there is not much saving of time. However, it might be of use in cases where large numbers of prints had to be produced from a single negative, and it would be an object to shorten the exposure required under the negative. The point to observe is that the first exposure must be sufficient to start the action in the under-exposed parts, and that the sensitive surface

must be almost insensitive to the rays coming through the coloured glass. The ordinary P.O.P. paper shows the effect well.

The fact fully brought out by Bunsen and Roscoe's researches on photo-chemical induction, but first observed by Draper, that the action of light upon a mixture of chlorine and hydrogen does not take place instantaneously, but that a considerable continuation of the exposure is necessary before an action occurs, has, I think, an important bearing upon the much-vexed question of the physical or chemical nature of the latent developable image on photographic plates.

Bunsen and Roscoe found that, if the chemical rays emanating from a constant source of light be allowed to fall upon a mixture of chlorine and hydrogen which has stood for some time in the dark, no appreciable quantity of hydrochloric acid is formed during the first few moments. After some time has elapsed, a small action is observed which very gradually increases, until after a considerable space of time a permanently constant maximum is obtained. The time which elapses from the first insolation until the first traces of the photo-chemical induction become visible, and until the maximum action is attained, is, according to circumstances, extremely different.

Bunsen and Roscoe also pointed out that in their experiments they had to do with the purest form of the phenomena which are classed under the name of catalysis, freed from all foreign disturbing causes.

These researches on the action of light upon a mixture of chlorine and hydrogen have been continued by Pringsheim (*Wied. Ann. Phys. u. Chem.*, N.S. 32, 1897), who found that photo-chemical induction is not dependent upon the colour of the light, but only upon its chemical intensity; and it seems probable that the photo-chemical induction is based upon chemical processes connected with the formation of hydrochloric acid gas, and not upon any peculiarity in the action of light. He found also that the first visible action of light upon the gaseous mixture of hydrogen and chlorine consisted in an abruptly increasing and an equally abruptly decreasing of the volume of the gas, the amount of which was proportional to the intensity of the light producing the action. This sudden increase in the volume is brought about by a momentary dissociation of the molecules which takes place at the moment of the chemical change. Scarcely any hydrochloric acid is formed, but rather an intermediate substance. The slow formation of this acid only takes place when the mixture of gases is moist; dry gas is not sensitive except in strong light. The intermediate product which produces photo-chemical induction, and the assumption of which is completely explained by this phenomenon, arises probably from the decomposition of watery vapour. This last observation seems to have considerable importance, as Nernst has shown.

I do not know whether any series of experiments have yet been made on the basis of these researches of Bunsen, and Roscoe, and Pringsheim with photographic plates. We know now that hydrogen is not a metal, as was at one time supposed, and therefore its relations with halogens might not be exactly comparable with those of silver and other metals forming light-sensitive compounds; but, from results I have obtained during the course of experiments with iodised silver plates, I believe that a carefully carried-out series of observations upon the action of light on plain silver surfaces, in combination with the halogens and mixtures of them, might yield very valuable information as to the mechanism of the latent developable image, and throw more light upon the composition of the products of reduction, which, though small in quantity, are in a form more easily amenable to chemical analysis than is the case with ordinary photographic plates prepared with collodion or gelatine.

Quite recently Dr. R. Luther has shown that, when silver is acted upon by small proportions of chlorine water added in stages, the oxidation potential, as shown by an electrometer, remained at first constant at 0.55 volt, but suddenly sprang to 1.45 volts as soon as half the silver had been combined with the chlorine corresponding to the sub-chloride  $\text{Ag}_2\text{Cl}$ . It then remained fairly constant at 1.45 volts until the whole of the silver had been converted into chloride. This action seems somewhat analogous to Pringsheim's observation of the sudden rise at the moment of chemical change between hydrogen and chlorine. Many of Bunsen and Roscoe's observations show similar sudden rises and gradual increase to a maximum.

It seems not unlikely, therefore, that for a certain time, which is variable, according to the nature of the sensitive surface and the intensity and character of the light, the action of light is physical or mechanical, and that the latent developable image is not formed till the moment when chemical decomposition begins and the stage of under-exposure is reached; a certain further period of action produces the stage of chemical decomposition, corresponding to normal exposure, and still further we reach the stages of the visible image, over-exposure and solarisation, which in some cases appears to be equivalent to electrical polarisation and reversal.

#### ACTION OF LIGHT UPON PURE SILVER IODIDE.

We now come to the question of the action of light upon a surface composed of pure silver iodide, such as may be obtained by completely converting the thin silver film of a silvered glass into iodide.

If we expose a piece of silvered glass to the fumes of iodine for about an hour and a half to two hours, till the silver coating is entirely converted into the anhydrous iodide, we obtain on almost transparent pale greenish-yellow film. According to some writers, this film of pur



iodide is absolutely insensitive to light, either visibly or by development. I have not found it so. Visible images may be obtained by exposure in daylight, or even in the camera.

As there is no active iodine absorbent present in the film, either free silver or its compounds or organic matter, the action of light on these plates would appear to be more of a physical or mechanical nature than chemical, though, as we shall see later on, there is a very strong probability that chemical actions play their part in a somewhat obscure way.

One of these plates was exposed in the camera for seventy-five minutes upon a view of sky and houses. There was no distinct visible image, but mercury vapour brought out a faint outline of the tops of the houses against the sky, the sky being darker than the houses, &c. There were no details. The plate was left in the mercury box in the hope of bringing up more, but the image gradually disappeared, and eventually did so completely, leaving absolutely no trace. The same thing happened, though not so completely, on another plate exposed in the same way, but showing a distinct visible image after exposure in the camera, and also developed with mercury. A similar vanishing of a developed image was also noticed on one of the silvered glass plates, which was exposed for some days from the glass side. There was no visible image on that side, but there was an image on the unexposed face of the glass, which could be brought out by breathing. On developing the plate with acid iron and silver, and forcing it a little, traces of the image were distinctly visible from the glass side of the film; but, after the film dried, all traces of the image had disappeared from that side as well as from the front. From these two instances there seems to be some ground for believing that photographic images may be produced by purely molecular action.

On exposing another of these super-iodised plates for five minutes in the sun under a screen of fifteen coloured glasses, I noticed that where the light acted through the blue, violet, and bluish-green glasses, the film appeared more or less opaque and clouded, whilst the edges of the plate, which were freely exposed to the sun the whole time, were only very slightly darkened or different to the unexposed ground. On developing with mercury the vapour was deposited on all the affected spaces under the coloured glasses, but not on the protected parts or the unaffected spaces under the red, yellow, and green glasses, nor on the over-exposed and solarised parts outside. Development with acid iron and silver gave precisely similar results, as you will see from these two plates. The images in both cases are rather thin.

This peculiar turbidity or opacity of the fully iodised silver film when exposed to light was noticed by Schultz-Sellac (*Photo. Mitth.*, 1871, p. 60; or *Photo News*, 1871, p. 308). He says that the action of light is sometimes shown by the production of a series of colours in the film when viewed by transmitted light, by refraction of the light through the particles of iodide of silver. I have not noticed these variations of colour.

He further says: "If different parts of a plate are exposed to the action of light for various periods, covering portions partially with an opaque shield, which is drawn away after certain fixed periods of time, it will be observed that the action is apparent only after the lapse of a certain time, and it suddenly increases with great rapidity. To start the action in the first instance, therefore, a certain amount of light is necessary." This, it seems to me, furnishes a practical corroboration of Bunsen and Roscoe's theory of photo-chemical induction, and may be compared also with Luther's recent observations, previously referred to.

According to Schultz-Sellac, the presence of a small quantity of free iodine is necessary to the occurrence of the mechanical change; by keeping some time in the air or by treatment with iodine absorbents, the sensitiveness of the material to mechanical change is annulled, but again restored by further fumigation with iodine. In my own experience I have not noticed any very marked difference of action between plates that have been left in the air before use or fresh ones still charged with iodine, though the latter are, I agree, more sensitive, i.e., more quickly affected by light than the former. If a plate has, however, been exposed to light in contact with an iodine absorbent—silver, copper, or tannin—then, although there is a decided darkening visible by transmitted light, the film does not become opaque.

If, again, as suggested by Schultz-Sellac, one of these over-iodised plates is partly coated with collodion or varnish, then we notice a very marked difference between the images produced on the varnished and unvarnished parts. This is very clearly shown in the prints of a graduated scale I have here. On the unvarnished half we have a strong series of pale whitish-yellow bands decreasing very distinctly in density, while on the varnished half, though exposed longer, the images of the bands, though visible, are all more or less phantoms. It must be noted, however, that the varnish is a strong iodine absorbent, which collodion might not be.

Schultz-Sellac found that somewhat similar effects could be produced with films of pure iodide of silver in collodion fumed with iodine. He attributes the changes of colour which are observed to a mechanical change in the particles, and not a chemical change.

In a paper published last June in *Wiedemann's Annalen*, H. Scholl has very fully investigated the changes produced by the action of light on silver iodide and Daguerreotype plates. In the third section he gives the results of his inquiries into the cause of this peculiar turbidity. He first shows that, as we have already seen, if the film of pure silver iodide pro-

duced as described is covered over by a coating of varnish, collodion, or some other suitable substance, the cloudiness is produced very much more slowly. This may be due either to the coating preventing the escape of iodine or the access of air. If any iodine is given off during exposure, we ought to be able to detect it by placing the iodised film in contact with a plain silvered glass surface. On doing this he found that there was some change on the silvered surface, but not more than could be observed by exposing the silver to a light of the same intensity, but not in presence of the silver iodide. There were no distinct interference colours, and he does not consider the experiment convincing.

I have tried this experiment several times in different ways, and find that the plain silver surface is very distinctly and even visibly affected by contact with the iodised plate during exposure, and certainly very much more so than if exposed by itself under the same circumstances. For instance, a slip of pure silver foil was exposed for fifteen minutes in the sun under one of these iodised silvered glass films, but separated from it by a cut-out screen of mica. The silver foil showed distinct images of the cut-out designs, which darkened still further when exposed to light, and were quite soluble in a solution of potassium iodide. The parts of the foil protected by the mica were quite unaffected. Similar results were obtained with polished copper and with paper soaked in tannin, the images in the latter case being brought out with weak aceto-nitrate of silver.

MAJOR-GENERAL J. WATERHOUSE, I.S.C.,

Hon. Secretary, Royal Photographic Society.

(To be continued.)

#### THE HACKNEY PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE Hackney Photographic Society held its Tenth Annual Exhibition at the Morley Hall, Hackney, on the 15th, 16th, and 17th inst.

In reviewing the successive Exhibitions of the Hackney Photographic Society, it has always been our pleasing duty to record an improvement in the work of the members. Last year we commented upon the comparative absence of photographs which bore the impress of being the beginners' early attempts, and the consequent higher average quality of the pictures as a whole; but, while progressing at more than the usual rate, the improvement was more marked in the work of the junior members than in that of the seniors. This year a distinct advance all along the line was evident. The strength of the Hackney Society has been hitherto in landscape work, and naturally, perhaps, the features of their most easily reached hunting ground, the flat districts of their adjoining county, seem to have had a great influence in the choice of subjects; but, however excellent the pictures may be individually, too much of any class of subject is apt to be depressing. We welcome, therefore, the greater variety which we found at the present Exhibition, both in the subjects and in the treatment of them. Until this year it would have been unkind to compare the work in the members' classes as a whole with that in the open classes, but now the Society need not fear the result of the comparison. It must be admitted, however, that the work in the open classes was not quite as interesting as usual. In architectural work the members have made wonderful strides during the year, or at least some of them have, for the class was not a large one. The portraiture and figure studies showed improvement, but not to the same extent. We regretted to find that the separate class for hand-camera work was retained. There may be something to be said in favour of dividing an Exhibition into classes according to subjects; but in these days, when a large proportion of all Exhibition work is from hand-camera negatives, there is no reason whatever why hand-camera work should be treated in any other way than according to the merit of the pictures themselves. It would perhaps be reasonable to have a class for subjects which include objects in motion, but at this Exhibition, and in the corresponding classes at other Exhibitions, we almost invariably find that the majority of the negatives might have had quite a prolonged exposure as far as the subjects are concerned.

It is satisfactory to note that the enthusiasm of the members shows no signs of falling off. The entries were over fifty in excess of last year's Exhibition, and the number of exhibitors had increased by eleven. The average size of the pictures was considerably larger. The open classes showed a slightly decreased number of frames. The arrangements of the Exhibition were carried out in the complete way the Hackney Society always carries out its functions. In addition to the usual attractions of an Exhibition concerts were arranged for each evening, and lantern entertainments were given in the small hall.

The Judges were Messrs. A. Horsley Hinton, Harold Baker, and J. B. B. Wellington. We understand the last-named gentleman did not act.

As we have mentioned, the Members' Class for Portraiture, Figure, and Animal Studies showed an improvement, but, at the same time, it was not so strong a class as we think the Hackney Society ought to be represented by, either in quantity or quality. Twenty-seven frames out of the 223 which constitute the members' collective exhibit is certainly an inadequate proportion for all the kinds of subject which are included in the section. Although even the tail end did not descend to the depths which a portrait or figure study is capable of, there was very little evidence of any serious



attempt to treat the subjects in any other than a hap-hazard way. Dr. Roland Smith's *Mother's Firing*, for which he received the silver medal, was quite obviously a boy with a bundle of sticks, standing to be photographed, and the composition was not quite happy. The print was otherwise good, and it struck us that this was the case of a capable photographer undertaking a subject of which he understood neither the possibilities nor the limitations. The portraits, though not showing the quite worst faults of photographic portraits, did not rise above mediocrity. The animal studies, as represented by snap-shots in the Zoo, were quite ordinary, with the exception of W. Selfe's *Lions*, which was admirably treated. A landscape with sheep, by W. L. Barker, was a good attempt; its principal faults were clearly due to under-exposure in the original negative.

The principal exhibitors in the Architectural Class were Dr. Roland Smith and W. Rawlings, nearly one half the pictures in the class being by them, and their collective exhibit would have constituted quite a good class in itself. All the good things, however, must not be attributed to them. G. U. Haslam's work was distinctly creditable, and we can only surmise that W. A. Ellington's exterior of Christ's Hospital was too much unlike the usual thing to please the Judges, for it certainly deserved some recognition, if only for the originality of its treatment.

The Landscape Class was, as usual, by far the largest one, about one half the frames in the members' classes being here shown. There could hardly be any difference of opinion as to the merit of Mr. W. A. I. Hensler's *Stormy Sunset*, which received the silver medal of the class, and the gold medal for the best picture in the members' classes. Mr. Hensler's work has always been good, but he has undoubtedly progressed by leaps and bounds during the past two years. He has attempted more varied subjects, and has greatly increased his knowledge of how to treat them. In losing what had amounted to a maximum, his pictures have naturally become more interesting, especially as he is a very prolific artist. Mr. W. Rawling's work was of its usual refined character, and better, on the whole, than any we have seen previously. Mr. W. Selfe has also made good progress, and his work was an improvement on that of last year, but this we might go on saying until we had almost exhausted the list of the usual exhibitors. Among those to whom this applies are Messrs. F. E. Roofs, W. L. Barker, G. U. Haslam, S. C. Stean, J. J. Westcott, F. W. Gosling, J. Gardner, W. Fenton-Jones, J. O. Grant, and Dr. Roland Smith. Mr. H. W. Lane, whose work we do not remember to have seen before, has had the good fortune to receive the bronze medal in the class.

The Hand-camera Class certainly showed a great improvement on the work usually found in such a class. In many, perhaps most, cases the pictures were enlargements from the original negatives, and, as we have said, quite a large proportion did not suggest any necessity for the use of a shutter for exposure. The bronze medal picture, for instance, was an interior, very nice in its way, but, as it must have had a time exposure, there is no obvious reason why it should be allowed to compete except in its own subject class. Some of the best pictures were contributed by Messrs. F. E. Roofs, W. Rawlings, H. W. Lane, W. Selfe, W. A. I. Hensler, W. Fenton-Jones, G. H. Copper, Dr. Roland Smith, and Mr. W. D. Welford.

The members' lantern slides were more than up to the usual standard. Indeed, we think they were better, on the whole, than those in the open classes.

The General Open Class we thought rather weak, especially in landscape subjects, and this was evidently the opinion of the Judges, for, of four awards (two medals and two certificates), two went to architectural subjects and one to flowers. The Portraiture Class was a better one; still, there was little that was striking. There was an absence of the fine bold work one usually finds here.

The Champion Class contained some fine work, but it maintained the general reputation of champion classes here and elsewhere for containing some of the worst photographs in the Exhibition.

The lantern slides were good on the whole, but the entries were not so numerous as at last year's Exhibition. In the Champion Class, one of the members of the Society, F. E. Roofs, took the bronze medal.

The class for stereoscopic transparencies and prints, though not a large one, contained some very good slides. Both prizes were taken by members of the Society.

Among the principal exhibitors in the Open Classes were J. M. Cooke, H. Quilter, H. C. Lest, J. M. Hoffmeister, H. W. Barnett, H. Lewis, J. Gunston, C. T. Humphrey, W. J. Croall, J. M. Whitehead, F. N. Fielder, J. Auld, S. C. Tyler, Viscount Maitland, R. B. Lodge, W. J. Byrne, C. Speight, C. Sweet, C. M. Wane, J. Leslie Shawcross, W. F. Slater, G. H. Capper, J. T. French, Graystone Bird, Edgar R. Bull, and F. E. Roofs.

There was a loan collection of pictures by J. Page Croft, Wilfrid Groom, J. Carpenter, and Harold Baker; and skiagrams by Dr. C. G. Burton.

The trade exhibitors were Messrs. Watson & Sons, Griffin & Sons, R. & J. Beek, Burroughes & Wellcome, Thorne & Hoddle, and the Tella Camera Company.

The following is the list of awards:—

#### MEMBERS' CLASSES.

Class A (Portraiture, Figures, and Animal Studies).—Silver medal, Dr. Roland Smith; bronze medal, Walter Selfe; certificate, Albert Boes.

Class B (Architecture).—Silver medal, Wm. Rawlings; bronze medal, Dr. Roland Smith; certificate, E. J. Hunt.

Class C (Landscape, Seascape, and Flower Scenery).—Silver medal, W. A. I. Hensler; bronze medal, H. W. Lane; certificates, W. Selfe and S. C. Stean.

Class D (Hand Camera Work).—Silver medal, F. E. Roofs; bronze medal, W. D. Welford; certificates, W. Selfe and W. A. I. Hensler.

Class E (Lantern Slides, set of four).—Silver medal, Dr. Roland Smith; bronze medal, W. Selfe; certificate, W. A. I. Hensler.

(Best Picture in Members' Classes).—Gold medal, W. A. I. Hensler.

#### OPEN CLASSES.

Class F (General).—Silver medal, C. H. Oakden; bronze medal, J. M. Whitehead; certificates, H. W. Bennett and Hugh Lewis.

Class G (Portraiture and Genre).—Gold medal, F. N. Fielder; silver medal, C. Sweet.

Class H (Champion).—Gold medal, J. Leslie Shawcross; silver medal, J. M. Whitehead.

Class I (Lantern Slides, sets of four).—Silver medal, R. B. Lodge; bronze medal, J. Gunston; certificate, Graystone Bird.

Class J (Lantern Slides, Champion sets of four).—Silver medal, E. R. Bull; bronze medal, F. E. Roofs.

Class K (Stereoscopic Prints and Transparencies, sets of four).—Silver medal, L. S. Wilks; bronze medal, A. D. Fort.

Silver medal for best trade exhibit.—W. Watson & Sons.

#### ENLARGING SIMPLIFIED.

In the course of a practical chat on "Enlarging," before the Members of the Borough Polytechnic Photographic Society, Mr. R. R. Rawkins described what he considered to be an ideal enlarging camera, and one which he had in use for a considerable time with highly satisfactory results. Its construction was extremely simple, and, although artificial light formed the illuminant, yet his method of working quite obviated the use of a condenser. The objective consisted of an ordinary bellows camera and lens, and the one by which the negative was produced answered all purposes. This was affixed before a suitable opening in a box containing the source of illumination. Personally, he used two incandescent burners, placed on either side of the opening, each having a semicircular reflector in order to prevent any direct rays from reaching the negative. The whole of the inside of the box was painted or papered white, and by this means the light was reflected back, and evenly distributed throughout the plate. Oil lamps could be used in a similar manner, and those with circular wicks were perhaps the most suitable. Whilst the simplicity and cheapness of this arrangement was obviously apparent, he claimed that it was the only reliable method by which enlargements could be made from negatives that had been "doctored" to any extent. This was impossible when using a condenser, as such "faking" would be amplified in the resulting enlargement. Again, it was superior to daylight, inasmuch as the light was always constant and under perfect control. He thought there was a good opening for some enterprising manufacturer to put on the market such an apparatus as he had described.

#### A NEW METHOD OF ARTIFICIAL LIGHTING FOR PORTRAITURE.

At the last meeting of the Croydon Camera Club, Mr. W. H. Smith gave a demonstration of "A New Method of Artificial Lighting for Portraiture."

Mr. Smith, at the outset of his remarks, alluded to a few of the methods of artificial lighting in use for photographic work. There were great disadvantages in the systems already adopted. The arc lamp had its drawbacks in its expense of current and skilled labour required to use it and also in its varying candle power. A certain system of incandescent lights seemed to have an insufficient reflecting surface, and was deficient in actinic rays. Incandescent gas was probably the worst of the lot, as it was found not very durable, the heat was unbearable, and the light far from satisfactory. Flash lamps were rather dangerous, and a nuisance also arose from the fumes and products of combustion. One of the great difficulties experienced with artificial light was the want of diffusion, and he had come to the conclusion that they might obtain what they wanted, viz., a pure reflected light, with magnesium burned in oxygen. With this end in view, he had fitted up a room lined with white paper to diffuse the light satisfactorily and evenly. Mr. Smith then proceeded to explain in detail the various experiments which had led to the present invention. This was a piece of magnesium ribbon, fired by a current of electricity in a glass combustion vessel containing oxygen, with the help of mechanism specially contrived for the purpose. The cost of this system of lighting was very small, the total outlay being about one farthing per exposure. He had arranged his apparatus so that just as much oxygen would be taken up as was needed for the exposure. About five inches of magnesium wire was used at one time, and the combustion vessel contained a little water to keep it clean.

With the assistance of Mr. A. Beales at the camera a number of negatives were taken by the new light of those present, and these, on being developed, showed most clearly the success and importance of the apparatus invented by Mr. Smith.



The President, in subsequently inviting questions and criticism, said he was sure all would join with him in expressing their pride and admiration of the demonstration which had been shown them that evening by their fellow member, Mr. W. H. Smith. It was undoubtedly a great step forward in artificial lighting, and they could congratulate themselves on the fact that this had been first displayed to that Club.

Mr. Maclean handed round a print from a negative he had taken with the lamp, which was much admired.

Mr. Packham said, in his view, it was the acme of perfection for both professional and amateur, and it would not be surprising if it were more favoured than even daylight illumination, for by this apparatus they could always get the same amount of actinic power.

Mr. Beales also gave it as his opinion that this was a step in advance of even daylight, and he regarded it as a very smart invention indeed. He had ordered three of the appliances, and should start using them, as he regarded this as the future light.

Very enthusiastic votes of thanks were then passed to Mr. Smith for his lecture, and to Mr. Beales for his help in putting the light to a practical test before the audience.

#### THE BRITANNIA WORKS COMPANY.

The following is an extract from the Directors' report for the year ended October 31, 1899, to be presented at the Third Ordinary General Meeting, to be held at Winchester House, Old Broad-street, E.C., on Wednesday, November 29, 1899:—

The Directors have the pleasure to report that after payment of working expenses, Directors' fees, income-tax, &c., and making provision for doubtful debts, the net profit for the year's trading is 51,928l. 12s. 2d.

† This amount, with 5637l. 3s. 1d., brought forward from last year, gives 57,565l. 15s. 3d. for appropriation.

† The Directors have paid an interim dividend on the ordinary share capital, for the half-year ended April 30, 1899, at the rate of 8 per cent. per annum, free of income-tax, absorbing 7600l.; and for the same period they have paid the dividend on the 6 per cent. preference shares, amounting to 5700l. Since then the second dividend on the 6 per cent. preference shares has been paid. From the balance the Directors recommend that a dividend be paid on the ordinary share capital for the half-year ended October 31, 1899, at the rate of 12 per cent. per annum, free of income-tax, making with the above interim dividend 10 per cent. for the year; this will absorb 11,400l. On this dividend, by the terms of the profit-sharing scheme submitted at the last meeting, 718l. 15s. 10d. will be paid as bonus to the *employés*. Of the balance, 26,451l. 19s. 5d., the Directors recommend that 14,899l. be written off goodwill, processes, &c., that 8000l. be placed to reserve, and the balance, 3552l. 19s. 5d., carried forward.

The business continues to show satisfactory progress, the sales having been considerably larger than last year.

#### RESULTS OF THE "MAWSON" PRIZE COMPETITIONS.

The following are the results of Messrs. Mawson & Swan's Prize Competition, 1899:—

Class I.—The Best Snap-shot Photograph on Films only (5×4 and under), 5l., 4l., 3l., 2l., and 10 of 1l. each.—E. D. Girdlestone, A. Thomson, W. B. Green, W. H. Barraclough, J. W. Ellis, H. Phillips, W. G. Elcombe, J. L. Griffiths, E. G. Boon, Mabel Metcalfe, C. F. Inston.

Class II.—The Best Snap-shot Photograph on Plates or Films (5×4 and under), 5l., 4l., 3l., 2l., and 10 of 1l. each.—T. Hartley, W. Kilbey, C. F. Inston, H. Holt, H. C. Leat, A. P. Russell, G. Edwards, T. J. Crofts, W. B. Green, E. W. Philpott, C. Church, W. Mitchell, W. H. Barraclough, E. A. Boon, W. H. Pallister, J. T. Rodgers.

Class III.—The Best Landscape or Seascape Photograph on Plates or Films (8½×6½ and under), 7l., 6l., 5l., 4l., 3l., 2l., and 10 of 1l. each.—T. Hartley, W. Norris, J. Patrick, V. C. Baird, W. M. Dodson, J. K. Ayling, J. W. Ellis, W. H. Berkeley, A. J. Squires, E. W. Philpott, W. Atkinson, T. Stratton, A. W. Cooper, R. H. Beavan, C. F. Inston, W. Haslett, W. Kilbey.

Class IV.—The Best Portrait (Groups included), Photograph on Plates or Films (8½×6½ and under), 7l., 6l., 5l., 4l., 3l., 2l., and 10 of 1l. each.—Graystone Bird, F. W. Fielder, C. P. Cassine, F. Coop, N. Elliott, F. M. Sutcliffe, W. G. Clark, A. Dwin, S. H. Wrighton, W. McLean, W. Lindhe, F. W. Beilby, W. Mitchell, J. Walker, G. Edwards, W. Atkinson.

#### AT THE CAMERA CLUB.

The Camera Club lectures have not, during the past week or so, partaken of that photographic character which one is led to associate with that comfortable home of things photographic. Still, it is difficult in these days to take up any subject which does not in some way employ the camera, so that, either directly or indirectly, the Club members get their appetites whetted by the varied bill of fare prepared for them by the energetic Hon. Secretary, Mr. Godfrey.

On Thursday, the 9th inst., Dr. Hampson gave a lecture on "Liquid Air," which aroused the very greatest interest, and his discourse was not only abundantly illustrated by unique experiments, but the members were enabled to see the air in process of liquefaction. So far as we can remember, this interesting process has never been made manifest to an audience before. The apparatus used is of Dr. Hampson's invention, and consists of a small cylinder, the interior of which is crowded with the convolutions of a narrow-gauge copper tube, the whole arrangement being jacketed in a heat-excluding cover. First the copper tubing was cooled by the expansion of air and carbon dioxide, and shortly afterwards air alone was admitted. In a short time it was visible in a liquid state running from the apparatus. Dr. Hampson gave a capital lecture, and made a difficult subject easily understood. A short discussion followed the lecture, the remarks of the speakers very naturally trending towards the behaviour of photographic sensitive surfaces under the action of such intense cold as was represented by liquid air.

On the following Monday Mr. Spiers gave an admirable account of photographic work at high altitudes, illustrating his paper with some truly magnificent pictures taken in the Matterhorn district.

Mr. H. W. Chubb gave, on Thursday, 16th, a most interesting lecture on mediæval and other locks, and it was most thoroughly illustrated in a somewhat novel manner. First, the walls of the Club-room were covered with large and elaborate drawings of locks and keys of nearly every conceivable pattern. These served to illustrate the first portion of the lecture. Next came a lantern section, which included a number of most cleverly contrived mechanical slides, by which the movement of different forms of locks was beautifully shown. Lastly, the lecturer used an aphengescope, or reflecting lantern, for showing parts of locks and keys in a manner which would have been impossible by any other means, so that in this case the Camera Club enjoyed a well-delivered lecture on a non-photographic subject, which was illustrated by means which were of peculiar interest to them.

But, without any such elaborate setting, Mr. Chubb made the subject, of which he is a master, most interesting and entertaining. There is nothing *per se* in a modern lock which would tempt any man to express deep interest or keen delight; but, when the evolution of the lock and key is followed up from the simple bar running into fixed staples, it must be conceded that it is a very fascinating subject. Mr. Chubb dealt with it under two aspects, artistic and mechanical. The first key was shaped like a hook or scythe, the point of the instrument being used to raise a pin, which dropped into a sliding bar. Such a lock was used in the time of Pharaoh, 4000 years ago. Much the same arrangement was shown in the lock which the lecturer had brought from a barn door in Switzerland. Next were shown specimens of Roman locks, chiefly from Pompeii, and these, strangely enough, were comparable with present-day locks made in China and Japan.

One curious key, of Roman origin, formed part of a finger ring. This probably was the key of a wine cellar, for, when a wealthy Roman took to himself a bride, she was presented with all the keys of the house save one, and that was the key of the cellar. A curious feature of this particular key was, that the barrel was pierced right through, so that no fluff could lodge in it, as it so often does in a modern key. Mr. Chubb said that this old Roman notion was patented about twice every year in our own model Patent Office, which will calmly allow aspiring inventors to indulge in such vagaries so long as they pay the necessary fees. He also showed a key ring which he wore on his own finger, remarking that the New York customs officers were so interested in the curiosity that they chalked his luggage without examining it.

Keys of the early Renaissance and the Renaissance proper were also shown, together with many old curious locks. Some of these were of the most elaborate decoration, and it was not difficult to believe the statements of an old French locksmith, who states, in a book upon the subject of his craft, that some keys took a man twelve months of steady work to make. The trade guilds at that time were far more onerous in their conditions than are the trades unions now, but their efforts did not tend to make a man scamp his work, but to improve it, no man being allowed to become a member before he had sent in a masterpiece showing what his hands could do.

The lecturer concluded with an interesting account of the manner in which modern locks and safes were made, especial attention being given to the wonderful time and combination locks which are attached to strong-rooms at banks, &c. Pictures were also shown of collections of burglars' tools made for the purpose of breaking into these strong-rooms, and defying bolts and bars. Keyholes are now unsafe, for they afford lodgment for small charges of dynamite the explosion of which would wreck an ordinary lock. In a modern safe, therefore, the keyhole is absent. The chronometer lock inside is set to a certain hour, say nine a.m., and, when nine o'clock strikes, the mechanism acts automatically and the bolts are withdrawn.

#### Our Editorial Table.

THEORIE UND GESCHICHTE DES PHOTOGRAPHISCHEN OBJECTIVS.

By DR. MORITZ VON ROHS. Berlin: Julius Springer.

SINCE the publication of Dr. Josef Maria Eder's volume of the *Handbuch*, dealing with photographic lenses, this is unquestionably the most im-



portant work which has been published on photographic optics. The author, as one of the members of the scientific staff of the Carl Zeiss Optical Works, at Jena, has not only had special opportunities to investigate various branches of the subject, but has been able to avail himself of the services of trained calculators in giving a graphic representation of the possibilities of most of the photographic lenses which have been constructed during the last sixty years. As might be expected, the result is a masterly and comprehensive treatise that will rank as a standard book of reference on photographic optics.

The first part of the work, covering some ninety pages, deals with the theory of photographic lenses and their defects. The exposition is lucid, and the author has made it his aim to bring this portion of the work within the grasp of the general reader.

The second part of the work, comprising about 300 pages, is an historical account of the development of photographic lenses from the single landscape lens of Charles Chevalier to the astigmatically corrected combinations of recent years. With pardonable pride we read Dr. von Rohr's acknowledgment of the valuable assistance he has received from the volumes of *THE BRITISH JOURNAL OF PHOTOGRAPHY*, and the Royal Photographic Society may also be congratulated upon the great service afforded by its library. The history of photographic optics is divided by the author into various periods, or schools, viz., the optics of the camera obscura at the time of the discovery of photography; the Franco-Italian opticians; the English-American opticians; and the Germano-Austrian opticians. The exposition enables the reader to trace very clearly the development of the various single lenses, the doublets and the triplets, and their variety will perhaps be a surprise to many photographers. In this brief account of Dr. von Rohr's work it would be an over-accentuation of the work of English opticians to quote his appreciation of their services. Goddard, Thomas Grubb, Andrew and Thomas Ross, and J. H. Dallmeyer, as leading figures of the old school, meet with due recognition, but whilst the author is not prepared to admit great powers of originality on the part of the last-named optician, the fact remains that his work was highly popular with photographers both here and abroad. As might be expected, the influence of the late Traill Taylor receives its acknowledgment. Dr. von Rohr justly points out that the patents secured by Continental opticians have limited the efforts of recent English opticians, but he also recognises that, whilst the doublet has been practically forbidden ground, notable lenses have been made of the triplet type, which may be regarded as a characteristically English combination. It is also deserving of note that the firm of Ross & Co., through Dr. Hugo Schroeder, was the first to take advantage of the new glass for photographic purposes, as the conentric lens due back to 1887, although it was not placed upon the market until 1892.

Turning to the Germano-Austrian school, it will at once be recognised that it comprises the men who have contributed the most important work to the optics of photography. J. Petzval, Adolph Steinheil, Professor Abbe, and Dr. Rudolph stand head and shoulders above other contemporary opticians. The detailed account which Dr. von Rohr has given of the work done by Dr. Adolph Steinheil and Dr. Rudolph constitutes a valuable addition to the literature of photographic optics. Nor should we omit to mention the great services of Dr. von Hoegh, as testified by the objectives he has calculated for C. P. Goerz. Drs. Kaempfer and Miethe, as representing the firm of Voigtlander & Sohn, have also indelibly impressed their names upon the roll of opticians.

The work concludes with a series of diagrams representing the residuum of spherical aberration and astigmatism in a large number of lenses referred to in the text. This is, doubtless, a very valuable index to the performances of the various lenses, but it must be examined with due regard to the conditions laid down by the author. The curves have been calculated, doubtless, with the utmost care and with a sincere desire to represent the lenses accurately, but the data are taken from specifications which do not necessarily correspond with the lenses actually upon the market. A patent specification serves to secure the right of the inventor to the essentials of the particular construction, but the lens may differ in its details. Thus we find Dr. Steinheil's orthostigmat, Type II., represented by curves calculated from the patent specification with aperture  $f/6$ , whereas the lens is manufactured with the smaller aperture,  $f/6.8$ . Comparisons must therefore be made by the reader with due regard to the data given.

We have only been able to give a brief sketch of Dr. von Rohr's book, but we trust we have made it clear that it is of great merit and worthy of serious study.

#### NATURE MOUNTS.

Messrs. PERCY LUND, HUMPHRIES, & Co., of Bradford, send us a packet of their Nature mounts. This is a new style of mount, made of stout, rough paper, adapted for postal cards and for every occasion where thick cardboard would be objectionable. The mounts are suitable for platinum, carbon, bromide, or gum-bichromate prints, but their employment for ordinary glazed sensitised papers is not advised. They are made in four special tints—grosvener green, playfield cream, duffel grey, and grey bark, selected to harmonise with the principal shades of carbon, gum, and platinum. Those who adopt these mounts are advised to use paste sparingly, roll the print well down with a squeegee, and place under a weight for a time to ensure flatness. They are supplied in

assorted packets, or packets containing one tint only. A white tint is the latest introduction to the series, which should be in great demand for a more tasteful mounting of prints than is required in the production of the "usual thing."

We have received from Messrs. Osman & Co., of 182 and 184, Commercial-street, London, their forty-page illustrated price-list of horticultural sundries, fancy goods, and imperishable palms. The latter might be found of service by our professional readers in the adornment or decoration of the studio.

Messrs. DAWBARN & WARD, of 6, Farringdon-avenue, E.C., have commenced the publication of a series of books on the useful arts and handicrafts under the general editorship of Mr. H. Snowden Ward. The first of the series, entitled *Designing and Drawing for Beginners*, by Mr. C. G. Leland, M.A., has just been issued, price 6d. The series is intended to be large and comprehensive, and it should be found of great use to practical students of the minor arts and crafts.

Messrs. HEPWORTH & Co., cinematographers, of Hurst Grove, Walton-on-Thames, send us some excellent examples of their cinematograph film work, accompanying which are a full synopsis of two entertainments with the optical lantern and cinematograph, given by Mr. Hepworth; a list for the trade only, and a detailed list of Hepworth film subjects for the cinematograph manufactured solely by Messrs. Hepworth.

#### SCOLI GLUE.

COLLOID, LIMITED, of 121, West George-street, Glasgow, write us: "With reference to the discussion that is going on in your *JOURNAL* re mounting, I am to-day forwarding you a sample tin of our scoli glue. This has been on the market now for over three years. It does not cockle the mount if only a thin layer is put on, and it is warranted to contain no acid or other material that would injure the photo."

\* \* Owing to great pressure on our space this week we have been obliged, at the last moment, to hold over several notices and reviews.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening November 29, 1899, at eight o'clock. "How I Photograph Domestic and Wild Animals," by Mr. Thomas Fall, F.R.P.S.

THE Hon. Secretary of the Hove Camera Club writes: "Will you kindly note in your next issue that the entries to our Exhibition close on Saturday next, November 25." *W. E. W.*

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting. Tuesday, November 28, at 66, Russell-square, at eight p.m. "Practical Three-colour Lantern-slide Making," by Mr. E. Sanger Shepherd.

THE AUSTIN-EDWARDS MONTHLY FILM NEGATIVE COMPETITION.—The prize-camera for the current month has been awarded to Mr. E. Thompson, 53, Croxteth-road, Liverpool, for his negative, *Black Kittens at Play*.

Messrs. ADAMS & Co., of 31, London-street, Greenwich, S.E., in sending us their price-list, observe that the Photographic Printing Department is under the control and supervision of Mr. A. Stephens, and is in addition to the already existing business of Mr. E. P. Adams (Adams & Co.). Albumen printing will receive special attention, the paper being sensitised daily.

CRYSTALS ETCHED ON GLASS.—Mr. C. E. Benham, of Colchester, has, it is said, produced some interesting effects by crystallising various salts in a thin layer on glass, and then exposing the glass to the vapour of fluoric acid. The crystals act as a "resist," and their microscopic forms are beautifully reproduced etched into the glass. The exposure to the vapour varies from three to five minutes, the glass being first well warmed to prevent the crystals from dissolving.

A THOROUGHLY practical lecture was that delivered by Mr. H. W. Bennett, F.R.P.S., before the Borough Polytechnic Photographic Society on the 15th inst., on "Architectural Photography," when, by the aid of a piece of chalk, blackboard, and duster, the lecturer succeeded in emphasising his points with considerable clearness. Sketches were made of several of the last Pall Mall exhibits in order to illustrate various defects and irregularities in the general composition and arrangement of architectural subjects.

Re HENRY R. TREVETHICK, photographer, 1, Orchard-street, Sheffield.—This debtor appeared for public examination at the Sheffield Bankruptcy Court on Nov. 16 last before Mr. Registrar Binney. The summary of accounts filed by the debtor disclosed liabilities amounting to 385*l.* 13*s.* 6*d.*, and assets estimated to produce 69*l.* 17*s.* 7*d.* The Official Receiver stated that the examination had been adjourned from the previous sitting of the Court in order that the debtor might be enabled to file a cash account. The account had since been filed, and, as it was satisfactory, he had no objection to the examination now being closed. The Registrar accordingly allowed the debtor to pass his examination.

THE Duke of Newcastle personally inspected the installation of Röntgen apparatus, on November 21, on board the *Princess of Wales*. In addition to the electrical necessities his Grace has provided all the materials likely to be of use in the photographic department. His Grace being an amateur photographer, no detail has been missed. Mrs. Blewitt (wife of General Blewitt) and friends are donors of the outfit for ss. *Spartan*, and, as Sir Peter and Lady Walker have provided the apparatus needed, all three ships will be now thoroughly equipped. The Duke of Newcastle has also provided a number of Dr. Walsh's books on the use of Röntgen rays, together with charts for reference, which are to be distributed to the surgeons on the hospital ships.



THE following are some recent additions to Messrs. Fuerst Brothers' list of cinematograph films: 9101, Coldstream Guards embarking on troopship *Gascon* (close view); 9102, Coldstream Guards embarking on troopship *Gascon* (showing the Royal Engineers in the foreground); 9103, Departure of troopship No. 4 (*Nubia*), with Scots Guards aboard, Southampton, October 28, 1899; 9104, 1st Battalion Rifle Brigade embarking on s.s. *Gascon*; 9105, H.R.H. the Duke of Connaught and party coming aboard to bid farewell; 9106, Soldiers waving "Good-bye" as ship leaves; 9107, Union liner, *German*, departing (close view, showing soldiers); 9108, Wiltshire regiment, church parade, the Sunday before leaving for the Transvaal; 9109, A Basuto "indaba" (animated war council); 9110, Royal Horse Artillery firing guns (good smoke effect); 9111, Brick battery in action (good smoke effect); 9112, Disappearing guns at Shoeburyness (good smoke effect).

ROYAL PHOTOGRAPHIC SOCIETY.—*Fellows Admission Committee*.—The next meeting of this Committee will take place on Tuesday, December 5, for the examination of the qualifications of applicants, who are referred to the following bases of qualification: Applicants must be members of the Society. They should furnish the names of one or more members of the Society to whom they are personally known. The receipt of the medal of the Society is in itself sufficient upon which to base an application for Fellowship. The candidate is expected to make a written statement of his qualifications in relation to one or more of the following heads: Important contributions to photographic knowledge, either in theory, practice, or invention; the production of notable work, either in pure photography or in the arts and sciences kindred thereto; work done in disseminating photographic knowledge, or any public service tending to the advancement of photography. Further particulars, forms, &c., may be obtained on application to the Assistant-Secretary, at 66, Russell-square, W.C.

Re L. J. JESSOP, photo-engraver, 25, Farringdon-avenue, London, E.C.—The first meeting of the creditors interested under this failure was held at the London Bankruptcy Court, under the presidency of Mr. Howell, Assistant Receiver. No statement of affairs was filed, but the liabilities were estimated at 1200*l.*, with assets consisting of shares valued at *nil*. The debtor stated that he began business in September 1897, in partnership as a photo-engraver, in the Strand. In the following February the partnership was dissolved, the debtor taking over the business, which was subsequently removed to 25, Farringdon-avenue, E.C. In the autumn of 1898 he sold the business to the Holborn Press, Limited, who agreed to pay him 2000*l.* in cash, and 2000*l.* in fully paid 1*l.* shares. The company carried on business for about six months, and then went into liquidation. The debtor stated that he had been without occupation since the failure of the company. He made no proposal to the creditors, and the case went into bankruptcy, with the Official Receiver as trustee. The debtor attributed his insolvency solely to the failure of the company. The public examination is fixed for December 14.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
27.....	Bradford Photo. Society .....	Egypt. W. Claridge, M.A.
27.....	Camera Club .....	Lantern-slide Trial Evening.
27.....	Oxford Camera Club .....	Prize Slides.
28.....	Birmingham Photo. Society ..	Developers and Development. Prof. C. H. Bothamley, F.I.C., F.C.S., F.R.P.S.
28.....	Hackney .....	Technical Control for Pictorial Results. W. Thomas.
28.....	Leeds Photo. Society .....	In Search of the Picturesque. J. W. Wade.
28.....	Royal Photographic Society ..	Practical Three-colour Lantern-slide Making. E. Sanger Shepherd.
29.....	Borough Polytechnic .....	Gravura Paper. A. O. Baldwin.
29.....	Oroydon Camera Club .....	Conversational Meeting.
29.....	Photographic Club .....	How I Photograph Domestic and Wild Animals. Thomas Hall, F.R.P.S.
29.....	Southsea .....	Demonstration: <i>Velox</i> Papers and the New Developer Kachin. Donald A. Nightingale.
29.....	West Surrey .....	Outing Competition.
30.....	Camera Club .....	Travel in Persia. Basil Williams, M.R.A.S.
30.....	Leigh .....	Film Photography (Wellington & Ward's New Film). H. Wade.
30.....	Liverpool Amateur .....	Belgium. Dr. J. W. Ellis.
30.....	London and Provincial .....	Open Night.
30.....	Oldham .....	The Practical Treatment of Lantern Slides. J. Hall.
December.		
1.....	Ashton-under-Lyne .....	Elementary Photography Class.
1.....	Borough Polytechnic .....	Practical Evening: Lantern Slides.

### ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 21,—Mr. H. Snowden Ward in the chair.

#### ARCHITECTURAL PHOTOGRAPHY.

Mr. HENRY W. BENNETT, F.R.P.S., read a paper on "Architectural Photography," in which he dealt mainly with that class of work which had for its object the pictorial representation of some fine or characteristic piece of architecture rather than the accurate reproduction, which aimed at fulfilling the functions of working or detail drawings, and it was written specially in connexion with the architectural photographs in the Society's recent Exhibition. Referring first to the question of selection, the author said that no effort should be spared, and no time considered too great, for selecting a subject and studying the conditions requisite for expressing it in the most characteristic manner. Whatever the subject, it should possess some characteristic architectural feature in addition to its photographic quality, and also a due proportion of foreground and extreme distance, an entire absence of any suggestion that

it is incomplete or imperfect; the perspective should not appear strained or unnatural, the composition should be good, and the disposition of light and shade should be harmonious and satisfactory. One very weak point in many architectural photographs was the want of sufficient foreground, the sense of the space between the observer and the nearest vertical object being lost if the floor was cut off too closely. Distance was quite as important as in landscape work; there should always be something, or the suggestion of something, beyond the principal object of interest. Nothing was worse than to see the whole of a subject in one plane, as was frequently the case when doorways were photographed, in which case the mere opening of the door would give the suggestion of distance and save the picture. In this connexion the author emphasised the importance of selecting a standpoint yielding an angular rather than a square view, as the placing of the camera directly in front gave a result too geometrical to be pleasing, and destroying the sense of relief. The Exhibition contained many examples, some of them by leading workers, of the disregard of the quality of completeness, an arch or column being broken off just incomplete, and this was a fault which could not be too strongly condemned. A considerable part of the paper was devoted to the discussion of questions of exposure, development, and printing. For interior work, Mr. Bennett was of opinion that the most suitable weather was when there were plenty of light clouds, the light being then so diffused that the dark corners were well illuminated and the lighting of the whole building was soft and harmonious. With regard to the camera, rigidity rather than lightness should be studied, the focussing should be from the front, and the extension should range from two-thirds to at least twice the length of the plate. The front should be capable of rising to the extent of one-third the length of the plate, and the bellows should be attached to the rising portion of the front, to prevent the cutting off of any portion of the picture. The use of a tripod stay, consisting of three slotted bars connected by screws and attached to the legs of the tripod, was strongly recommended for the prevention of slipping, an additional safeguard being obtained by inserting the points of the legs in corks or indiarubber tubing. The lens should cover an angle of 100°, to allow of perfect definition to the margins of the plate when the lens was raised much above the centre. The necessity for good perspective rendering applied with great force to architectural subjects, and so much depended on the relation between the focus of the lens and the size of the plate, that this question of perspective should receive particular attention. Mr. Bennett thought that the most satisfactory length of focus ranged from rather less than the length of the plate to about 1½ times, or for a 12×10 plate from 10 or 11 inches to 16 or 18 inches. An 11-inch lens on a 12×10 plate, if judiciously used, would not produce the exaggerated perspective that disfigured photographs taken by very wide-angle lenses, and would include sufficient of the subject to produce a pleasing composition under all ordinary circumstances. The camera should be placed at about the normal height of vision. Working from a height had nothing to recommend it, and was condemned by the results obtained by that method. Plates of moderate rapidity were to be preferred. With regard to exposure, actinometers were of no practical value for interior work, the only reliable method being to estimate the exposure from the appearance of the image on the ground glass. The lecturer preferred to develop for density first and for detail afterwards, commencing the development of all negatives with a standard developer containing in each ounce 1½ grains pyro, 1½ minims ammonia, and ¾ grain ammonium bromide. He aimed at securing a negative with a rather longer range of gradation than the printing process would render, and then, by covering the glass slide with tracing paper, and cutting away or adding to the paper as required, he produced a more harmonious and satisfactory rendering than would be possible by developing a thinner type of negative.

Mr. Bennett's paper was illustrated by sketches of architectural pictures exhibited at the recent Pall Mall Exhibition, and by slides from his own negatives.

Mr. SEBASTIAN DAVIS raised the question as to the relative advantages of tilting the camera and using the swing back, as against the use of a considerable rise of front. He preferred the latter method.

Mr. BENNETT said his invariable practice was to level the camera, with the front and back vertical and parallel, and not to move it; it was for that reason he emphasised the necessity of using a wide-angle lens, so that the lens might be raised without cutting off the corners of the picture. Many interior subjects required a prolonged exposure with *f*/32; if the front and back of the camera were not parallel, it would be necessary to use an exceedingly small aperture to get good definition, and the exposure would consequently be so prolonged as to render many subjects impossible.

The Rev. F. C. LAMBERT referred to the difficulty of securing detail in dark roofs, and remarked that such subjects could be more conveniently undertaken when there was freshly fallen snow outside, a great deal of additional light being then reflected into the darker portions of the structure. He asked what plan Mr. Bennett adopted for focussing in dark interiors, &c.; whether he recommended artificial illumination by means of magnesium wire or otherwise.

Mr. BENNETT thought that dark roofs should be shown dark in the photograph. For focussing in dark places, when the authorities would not permit the use of lights, he generally put a sheet of white paper at such an angle that it would reflect what little light there was on to the object to be focussed, and by the aid of a powerful magnifier he managed to get the image fairly sharp. He did not advocate the use of magnesium wire, which gave a patchy and unnatural result.

Mr. E. MARRIAGE showed some slides illustrating the results obtained with lenses of different focal lengths, and said he preferred a lens of longer focus than Mr. Bennett had suggested, although the question largely depended upon the taste of the worker.

Mr. J. C. S. MUMFERY thought the question of long or short focus was much influenced by the character of the building. A Norman doorway often looked extremely well in a front view because it was geometrical in design, and the solid geometry of the structure was thus emphasised. A dark roof was sometimes a great advantage from a pictorial point of view, the gloom imparting majesty and beauty to the whole, and it was frequently intentional in the building.



Some further remarks were made by Messrs. BOLAS, BECKETT, and others to which Mr. BENNETT replied, and the CHAIRMAN expressed the indebtedness of the Society to the lecturer for giving a paper so full of valuable hints and thoughtful suggestions.

#### COMING EVENTS.

November 28, "Practical Three-colour Lantern-slide Making," by Mr. E. Sanger Shepherd. December 5 (Lantern Evening), "Lincoln Cathedral," by Mr. Frederick H. Evans.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 16.—Mr. H. C. Rapson in the chair.

Mr. S. H. FAY showed a speaking example of what may happen to a photograph by its being printed on two different makes of paper, or on pieces of the same paper cut from the sheet in different directions. The same negative was used in printing the two portraits, but it was found on measuring the same that one was two millimetres longer in the head than the other. The shorter of the two was right for length, but added somewhat to the true width of the face. The longer one, on the other hand, was fairly right for the width, but falsely represented the length of the head. The difference was everything between a face tending to fulness and one having the contrary characteristics.

Mr. WALTER D. WELFORD brought forward a new flashlight powder which he had received from Messrs. Fuert Brothers. For it was claimed an absence of all smoke, residue, and explosive properties, while, on the other hand, it was not based upon chlorate of potash or picric acid. It gave an exceedingly brilliant flash. Two quantities were fired, and, although smoke cannot be said to have been absent, yet so little was there that it readily dispersed and was lost. In making flash exposures of a group there is often a desire on the photographer's part to be in the group. For this purpose a length of touch paper, which is also supplied, will be found useful.

#### STRIPPING NEGATIVE FILMS FROM GLASS.

Mr. FRANK KELLOW described an easy method for removing and transferring gelatine films from glass. Many people, he observed, saw in such operations as those he was about to demonstrate great difficulty and risk of damage, but this was mostly due to fancy. He had saved by its means many negatives which had been accidentally cracked, and, as this might occur with anybody, he proposed to show the *modus operandi*. A formula was published some time back composed of carbonate of soda and formalin, followed by hydrochloric acid. With this, however, he found the gelatine rather apt to blister. For the carbonate of soda he therefore substituted caustic potash. The following solutions are made up:—

A.	
Ten per cent. solution of caustic potash .....	$\frac{1}{2}$ ounce.
Commercial formalin .....	$\frac{1}{2}$ "
Water .....	5 ounces.
B.	
Hydrochloric acid .....	1 part.
Water .....	60 parts.

The negative is put for five minutes in Solution A, followed by a similar period in Solution B. If the negative be cracked, a little preparation is required, or the sharp edges of the glass will cut through the gelatine. The method he adopted was to take a clean piece of glass upon which the glass side of the negative was affixed with Canada balsam, thinned down with benzole, previously heating the glass plate. It was then set aside to harden for some twenty-four hours, when it could be treated as described. This applies only to negatives of which the glass is cracked but the film not broken. With negatives of this latter category a further difficulty is encountered. Means must be taken to fit the severed piece exactly to its counterpart in the way described for the cracked glass. A solution of pure gelatine is then prepared and poured hot over the whole of the film, allowed to set and dry, afterwards being soaked in formalin solution.

In reply to an observation, he agreed that cobbler's wax or marine glue would serve instead of the Canada balsam, but he had not used other than the last-named. The hot gelatine solution had not, in his hands, melted the gelatine film or spoiled the image. Probably, as Mr. Haddon suggested, the developed film was sufficiently tanned to withstand the solvent action of the hot solution. After the immersion in the acid bath, B, the film readily came away, and could be transferred to a new glass, or reversed, as desired. It may then be dried, washing afterwards to get rid of the acid. It was curious to note that this method did not act with other than developed and fixed plates. He objected to the carbonate of soda on account of its tendency to unevenly stretch the film.

Mr. P. EVERITT thought that its power of stripping a developed and fixed film, while refusing to bring away that of an unexposed or undeveloped plate, would be explained by his idea of the action that went on. The fixed film he likened unto a sponge. The particles of silver unexposed would lie near to the back of the plate, and these fixed out would leave the film full of minute interstices. The formalin hardened the surface, and the acid worked through underneath, and the sponge formation facilitated the removal of the film.

Mr. A. HADDON thought that he would prefer the use of hydrofluoric acid to dabbling with caustic potash. Unless the former were very strong, it would not be so harmful. He thought, too, that the acid from Solution B might be removed at once by immersion in a judicious blend of alcohol and water.

Mr. S. H. FAY preferred the preparation made by Avery for stripping purposes. It was a very expeditious operation. He usually cut the negative film through with a knife, about one-eighth of an inch from the edge all round. This gave a new and clean edge to the film. He then flowed over the plate a small quantity of the formalin and spirit solution, with a few drops of fluoric acid. A piece of paper served to guide the stuff over, and the fingers need not come into contact at all with the mixture. After fifteen or thirty seconds, the film would probably lift up; if not, another application would ensure its removal. A good way to remove the film, when treated, was to rub down upon it a sheet of good surfaced paper—not a bibulous sample; lifting a

corner, and with it the film, one could strip the two together without fear of damage to the gelatine. The hydrofluoric acid was in such small proportion that little harm could result from it, but the application of several more doses of the formalin and spirit would practically remove it. For celluloid films some other treatment was required. He coated the gelatine film with gelatine solution, and, after drying same, put the whole into a solvent of celluloid. The supplementary coating of gelatine gave the negative film sufficient body to stand handling.

**North Middlesex Photographic Society.**—November 13, Mr. J. MacIntosh in the chair.—Mr. E. J. WALL gave an interesting lecture on

#### THREE-COLOUR WORK.

He explained the difference between colour photography by means of pigments and by the transparency method, and the reason why different colours had to be used for each method. He described the method of preparing suitable screens of red, blue-violet, and green, as in the Ives process of colour projection, and also the way in which prints in pigments were produced. Slides by Ives's process and that of Joly were projected on the screen. In the former, the three separate coloured images were shown and then combined, and, in the latter, the slide was shown without the special screen of ruled coloured lines, and afterwards with it the lines in the slide cutting out those in the screen where they were not wanted, so that a coloured image resulted.

**Bath Photographic Society.**—November 8, Colonel H. H. Sealy presiding.—This was the first open meeting, and the Committee had invited all interested to be present. Mr. J. T. SANDELL, of the Sandell Plate and Film Company, Limited, gave a demonstration of the new films issued by the firm. The lecturer prefaced his demonstration with some particulars of emulsion-making, and pointed out the method by which he considered perfection in plates and films was obtainable. A series of transparencies were projected on the screen, illustrating very difficult subjects successfully treated. A number of prints of large dimensions were also shown. Having explained the details of multiple coating of a suitable transparent base, like glass, and the enhanced value of the principle as adopted in the new films, he proceeded to develop some of these, pointing out possible defects and means of avoidance. Many questions were asked and replied to, and at the close the lecturer was thanked for his courtesy in visiting the Society.

**Leeds Camera Club.**—November 15, Mr. W. J. Warren (President) in the chair.—A lecture, illustrated by lantern slides, was given by Mr. S. MARGERISON on the subject of

#### OLD CHURCHES AND THEIR INTERESTING FEATURES.

In the course of his remarks the lecturer said: The first thing a tourist seeks when resting at any out-of-the-way district is the church, whose associations are always interesting, its antiquity undoubted, and its various transitions through often troublous times clearly indicated in its predominant features. The subject was of great interest, far too much for any single individual to undertake to establish a permanent record of all which it might be advisable to produce, and the lecturer hoped that every photographer would, whenever opportunity arose, contribute his share by obtaining a record of any interesting old feature, without which, as time wore on, it might be lost. Beginning from the outside, and working from west to east, Mr. Margerison traced in succession the leading features dominating the structure, and their variations under different styles of architecture, from the ancient Saxon down to modern times. He showed Bottesford, with its stocks and whipping-post adjoining the church, indicating that the power possessed by the churchwardens of olden times had certainly considerably diminished since then. The church crosses, too, were interesting, as seen in the examples occasionally met with, which very often existed even before the church itself, and formed the only meeting-place of the early worshippers. The towers and spires were important features in almost all old churches. Claypole, with its fine spire; Earlsheaton, with its old Saxon tower; Rothersthorpe, with its saddleback top, and many others equally noted, were passed in view before the audience. The porches, windows, consecration crosses, the poor-boxes, with their three different locks, were dealt with, and many beautiful examples of the founts shown, these latter in nearly all cases at or near the entrance to the church, and so symbolising the entrance of the baptized into Christianity. As time wore on, pulpits began to appear, indicating the necessity of the priests having to personally expound their views or contradict their opponents; while the hour-glass, as found above some old pulpits, was an indication of a suitable time limit to their eloquence. The interior arrangements of the aisles, chancels, and other parts were in turn alluded to, and fully represented. The trend of all the architecture, said the lecturer, led to the central feature of the whole church, the reredos and altar, the emblem of Christianity itself.

**Newcastle-on-Tyne and Northern Counties Photographic Association.**—At the last meeting of this Association Mr. HENRY WADE, of Manchester, attended on behalf of Messrs. Wellington & Ward, and gave a most interesting demonstration of that firm's new stripping film. This new product of the Elstree firm has been so frequently described lately that it is only necessary to say that it forms quite a revolution in photography, and is adapted to a great range of work, from use in the roll-holder of a hand camera to making enlarged negatives. To the carbon printer or collotypist it will be of immense advantage, as, when stripped, it can be printed from either side without loss of definition. It lies perfectly flat and is very tough, and, with ordinary care, its manipulation presents absolutely no difficulty.

#### FORTHCOMING EXHIBITIONS.

1899.

November 24, 25. .... Longton and District Photographic Society.  
Thomas Mottershead, 43, Stafford-street,  
Longton, Staffordshire.  
" 27-Dec. 18 American Institute Photographic Salon (New  
York). Hon. Secretary for European Exhibitors,  
H. Snowden Ward, 6, Farringdon-  
avenue, E.C.



- December 7-9 ..... Hove Camera Club. C. Berrington Stoner,  
24, Holland-road, Hove.  
,, 11-Jan.1900 Huddersfield (Invitation). W. A. Beevers, Cloth  
Hall-street, Huddersfield.  
,, 27-30 ..... Borough Polytechnic Photographic Society. Hon.  
Exhibition Secretary, E. J. Hoar, 59, Hillingdon-  
street, S.E.  
1900.  
January 29-31..... Southsea Amateur Photographic Society. F. J.  
Mortimer, 10, Ordnance-row, Portsea.  
April 3-7 ..... Birkenhead International. C. F. Inston, 25, South  
John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Patent News.

THE following applications for Patents were made between November 6 and November 11, 1899:—

- PHOTOGRAPHS ON GLASS.—No. 22,136. "An Improved Method of Producing Photographs on Glass for Hand-painting Purposes." G. J. SERSHALL and A. F. BIDDLE.  
CAMERAS.—No. 22,195. "Improvements in and connected with Photographic Cameras." A. C. SMITH.  
SHUTTERS.—No. 22,225. "Improvements in Shutters for Photographic Plate-holders." Communicated by N. Bull. Complete specification. A. J. BOULT.  
ANIMATED PICTURES.—No. 22,289. "Improvements in Photographic Apparatus for the Production of Animated Pictures." H. OLIVER.  
CAMERAS.—No. 22,346. "Improvements in Photographic Cameras." Complete specification. F. A. FICHTNER.  
PHOTO-MECHANICAL PRINTING.—No. 22,350. "Improvements relating to Photo-mechanical Printing Plates or Colour Printing." Communicated by the firm of Meisenbach, Riffarth, & Co. J. WATTER.  
CAMERAS.—No. 22,358. "Improvements in and relating to Folding Photographic Cameras and to Plate and Film-holders therein." Complete specification. C. P. GOERZ.  
SENSITIVE COATING.—No. 22,370. "A New and Useful Process for Covering Plates or Rollers with a Photographic Substance Sensible to the Action of Light." E. ROLFFS.  
WASHING PLATES.—No. 22,371. "Improvements in Devices to be Used in Washing Photographic Plates or Films or the like." H. COVENTRY.

## Correspondence.

- \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.
- \* We do not undertake responsibility for the opinions expressed by our correspondents.

### SOME PRINCIPLES OF DEVELOPMENT.

To the Editors.

GENTLEMEN,—Mr. Micklewood criticises the summary of my lecture given on p. 716. This summary must be taken as another man's impressions in short of what I said at the Camera Club. I have in no way revised it, and should have to do so in some important respects before I could endorse it. At the same time any imperfections probably arose from the fact that I spoke extempore and rapidly.

I doubt whether it is possible to condense the principles with sufficient accuracy in a few short paragraphs. For instance, although I can endorse the general principle marked "a," I expounded in my lecture the very exceptions which Mr. Micklewood brings forward as a criticism on the principle, and in fact Mr. Micklewood omits quoting that part of the summary which indicates exceptions.

I have revised a full report to be published in the Transactions of the Camera Club. No doubt there is matter in it open to criticism, but until that is published it is idle to discuss the paper.

Mr. Micklewood's views on the progress of development in over-exposure are not borne out by exact trials. In any exposure, over or under, the contrast between any two tones which have a difference of deposit increases with length of development up to a certain limit, although with some plates (prone to fog) that limit is reached before maximum density in the high lights is attained. To obtain this maximum contrast with an over-exposed negative, the negative is very dense, and takes long to print. Most photographers stop the development of over-exposures long before maximum contrast is attained.—I am, yours, &c.,

Hereford, November 18, 1899.

ALFRED WATKINS.

### AUTOMATIC SLIDE-CHANGING.

To the Editors.

GENTLEMEN,—Your issue of November 17 contains a letter from Mr. W. D. Welford, in which he refers to my patent automatic slide-changer. I am pleased to know that such an expert as he was so impressed with it, especially when I remember that it was in very crude form when I,

though not an *employé* of the Dunlop Tyre Company as Mr. Welford supposes, showed it to him in January 1897, and fitted it up for his lectures.

Since that time the changer has been perfected, and by next season I hope to have it placed upon the market in forms which will be suitable for any of the present-day lanterns, thus enabling lecturers to have the means of changing their own slides at the exact instant required without the usual signal to the operator, which I think you will agree is objectionable and unsatisfactory.—I am, yours, &c.,

ALFRED SUMMERS.

Marlowes, Kilmainham, Dublin, November 20, 1899.

### "THE ABSENT-MINDED BEGGAR."

To the Editors.

GENTLEMEN,—It is a feature of the photographic press, that for a penny or twopence you can obtain all the general information contained in the paper, and also as much further special information as you like to ask for.

Last week four papers, between them, gave free special information to 180 correspondents, which may be taken as a fair average number.

If for, say, twelve weeks every querist sent a postal order for one shilling with his questions, he would receive value for his money, and a total sum of 108*l.* could be handed over to the War Funds.—I am, yours, &c.,

P.

[Our correspondent's suggestion is an admirable one; and, if any of our readers care to forward us their shillings, we shall be pleased to transmit them to the editor of the *Daily Telegraph*.—EDS.]

### THE BUSCH LENSES.

To the Editors.

GENTLEMEN,—I have pleasure in informing you that, at the recent photographic Exhibition held at Stuttgart, Busch's lenses were awarded a silver medal, an indication that, notwithstanding the firm's great age, which with the advent of 1900 will have reached 100 years, they are still in the forefront.

It is interesting to note that during this year three of the workmen have celebrated their jubilee of employment in the factory.—I am, yours, &c.,

HENRY F. PURSER.

33, Hatton-garden, E.C., November 20, 1899.

## Answers to Correspondents.

- \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.
- \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.
- \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

SPOTS ON MATT-SURFACE PRINTS.—Will "Photographer" send us his address. A letter awaits him.

S.—Of the two we should be inclined to select Mr. Welford's, owing to the large amount of successful work he has done with it.

PERCY LYNE (Hull).—We cannot undertake to answer questions by post. It is, moreover, a rule of ours not to mediate in a dispute unless both parties agree to abide by our opinion. Hence we are unable to help in the present matter. We return you the prints.

HARRINGTON & Co.—The machinery for making liquid air is supplied by Brin's Oxygen Company, of 69, Horseferry-road, London, S.W. You are, doubtless, aware that, owing to its rapid transition to the aeriform condition, it cannot be conveyed far from the place of origin.

AGENTS FOR ARISTO PAPER.—R. G. says: "Would you kindly answer, Is there an agent for Aristo paper in England? If so, where could I get some?"—Aristo is a term used both on the Continent and in the United States. If you specify the particular brand of paper to which you refer, we have no doubt one of the trade houses will obtain it for you.

PRESERVING A POTATO.—W. A. GAIN writes: "To 'CURIO.'—A five per cent. solution of formalin—one part of the commercial article to seven of water—is all that is required. I have a potato which I preserved in this manner above two years ago. It is in perfect preservation. Nearly all delicate organic substances may be preserved in this medium without loss of colour."

ACTION OF METOL ON THE SKIN.—SUFFERER writes: "1. Will you kindly inform me what is the date in the JOURNAL in which you have something to say about the evil effects of metol on the skin? I have been suffering recently from this cause, somewhat severely, and I should be for ever grateful to you if you could tell me what to do in such a case. 2. Will you also be good enough to inform me when Mr. Birt Acres' new light for lantern work will be ready?"—1. Better consult a medical man. Metol has an ill effect on some persons, and they have wisely given up its use, or work in finger stalls. 2. We cannot say; write to Mr. Acres, Northern Photographic Works, Barnet, N.



**RIGHT TO NEGATIVES.**—J. W. C. Yes, you are quite right; the three negatives belong to you, and not to the sitters. But you are quite wrong when you say, "Surely one can do as he likes with his own property." You cannot use the negatives for purposes of your own against the wish of the sitters. If they object to enlargements from them being shown, they can restrain you, by law, from exhibiting them, and, probably, also obtain their forfeiture or their destruction.

**DRYING OIL ON PHOTOGRAPHS.**—"METEORS" asks: "Can you tell me what will assist the oil to dry on photographs after they are finished? I am well aware that the damp weather makes against the drying, but I have an impression that painters use something to help the drying."—A drying oil is sold by all artists' colourmen which dries quicker than ordinary linseed oil. "Dryers" added to the paint also facilitates the drying. That can also be had from the colourmen.

**RED TONES ON MATT PAPER.**—TONING writes: "Would you kindly give me a formula or tell me where I could find one, for obtaining red tones with matt paper, P.O.P. for preference."—P.O.P. is not a definite article; all are not alike. It is possible to obtain tones on one that are not possible on another. The redder tones are secured by slight toning only. Treating the prints with a solution of common salt facilitates the securing of reddish tones, when the toning is stopped at an early stage.

**CLEARING SILVER BATH.**—J. CRAWLEY says: "During the last two or three weeks I have, from time to time, been sensitising a little albumenised paper. The bath became of a brown colour, and, as I read that it could be cleared by the addition of kaolin, I procured some. On adding it to the bath a violent effervescence took place, and a good deal of the solution was wasted. Is this the way that kaolin acts?"—No. Evidently what you have been supplied with is not kaolin at all, or it would not have behaved in that way. Kaolin causes no effervescence whatever.

**CLEANING GLASS.**—N. CROWE writes: "Will you be good enough to tell me the easiest way to clean off spoilt negatives? I, like most others, have a large number of spoilt negatives (failures) which I should like to clean off so as to use the glasses as covers for lantern slides."—The simplest way is to soak the plates in cold water for a day or two, and then put them in hot water, when the film will readily dissolve off. If, however, the negatives were developed with pyrogallie acid, or were alumed, they would be a little more refractory, in which case the services of a nail brush may be invoked.

**LEARNING PHOTOGRAPHY AS A PROFESSION.**—PATER writes: "I have a boy who seems to have a taste for photography. I shall be glad if you can inform me the best way to get him forward in it, so that he can get employment, as I am told that good salaries are given."—The best way will be to article the lad to a good house, but we should advise you to hesitate before doing so. The labour market at the present time is much overstocked with proficient hands, and is likely to be for many years to come, we fear. We think you have been misinformed as to the salaries that are generally paid nowadays.

**PHOTOGRAPHING SNOW AND HOAR FROST.**—C. W. E. says: "I am anxious, should there be an opportunity this season, to take some snow and hoar-frost photographs. Please tell me whether any special rules are to be observed. Are ordinary or rapid plates best? Can falling snow be successfully photographed?"—There are no special rules to be observed beyond judgment. Give a full exposure, and develop tentatively. We should employ plates of medium rapidity ourselves. We doubt if falling snow can be successfully photographed—that is, catching the flakes as they fall. When it is snowing, the light is generally very non-actinic.

**SPOTS ON PLATINOTYPE PRINTS.**—C. H. ELLIS says: "Can you help me with the enclosed? All my work in platinum comes out spotty, as by the enclosed specimen. I have kept the paper and pads dry, as usual. I have hitherto been successful, but cannot now master the matter. I should be much obliged if you could assist me in any way. I am working in London on the roof of a house. I can get them clear in the summer, but not this time of year."—The spots on the print enclosed appear to be due to particles floating on the surface of the developer, and so preventing its action on the print where the spots are. See that there are no particles on the print when it is developed, and that there are none floating on the solution when the print is applied to it.

**VARIOUS.**—CONRAD asks: "1. Will you advise me how to use the ortol developer, as described in your issue of the 10th inst., for bromide paper; whether a clearing bath would be necessary, what strength the fixing bath should be, and how long they should be fixed? 2. What is the best make of transparent colours for P.O.P. prints? 3. What is your opinion of radiotint, as supplied by Messrs. Houghton?"—1. The same as for plates, except that it should be used a little weaker, and, perhaps, with a little more bromide. But something will depend upon the character of the paper. All papers are not alike. No clearing solution is necessary. 2. Ordinary transparent water colours, such as you may obtain from Newman's, Soho-square. 3. They are for colouring photographs and are transparent, also easily applied.

**REDUCING AND INTENSIFYING PLATINUM PRINTS.**—PLATINOTYPE asks: "Would you kindly let me know if there is any method of reducing over-exposed platintype prints, and intensifying under-exposed prints? I have several 12x10 prints (platinum) which I should like to save if possible. Any formula on this subject will greatly oblige. Thanking you in anticipation."—If the prints were ours, we should make fresh, and that is the practice with professional photographers, and it is far less trouble than attempting to vamp up ill-timed prints. Furthermore, they are of little use in the end. The over-printed ones may possibly be reduced by treatment with dilute nitro-hydrochloric acid, but they would probably be faint prints when done. If there is no detail in the lights of the under-exposed ones, no method of intensification can, of course, bring them out. Better make fresh prints, and not waste time.

**STUDIO BUILDING.**—STUDIO says: "Enclosed is plan (not drawn to scale) of proposed studio, which I would be very grateful to have your opinion on: First, as to how far to carry glass up the roof? Second, would nine and a half feet of glass be sufficient from beginning to background end? A large triangle beam, as shown in plan, comes exactly in the centre of the room and is the roof's principal support, the builder saying it could not be removed. If you consider the amount of glass sufficient, as shown in plan, I think the base of the triangle could be raised to eight feet, resting on pillars at each side of the room as shown."—As the plan is not drawn to scale, we scarcely follow it. We should prefer the height from floor to eaves raised a foot at least. Eighteen feet from floor to ridge seems to us an unnecessary height for so small a studio. Nine feet six of glass will be sufficient, but it should start about four feet from the background end. We may say, however, that we fancy we do not fully realise the proposed structure from the sketch.

**VARIOUS.**—VARNA writes re answer given November 3: "1. The gelatine, glycerine, &c., adhesive compound on p. 1062 of ALMANAC, used by me for films, was ascribed to Fol by Captain Abney. 2. I see on p. 685 of JOURNAL, No. 2060, that Mr. Bolas seems to recommend lead plaster for that purpose. The limp plaster would probably be inconvenient. Would not lead ointment spread on cardboard answer the same purpose better? But would not the presence of some lead or grease on the film be detrimental in the developer? 3. My queries 1 and 2 (p. 704) were not so much as to the relative permanence of gold or uranium toning as to know if toning after fixing gave equally permanent and good results as toning before fixing. 4. Would zinc plaster or ointment do as well?—1. Some mistake; no such adhesive appears on the page mentioned. Send the formula you have used, we can then express an opinion. 2. We have not tried it, but should expect that the grease would prove an inconvenience. Why not try it yourself, and see if it answers your purpose? 3. If gold toning is employed, we think there would not be much difference. Uranium toning is always after fixing. 4. We can only answer this as we did query No. 2. The lead plaster might be spread direct on to thick cardboard.

**REPRODUCTION.**—C. F. A. writes: "I want to reproduce a half-plate negative. 1. What would be the best way to do so? 2. Would you recommend making the transparency on half-plate by contact printing, or on quarter-plate by reduction in camera? 3. What is the best kind of plate to use for the transparency? 4. I use an 8x10 camera with a half-plate one as a daylight enlarger, but as the lens is eight-inch focus, the half-plate camera I use will not extend far enough to copy half-plate same size. Would I get as good a result by reducing to quarter-plate for the transparency, and then enlarging to half-plate for the negative? 5. Is it the usual method of professionals to make the transparency by reduction? If so, what kind of plate do they generally use? 6. Could I make efficient enlargements with a daylight enlarger, such as I have mentioned, by using ordinary paraffin lamps with 1½-inch burners? 7. If so, what would be the best way to place the lamps so as to illuminate the negative equally? 8. As daylight is very unsteady, is there any means of testing the light to ensure correct exposure?"—1 and 2. By contact printing. 3. A slow plate or a photo-mechanical one. 4. No. 5. Slow plates, but often the transparency is made by the carbon process by professional photographers. 6. Yes, by interposing two or more thicknesses of ground glass to equally diffuse the light. 7. At equal distances apart. 8. The best way, in practice, is to make a trial exposure.

**LANTERN-SLIDE MAKING.**—LANTERN SLIDES writes: "I am starting to make some lantern slides, and find some difficulty with exposure by gaslight. I did not get a properly exposed slide even with fifty minutes. I was reducing 10x8 negatives with an optical doublet of about seven and a half inches, stop f-32. I had succeeded in getting fairly good results during the daylight in sixty seconds with cardboard reflector and ground glass in front of negative with a view of equalising the lights. I used an ordinary enlarging camera, large enough for 15x12 plates, but I am making a box with a fixed focus for reducing half-plates, using the seven-and-a-half-inch lens. I should have thought f-11 stop should have been sufficient. I placed the lens with the front combination towards the negative, and back of lens nearest the lantern plate (a Mawson's). I cannot find, in any of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANACS I happen to have by me, an article to help me in my difficulty, hence my troubling you direct. I may add that I used hydroquinone developer."—F-11 is quite small enough, even unnecessarily small. The lens was rightly placed. We cannot account for the long exposure found necessary unless it be that the gaslight was very feeble or it was placed a long distance from the negative. We should advise you to use a rapid lantern plate, and place the apparatus nearer to the source of light, and perhaps increase the size of the burner.

**AN ASSISTANT'S DIFFICULTY.**—A B C says: "A undertakes to teach B photography, and allows B 1l. per week. B, in return, gives A his services as an animal painter and assists in photography, and signs an agreement for three years not to open or assist within twenty-one miles of C. A now says, B signed an agreement for his (A's) lifetime, and not to open or assist under a penalty of 500l. B had no witness or copy; but there were two young ladies in the room adjoining who heard B say he would only agree for three years. After the three years had expired, A wanted B to sign another agreement; B declined to do so. B is still in A's employment, and has been since 1876. In case the above is binding, could B's wife open in her name and B assist?"—Without seeing the agreement, or a copy of it, it is impossible to give an opinion. A radius of twenty-one miles, unless under exceptional circumstances, seems to us a wide one, and might be ruled in a court of law "an undue restriction of trade." An agreement for a lifetime, we should not think was, if made, binding in a court.



# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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## THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1900.

Edited by THOMAS BEDDING, F.R.P.S.

THE Thirty-ninth Annual Issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC is now published. The volume reaches the unprecedented total of 1516 pages, and is the largest yet produced. As hitherto, it is issued in paper covers, price 1s.; cloth bound, 1s. 6d.

The frontispiece is a bromide print by Messrs. Wellington & Ward, of Elstree, from a negative by Mr. H. Walter Barnett, of No. 1, Parkside, Knightsbridge. Many other illustrations are also given in the text matter.

Eighty articles, on a great variety of subjects interesting to photographers, and contributed by the principal authorities of the day, form a feature of the volume. The other sections are "Epitome of Progress during 1899," "Patented Inventions of the Year," "Miscellaneous Information," "Practical Notes and Suggestions of the Year," which, with the large collection of formulæ, tabulated matter, and a great deal of other information of use to all photographers, places at their disposal,

for constant reference, a fund of technical knowledge which is not to be found in any other photographic annual.

\* \* The 1899 Edition of the Almanac (20,500 copies) was entirely exhausted within three months of publication—a fact without precedent in the history of photographic publications

## EX CATHEDRÂ.

THE subject of the right to the negative has cropped up again in a case which came before the Yarmouth County Court a few weeks ago. The Judge is taking time to consider whether the negative belongs to the sitter or to the photographer. In order to assist our readers to a knowledge of previous decisions, we last week devoted an article to the enumeration of a number of cases in which it has been decided by Judges of the High Court and others that, in the ordinary relations between photographer and sitter, the negative, subject to certain restrictions, is the property of the former. On the ground of what may be termed trade custom, the recognition of the fact that property in the negative resides in the photographer and not the sitter is so firmly established and obvious that we do not now expect a judicial expression of opinion to the contrary. If not opposed to law, it would be entirely out of harmony with equity, common sense, and precedent.

\* \* \*

STILL, the possibility of the Yarmouth Judge coming to a decision adverse to the photographer has to be borne in mind, and the resulting consequences taken into consideration. If it be laid down at this late date that the negative is the property of the sitter, the immediate effect might be to disturb the relations between photographers and their clients; but we cannot think that such a verdict would long remain unneutralised. It would be the instant duty of photographers to have a case tried before the higher Court, even to the ultimate extent of invoking a House of Lords judgment; for, if the photographer's right in his own negatives no longer exists, the stability and prosperity of the profession will be shaken to its very foundations

\* \* \*

WE call the attention of professional photographers all over the United Kingdom to the fact that they are menaced by



dangers of considerable gravity. Next session in all probability the House of Lords will be again asked by the artists and their publishing friends to rob photographers of their copyright in their own work; and at this moment we have the somewhat disquieting spectacle of a County Court Judge finding it necessary to take time to consider whether a photographer's negative made by the aid of his own material and skill is his property or somebody else's. We cannot possibly understand why there should be a doubt in the matter, any more than in the case of a painter who makes sketches for a portrait; a printer who sets types for the book he prints; an architect who makes plans for the house he is commissioned to design. But it is really not necessary to argue the matter further. We hope that, in the event of an adverse decision at Yarmouth, the Photographic Copyright Union will take steps to have it immediately wiped out or neutralised.

ON Monday afternoon last, at the offices of the Platinotype Company, Bloomsbury-street, London, a practical demonstration of the new oxy-magnesium light for portraiture, to which we referred last week, was given before an assemblage of well-known photographers. To the description of the system which we have already given the following additions may be made: The apparatus consists of a small electric battery; an oxygen gas-container on the well-known "gasometer" principle, and a bell jar, shielded by a concave radiator, to which oxygen is admitted from the holder. In the jar of oxygen a couple of strands of magnesium ribbon are suspended, and these are electrically fired by two wires from the battery. Just sufficient oxygen for the combustion of the oxygen is admitted to the bell jar, the supply being automatically controlled.

ON ignition of the magnesium, a light of the most intense brilliancy is obtained, and it is sufficiently actinic to allow of cabinet portraits being taken in a second or two. At the demonstration, test subjects, in the shape of dark and fair sitters, were photographed, the exposures being two and one seconds respectively, and the developed negatives proved to be exceedingly successful. As a result of the demonstration, we are convinced that the light has a very great future before it. The entire apparatus, which is about six feet high, may be comfortably stowed in the corner of the studio, the light is adjustable to any desired angle, and the weight, plus the water in the gas-holder, is only some forty pounds. A foot or two of oxygen and a few ounces of magnesium ribbon are sufficient for hundreds of exposures, so that, when once the apparatus is obtained, the cost of working it is exceedingly small. We are persuaded that in this ingenious adaptation of oxy-magnesium illumination to the purposes of studio portraiture the Platinotype Company have hit upon an idea which will be highly appreciated by professional photographers anxious to possess a cheap and efficient system of artificial lighting.

ALTHOUGH not a novelty in the country, the holding of a one-man exhibition by a provincial photographic society is a sufficiently rare and noteworthy event to call for prominent reference. We are informed that the Tunbridge Wells Photographic Society are to have an Exhibition of the collection of Eastern photographs by Mr. E. R. Ashton, which has recently been on view at the London Camera Club. The photographs

will be shown at Tunbridge Wells from the 6th to the 13th instant inclusive. We hope that Mr. Ashton's very fine series of interpretations of Eastern life by means of photography will attract a large number of visitors, to whom such unique studies cannot fail to give pleasure and delight.

FROM Messrs. F. & R. Speaight, photographers, of 178, Regent-street, W., we have received a specimen of the "Speaight Photo Christmas Card, 1900." This is a neat and tasteful production, which consists of a booklet,  $4\frac{1}{2} \times 3$ , artistically designed, comprising a primrose cover, having embossed in the centre of the first page a pattern of a miniature frame for mounting the photograph in, and "Christmas Greetings" stamped in mauve in the bottom right-hand corner. The four-page mauve inset, which is tied to the cover with dark mauve watered silk ribbon, has stamped on its third page a suitable greeting and space left for autograph. While congratulating Messrs. Speaight on their enterprise, we also desire to express surprise that such a comparatively few number of our professional readers engage in the production of Christmas photographic cards. For years we have been urging photographers generally to take up this interesting and remunerative branch of business.

#### BRONZES IN PHOTOGRAPHY.

THE present, for reasons to be mentioned, is not an unsuitable time for bringing to light a chapter of what, in photography may now be termed ancient history. It is over twenty years since—simultaneously with others, as events showed—we engaged in an investigation to discover the cause of certain mysterious spots which were prevalent in the mounted prints of a certain photographer, but which proved to be by no means confined to his prints, for it seemed as though an epidemic of spots were abroad. No chemical tests were capable of putting us on the right path; but, the moment we used the spectroscope on the flame from the ignition of a number of these minute spots cut out from the surrounding paper, the key of the enigma was found in the presence of copper. Not to make a long story of the further steps taken, it will suffice to say that each spot had an extremely small nucleus of metal, eventually proved to be a particle of "bronze powder." All the injured prints were mounted on so-called "gold-printed" mounts, the gold being merely bronze powder, and quite innocent of the noble metal itself. For scores of years past gold printing has been done by printing first in ink, leaving a sticky surface, with or without an admixture of bronze powder, and then giving the metallic appearance by dusting or brushing bronze powder over the whole surface of the paper or card whereon the printing was executed. When the non-adherent powder was brushed away, a very golden-looking surface was left behind; but, at the same time, a certain amount was left behind, and, by holding the printed surface at an angle with the light, it was not difficult to discern the metallic particles in greater or less number all over the paper or cardboard.

It took years of argument before it came to be a generally accepted fact that gold-printed mounts should be "anathema maranatha" for those who wished to preserve a reputation for permanent work. The vested interests of the printers were in danger, and they would not admit that their mounts could possibly be at fault. Then, when facts proved too strong for them, a very firm stand was made in the interests of a



favourite style with so many photographers by the statement that a new method of printing had been adopted which obviated all possibility of stray particles of metal being distributed over the prints.

All this, we have said, is ancient history, but we find that there is now upon the market an alarmingly large number of mounts which, though not printed in "gold," are yet equally fatal to silver prints by reason of a "gold" line—"gold-bronze," of course—placed round the space allotted to the print. Now, we would warn every one of the younger race of photographers, who have learnt their photography since the bronze disease became practically extinct, and by whom therefore the intensity of its incidence can scarcely be understood, that if they mount silver prints, more especially, perhaps, albumenised prints, the chances are very greatly in favour of white spots eventually making their appearance on their pictures.

We believe these mounts were devised with the idea of their being used for platinotype or carbon prints, and, if their use is confined to that purpose, no harm is likely to result to such prints. But it is to be remembered that, when these mounts are passed through the rolling press, some of the bronze particles are likely to become detached, and possibly adhere to the polished metal surface of the press, from there to be attached to some of the next lot of silver prints that are passed through. Hence the press, after being used for such mounts, should be sedulously and jealously cleaned before passing a print through. Before leaving this practical aspect of the subject, we suggest an old experiment as an object-lesson on these possibilities. Let a waste print be pasted over the gold of a gold-lined or gold-lettered mount, and the mounted print left in a damp place for a month. At the end of that time the maleficent properties of the metal will be evident by its having acted, through the substance of the paper, on to the surface of the print, and entirely bleached that portion of the print lying over it, the printing or lining showing light on a dark ground as a result of the destructive action of the metal.

The only way to use a bronze powder safely is by protecting it from being detached by imbedding it in a varnish of some kind. This is scarcely practicable for the printer, but, when the bronze is required to be used for decorative purposes, whether to patch up or ornament a frame or cover a surface, the most efficient mode is to suspend it in a celluloid varnish and apply it with a brush. Such a varnish or gold paint is now to be had commercially and economically.

Some light on the chemical aspect of the matter—the mode of action of the bronze in bringing about a destruction of the image, is thrown by some recent investigations on explosions of bronze powder—aluminium in [this case—that have taken place in the mills where the sheets of thin metal are ground up between rollers to make the aluminium bronze powder. It was found that this powder was capable of absorbing 1.4 per cent. of aqueous vapour from the air, and that it was further able to decompose the water so absorbed, the liberated gases being the source of the explosions. It is very probable that something of the same sort occurs with a print, and in the presence of these gases and of moisture it would be strange if the print did not suffer.

Before ending our remarks, we may point out that aluminium bronze gives an excellent light when used for flashes in lieu of, or by admixture with, magnesium powder, and it is also capable of explosion when mixed with potassium chlorate.

#### ORTOL, WHOLESALE DEVELOPMENT, REPEATED USE OF DEVELOPER, AND OTHER THINGS.\*

Pyro cannot come up to the scratch with ortol as regards all-roundness, to use a term associated with pyro, as, for one thing, it is not a good developer for bromide paper. Probably I shall be told, as of yore, that it can be used for this purpose; but "can" and "is" are two very different words when applied to the commercial side of photography. I assert that pyro is not used for the development of bromide prints, whether direct or enlarged, except as a scientific experiment or a little diversion in procedure to fill a spare half-hour at a society meeting, whereas ortol will come greatly into favour ere long for that attribute alone. Indeed, I should not be even a wee bit surprised should some old hand stick to his beloved pyro for negatives and adopt ortol for bromide prints. Therefore, with a developer that appears to be suitable for negatives, lantern slides, transparencies, and bromide prints, we have every reason to call it "all round."

With most developers, except pyro, it is possible to warm up the tone of bromide prints by increasing the exposure and diluting or restraining the solution; but with ortol this can be done more simply, by leaving out the sulphite of soda altogether and adding just a little more of the other restrainer.

Since writing the first portion of this article I have made some little experiments with regard to the action of the sulphite of soda. The old argument that sulphite is not a restrainer because it can be used alone for development with the reagent, whatever it may be, was the one I wanted to verify or disprove with ortol. I utilised a home-made screen with pieces of paper, each square representing a density of one to sixteen, the first square being a single thickness of paper, No. 2 two thicknesses, and so on up to sixteen.

*Experiment No. 1.*—Two plates were given the same exposure exactly. One was developed with a normal solution of 1 part ortol,  $\frac{1}{2}$  part soda,  $\frac{1}{2}$  part sulphite, 10 grains bromide. The other with the same proportions, but leaving out the sulphite altogether. With both development was continued until square 13 could be just discerned. The result as regards time was that the second plate (without the sulphite) took slightly under half the time of the other; and, as regards gradation, the No. 1 (with the sulphite) was considerably deeper—i.e., more contrast.

*Experiment No. 2.*—Two plates were again used with the same exposure. No. 1 was started in 1 part ortol,  $\frac{1}{2}$  part sulphite, and 10 grains bromide, thus leaving out the carbonate of soda altogether. No image whatever appearing in 30 minutes, the soda was added and development completed. No. 2 plate was treated in the same way, but was allowed to soak for 2 hours, and then no image appeared, and this in turn was developed by adding the soda. The difference in time was not so marked, although No. 2, the plate soaked longest, certainly did take longer to develop. The result, however, as regards contrast, was much the same as the first experiment, that is, the plate longest in the plain ortol and sulphite showed greater contrast.

*Experiment No. 3.*—For this I took three medium rapidity plates, and by previous experiment found out the exposure necessary to get a fair amount of over-exposure, sufficient, in fact, to necessitate the use of considerable restrainer. No. 1 was developed in the normal strength of solution with the bromide increased to 20 grains. No. 2 was developed without bromide, but with the sulphite doubled in strength. No. 3 was developed with both the 30 grains of bromide and the double strength of sulphite. The results showed No. 1 and No. 2 to be as near alike as possible, whilst No. 3 showed greater contrast. In this case I consider Nos. 1 and 2 had each 1 part restrainer whilst No. 3 had 2 parts.

Now, the application of these experiments is to remember that, when using sulphite of soda, to restrain the colour of the image, for that is exactly what it does, it does not alter, it restrains, we are at the same time restraining development in the ordinary sense, and allowance must always be made for this. For instance, with a very under-exposed negative, in order to get the utmost out of it, the matter of colour of the image must be left out of consideration altogether and the sulphite omitted entirely. To take the other extreme, to make the best of gross over-exposure, plenty of sulphite should be used, and, if it is desired to get a brown image in that case by reducing the sulphite, then the bromide must be increased.

I think the foregoing points pretty clearly to the modifications possible when using bromide paper as regards the resulting colour of the print, and I have gone into it rather fully because the effect of the restraining action of sulphite must be then seriously taken into account. Given two equally exposed prints, it would not suffice to leave out the sulphite, in

\* Concluded from page 712.



order to get a brown tone, if the two results are to match as to gradation, for in this case part of the restrainer also has been removed, and must be replaced by an increase of bromide.

For the development of bromide paper I advise the following proportions, viz., 1 part ortol,  $\frac{1}{2}$  part soda, 1 part sulphite, about 20 grains bromide, and 1 part water. For warmer tones, reduce the sulphite and increase the bromide. That is about as clearly as I can put it. I do not imagine that the small quantity of hypo used has very much effect, but, if the hypo solution should be kept separate, by all means leave it out. As to ortol's keeping power with bromide paper, I have already referred to this, and of course I mean a mixed solution. I have repeatedly developed twenty prints one after the other in two ounces of solution, though care has to be taken to drain the prints fairly well before washing in order to avoid unduly lessening the bulk of solution. How often it may actually be used I have not tried, deeming twenty to twenty-five prints a sufficient test for practical purposes.

During the whole time I have used ortol for bromide paper I have never seen the slightest appearance of stain, and I will candidly confess that with no other developer that I have previously used has such complete immunity been my lot, at all events. Staining has always come sooner or later, even when using comparatively freshly mixed solutions.

During the course of the article I have dealt with lantern slides and transparencies as different items, and they are so in one respect, viz., the result necessary to obtain. A lantern slide must be of a certain degree of density to make a good appearance upon the screen, with a fairly powerful illuminant in the lantern. And that degree of density or contrast is considerable. On the other hand, a transparency for reproduction or enlargement can be, and perhaps should be, very much weaker in contrast and a different type altogether. And so, although lantern slides and transparencies are the same as regards material, they differ in treatment to accomplish a certain result. In an article, therefore, the object of which is to treat ortol fairly exhaustively, the difference between these two is sufficient to justify a distinction.

The softest and most delicate transparencies may be obtained with ortol by the omission of the sulphite and dilution of the developer with water; whilst, on the other hand, by setting to work the other way brilliant lantern slides are most easily obtainable, either of a black, warm black, or brown tone. The procedure is practically the same as with bromide paper.

The fact that ortol will give either black or brown deposits, therefore, becomes a factor in lantern-slide making of considerable importance. Not only can we regulate the density but also the colour, and, with these two powers, it is possible to turn out slides suitable for any illuminant. Light does not pass through a brown deposit quite as easily as through a black, even given the same density, if it is possible to gauge density under these conditions without the test of light. I mean if it is possible to say two slides are equally dense without passing light through them, because, as soon as we vary the strength of that light, the relative proportions of a black and brown image will vary.

Now, I know of no other developer that will give such a range of colour with normal exposures. Pyro gives usually warm black tones, whilst others, such as hydroquinone, give grey-black. Neither will give both, as ortol will and does. I am now, of course, speaking in a practical fashion, not of elaborate experiments to get a grey-black tone with pyro. It might be done; I do not say it is not possible, but it would be going out of the way, whereas with ortol one tone is as easy as the other, and easier. There appears to me, however, also a further difference, the brown tone of pyro on a lantern slide is more of a universal stain than an actually brown deposited image. This should make a grey-black colour with pyro an easy matter, only it doesn't.

Leaving, however, some of these debatable matters, there are many subjects that are better rendered in monochrome by a brown or a warm black as compared to the cold grey-black. If we want any proof of this, we have only to remember how often wet-collodion slides are toned to get away from the crudity of the natural colour of the process. Almost all landscapes are truer to nature in a warm tone. We have, of necessity, to translate the rich greens and browns into a much colder tone, but in making them absolutely black we overshoot the mark. We see a slide representing a leafy lane in June, the leaves on the trees all tingling with the warm greens reflected by the sunlight; in the hedgerow are wild flowers, and at the side perchance a rose-covered red-tiled cottage. We have to reproduce all this in practically one shade, black to grey according to density, and clear glass for the white, blue, and lighter colours. A brown tone gives a closer approximation all round.

Of course, this can be overdone. I was once shown a rather striking

group of grimy coal miners leaving work, the foreground being coal dust, with, just behind, a huge heap of refuse from the pit, and coal stacked, whilst for background the blackened coal-grimed shafts and chimneys kept watch and guard. The slide, however, had been toned a rich ferrid-cyanide red, a crude colour fit only for the representation of that place we are occasionally told to go to.

To turn now to the item of wholesale development, I have for many years been an advocate of not only getting development done as soon as possible, but have claimed an advantage in using a large tray and developing as many plates at a time as possible. I have never been able to understand, probably due to my ignorance, where the fun of painstaking development comes in, unless it be necessary. We can do so little with our developing solutions—and that I stoutly maintain—that, after selection, and arrangement, and exposure, nothing interests me until I begin work again on the finished negatives. These delirious little joys we read about of adding two more drops of bromide, or three and a half minims more of accelerator, have never been mine, at least, not for the last twenty-five years or more. Except on rare occasions, development, to me, is merely a necessary evil, it is work, and work only. If my plates would come out of the camera developed, fixed, and dried, ready for working up or printing from, I should be the more pleased. All the loving little titivations we hear of, dabbing, patting, and breathing on the plate, and, in fact, all the little dodges that our photographic penny-a-liners run so frequently through our periodicals, possess no attraction for me. I want the mechanical operations of photography done with as soon as possible, and development, with me, is a mechanical, uninteresting occupation.

How many times I have been attacked for what has been termed slipshod plate spoiling I cannot count; people used to be horrified at my putting six, eight, ten, or twelve hand-camera shots into one dish. A good deal of this horror has now vanished, because it is becoming gradually recognised that that I have maintained for years that we can modify but very slightly in development, and that the safest way is to modify in the exposure. If the worker will trouble over the duration of his exposures, he need not worry his head about development.

No; careful exposure is what is wanted, and then the plates can be developed in a bucket by the bushel.

How many series of plates are exposed at the same time or under equalising conditions? Many thousands. Take the every-day professional: he may have one or two tough jobs, but the best part of his work, he knows, is fully exposed. Even take the amateur with an exposure meter who develops a trial plate; he could put all his others into one dish. Or take the case of making a series of contact lantern slides; how easy it is to get a hundred or so all properly exposed. In fact, in many tasks that we undertake it is the easiest possible thing to get a whole lot of plates which will develop absolutely right in one strength or proportions of a developer. To most of us, whether professional or amateur, such a time comes, and when it does, I repeat, wholesale development gives a better average result.

In my own practice, I find it pays, whenever a large number of prints or slides are required, to arrange the negatives according to density, exposing all first and developing in dozens. I certainly do not lose more than three per cent., and, if exposed and developed singly, I should lose more.

The continuant power of ortol is a great help in wholesale development, as plates can be placed into plain water to continue, whilst others are gone on with in the developer.

In conclusion, I hope enough has been advanced in the cause of ortol to lead to an earnest trial of it by my brother workers.

WALTER D. WELFORD.

NOTE.—As in two makes of a developing agent there may be different qualities, I ought to have stated that all my experiments have been made with Ortol-Hauff.

#### TEACHINGS OF DAGUERRETYPE.\*

THE TRAIL-TAYLOR MEMORIAL LECTURE.—No. II., 1899.

THERE is little doubt, therefore, that iodine was given off under the influence of light in presence of an iodine absorbent. It may be noted that, in all these cases, the parts of the iodised silvered glass that had been in contact with the iodine absorbent surfaces were transparent, while those in contact with the mica showed distinct cloudiness or opacity, though enclosed and protected from the air.

\* Concluded from p. 755.



Scholl then argues that, if the clouding be due to loss of iodine during exposure, it ought to be less or disappear altogether if the plate is exposed in the vapour of iodine. He found, however, that, on the contrary, the plate clouded much more readily under exposure to light in the iodine vapour than it did in the air. The opacity, therefore, is not due to loss of iodine, and the action of the collodion or varnish in hindering it must be due to its preventing the access of air to the film. The change in the iodide must consequently depend upon the nature of the gases in which the plate lies during exposure.

[The occurrence of the clouding in the cases above noted, when the iodised films were exposed in contact with mica, may, I think, be explained on Scholl's theory by the iodine being first given off and then resensitising the film, as if it had been exposed in the vapour of iodine.]

Experiment showed that hydrogen and nitrogen had absolutely no effect in producing the opacity. In oxygen, however, it was produced rather more quickly than in air, and it was evident that oxygen is the active agent in the change.

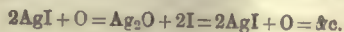
This being the case, the first question was whether any oxygen compound of silver and iodine is formed—such as silver oxide, iodate of silver, or silver oxyiodide? It was found, however, that the clouded film remained perfectly unchanged in ammonia, and no trace of chloride could be obtained by adding hydrochloric acid. Moreover, the opacity could be produced in the complete absence of oxygen in an atmosphere of hydrogen, which, as we have seen, favours it. In this case the opacity occurred distinctly more quickly than it did in air with the same exposure.

If no oxygen compound is formed, Scholl says, we can only conclude that pure silver iodide is present. That this is the case may be shown by heating an exposed plate which is strongly opaque in parts; both the clear and opaque parts turn of a clear deep yellow, which is characteristic of the change from the hexagonal system of crystallisation to the regular at temperatures over 146° C. (In repeating this experiment I find that the deep yellow colour produced by heating goes off again at once as the plate cools. This is exactly analogous to the deepening of colour of pure iodide in the light, and the return to the original colour I have already noticed.)

In fixing solutions of sodium thiosulphate or potassium cyanide, the film dissolves equally in the unexposed transparent and exposed opaque parts. (The action of sodium thiosulphate is to make the unexposed parts of the film opaque, just like the exposed parts. Potassium iodide has a somewhat similar effect, ammonium sulphocyanide also, but it seems to dissolve the exposed opaque parts less readily than the transparent parts.)

From these experiments Scholl says we may conclude that the opaque film is formed of pure, mechanically divided silver iodide, and that oxygen plays a catalytic part in advancing the formation of an intermediate substance. He considers the reactions caused by the exposure of the silver iodide to be somewhat as follows:—

According to Arrhenius, silver iodide exposed to light is dissociated and its stability strongly affected. For complete decomposition, a substance must be present which can combine either with silver or iodine. In the foregoing case, the silver forms, with the oxygen of the air, a compound, possibly  $\text{Ag}_2\text{O}$ , and the silver iodide will be more easily decomposed by the presence of oxygen. This silver oxide must be again decomposed by light, and the silver set free again forms silver iodide with the free iodine, whereupon the same process can begin all over again.



In this way there must be a continual transference of atoms, which, no doubt, is connected with the loosening and clouding of the whole film. It is unimportant whether  $\text{Ag}_2\text{O}$  itself or another body easily decomposed in light is formed; the essential point is that oxygen, by forming a compound, favours the complete decomposition of the already dissociated silver iodide, and then there is an immediate return to the original state, and a new formation of the silver iodide originally present.

Iodine must evidently, therefore, act more strongly than oxygen. On account of the greater affinity of silver for iodine than for oxygen, a compound which can be split up by oxygen must be decomposed much more readily by iodine. It is thus easy to understand why the opacity takes place so much more readily the greater the excess of iodine the plate exposed to air contains.

The fact that the images produced by the exposure of this pure iodide to light can be developed by mercury vapour or by silver deposited from an acid pyrogallol developer does not require, according to Scholl, to be attributed to a chemical change in the exposed film, but rather to the roughness of the surface caused by the breaking up of the film in the exposed parts, the rough surface more readily taking the mercury and silver. This agrees with my own observations, but I do not think it applies in all cases.

I have gone somewhat fully into these observations of Scholl's in order to make them clear. Whether his theory is correct I cannot say; but that oxygen, taken either from the surrounding air or from the watery vapour which is always more or less present in it, does play an active part in the decomposition of silver haloids in light, has been proved by H. B. Baker (*Trans. Chem. Soc.* 61, 1892, 728).

From experiments recorded in the *Researches on Light*, Hunt came to the conclusion that the first action of the solar ray is to liberate one-half of the combined halogen (chlorine in the cases recorded, but the conclusions apply equally to iodine and bromine), which is very readily, moisture being present, replaced by oxygen. This absorption of oxygen or its combination with the decomposing chloride he proved by placing some pure silver chloride in a bent tube closed at one end while the other was immersed in distilled water. After some days' exposure the water rose in the tube and contained chlorine, which was shown by the usual precipitate with silver nitrate.

That water is decomposed by the action of light on silver iodide is, I think, shown by the following simple experiment. Some of the brick-red powder of anhydrous super-iodised iodide was placed in a tube with distilled water, and then exposed in the sun. After a time it was found covered with little bubbles of gas, most probably oxygen. The iodide became paler in colour, though not lemon yellow, and the supernatant watery fluid gave a slight cloudiness to a solution of silver nitrate. By remaining longer in the water the pale yellow iodide was formed.

Similar little bubbles of gas were observed when precipitated silver was treated with iodine in distilled water and exposed to the sun.

Captain Abney has recorded a similar experiment in which silver iodide was placed in a test tube with a boiled solution of silver nitrate. On exposure to light, bubbles of gas were found collecting in the solid iodide, and proved to be oxygen. From which, he says, we may suppose that the liberated iodine decomposes the water in contact with it (as does chlorine) and produces hydriodic acid and oxygen.

Professor Meldola has also gone into this question in his *Chemistry of Photography*, and seems to think that an oxychloride may be formed by the decomposition of silver chloride by light in presence of watery vapour. This view is confirmed by Baker's recent work, already referred to. From the appearance of the substance produced by the union of silver and iodine under water, and its peculiar olive green colour, it is possible that it may be an oxyiodide or a subiodide, and it may be worth more careful examination than I have been able to give it.

In an earlier part of the lecture it was stated that iodine has a very much greater affinity for oxygen than the other halogens have, and so it seems not unlikely that oxygen may produce more marked effects upon iodised silver plates by the action of light than it does with the chloride or bromide.

I have noticed other effects in the opaque parts of these films which seem to be due to the formation of some gaseous product, but further observation is necessary, the tearing up of the film can, however, be readily seen on two plates I have here. Another plate exposed in contact with a gelatine film negative does not show it, but rather a great increase of density.

That there is an evolution of a gaseous product during the exposure to light in contact with air of these superiodised plates is demonstrated by the blister-like appearance visible in the exposed parts. Moreover, on exposing one of these films in contact with a silvered glass plate not only was the surface of the silver darkened in the parts exposed to light through the iodised film, but minute black spots were produced on the silver corresponding exactly with the blisters, as you will see. The composition of the dark spots remains to be seen, but they were most probably caused by iodine expanding and bursting through the film. This effect has not been noticed by Scholl.

If Scholl's theory of the catalytic action of oxygen be correct, and this action takes place when haloid salts of silver are exposed to light, even without the presence of organic matter, it will probably also take place, but in a much greater degree, when organic matter is present. When oxidation takes place in presence of water or watery vapour Schönbein has shown that peroxide of hydrogen is formed, and, more recently, Sonstadt has traced its presence, when chloride of silver is exposed to sunshine in water (*Proc. Chem. Soc.* 14, 1898, 179). This substance, as we know from Dr. W. J. Russell's recent researches, is capable, even in very small quantities, of producing the developable state of the haloid salts of silver on an ordinary gelatine dry plate. In this way, therefore, we may possibly be able to trace the connexion between the effects produced by peroxide of hydrogen vapour and by light upon the haloid salts of silver. Further investigation is, however, required.

I hoped to have been able to say something with regard to the action of light upon the ordinary Daguerreotype plate, and had intended to almost confine myself to the question of the probable nature of the latent and printed-out images upon iodised silver, but, as I went on and my attention was diverted to the points I have brought before you, I have not been able to complete the work I began. I propose, therefore, to close my lecture here and defer further consideration of the question till I can work it out at leisure and give the results to the Society in a supplementary paper.

The points I have dealt with are none of them new, but are, I think, of some interest generally, and I hope I may have been able to throw light upon them and carry on the work of my predecessors.

MAJOR-GENERAL J. WATERHOUSE, I.S.C.,

Hon. Secretary, Royal Photographic Society. ♀



## FOREIGN NEWS AND NOTES.

**Ferric Oxalate for the Platinum Process.**—Herr Gaedicke has worked out the following method of preparing this salt, and publishes it in the *Photographisches Wochenblatt*. To prepare half a litre of ferric oxalate solution of the strength required for the platinum process, take 30 grammes of iron wire, polish it with glass paper to free it from dust, place it in a porcelain dish with 150 c. c. of nitric acid, and heat it over a spirit lamp. At a certain temperature there will be violent ebullition, and red fumes will be emitted in considerable quantity. Avoid their effects by placing the vessel out of doors. If all the iron is not dissolved, add more acid. A thick, dark brown liquid is thus obtained, with a small precipitate of carbon, which is of no importance. Pour the brown fluid into another vessel containing 150 c. c. of strongest ammonia (sp. gr. 0.91); stir up the dark brown paste with a glass rod, and, if necessary, add more ammonia until it smells strongly of the same. Be careful to avoid waste, otherwise the final solution will be too weak. Dilute the paste with a little water and pour it into a 5-litre bottle. Make up the quantity to 4 litres with water, cork the bottle and well shake it. After it has stood for five minutes, gently lower the bottle on to its side with the neck projecting beyond the edge of the table, and let it rest five minutes longer. The brown precipitate will sink below the level of the neck, and the cork should then be slowly withdrawn to allow the water to escape. This process of washing by decantation should be repeated four times, and the bottle should be allowed to stand half an hour after the final washing to permit the removal of as much water as possible. After draining the precipitate, add 110 grammes of oxalic acid in crystals (fresh). This and subsequent operations should be done by artificial light. Stir or shake until completely dissolved, but avoid heating the preparation, as it would then decompose. The yellowish-green fluid should be filtered to remove the carbon, and kept in absolute darkness. If there is less than half a litre, make it up to that quantity with water, but the yield is usually about 600 c. c. In the latter case there will be only 17 instead of 20 grammes of ferric oxalate per 100 c. c.

**Voigtlander & Sohn, Brunswick.**—We learn that Dr. Hans Harting, formerly with Messrs. Zeiss, of Jena, has joined the board of management of Messrs. Voigtlander & Sohn. He succeeds Dr. Miethe, who was recently appointed Professor of Chemistry and Spectrum Analysis at the Technical High School, Berlin.

**Filter Papers.**—The *Deutsche Photographen Zeitung* mentions that, if filter papers are immersed in a bath of nitric acid (sp. gr. 1.42) for a short time, and then well washed with water, they remain porous, and will not tear when used for filtering warm solutions.

**Surgery and the Cinematograph.**—The eminent French surgeon, Professor Doyen, exhibited in July at Kiel, before a select audience of scientific men, a number of cinematographic representations of surgical operations. The descriptions given in text-books are necessarily incomplete, and it is difficult for students to follow all the details of an operation in the hospital theatre, but the cinematograph affords an opportunity of recording an operation in such a manner that it may be followed at leisure and repeatedly. The representation was regarded with great favour from an educational point of view.

**Flashlight Accident.**—We read in the *Deutsche Photographen Zeitung* that an unfortunate man named Stückrad lost his life recently at Maffersdorf in attempting to photograph by means of magnesium flashlight. The powder was placed in a tube, but, in taking breath to project it through the flame of a lamp, he drew the ignited charge into his mouth. His jaw was shattered and he was instantly killed.

**Poisons.**—Edward Crouzel, in the *Chemiker Zeitung*, recommends the following remedies for first help in case of poisoning, when the cause is unknown: Give half-gramme doses of tartar emetic in hot water at short intervals. Make the person drink cold milk to which five per cent. of borax has been added. The milk will tend to protect the walls of the stomach and the borax form insoluble compounds with mineral bases. To counteract collapse, give a mixture of concentrated cold coffee and Peruvian bark in equal quantities, with a little sugar and a few grammes of Hoffmann's drops. A solution of albumen may be used instead of milk. A doctor should be fetched immediately, and these remedies used meanwhile.

**A Spotting Medium.**—The *Photographische Chronik* mentions that an excellent medium may be prepared by scraping away the dense portions of old negatives. When a sufficient quantity has been secured, place it in a small bottle, add a little water, a few drops of acetic acid, and dissolve by means of heat. A thickish paste is thus obtained, which has the same properties as the negative, and which is easily used with the brush. The paste may also be prepared from the cuttings of toned prints.

**The Pictorial Post Card.**—The *Progrès Typo-Litho* draws attention to the enormous development of this industry. At Frankfurt a/M, 12,000 hands are employed, and it is estimated that 100 new designs are brought out every day in Germany. Reckoning that 1000 cards of each sort are printed, the annual production must exceed 30,000,000. Most of the cards printed in Germany are exported to Austria, Italy, England, France, Sweden, Russia, South America, and Australia.

**A Durable Ferrous-oxalate Developer.**—Dr. Hauberisser, of Munich, has been making a series of experiments as to the action of certain additions to the ferrous-oxalate developer, and finds that the following gives the most lasting developer:—

1. Neutral potassium oxalate .....	500 parts.
Hot distilled water .....	1500 "
2. Ferrous sulphate .....	200 parts.
Distilled water .....	600 "
Sulphuric acid .....	g. s.
3. Rochelle salts .....	20 parts.
Water .....	100 "
4. Potassium bromide .....	10 parts.
Water .....	100 "

For use, add 5 parts of No. 2 to 1½ parts of No. 3, and boil, and, whilst hot, add to 17½ parts of No. 1. For stand development, the above should be diluted with from 100 to 200 parts of water.

**Orthochromatism and the Characteristic Curve of a Plate.**—Dr. Eder points out, in the *Photographische Correspondenz*, that we understand by the term characteristic curve the dependence of the blackening on the exposure, that is to say, in what way the blackening increases as the exposure increases. With white, or blue, or violet light the course of this curve is usually regular, that is to say, with increasing exposure the blackening also increases to a very high limit. This, however, is not the case with many orthochromatic plates by red, yellow, or green light. It may here happen that small quantities of light may produce a deposit, and this may increase to a certain amount; then, however, it will remain almost constant, although exposure is increased. This is the reason why many plates when tested in the spectroscope may prove to be very sensitive, and yet give no good results in practical work. Spectroscopic tests are therefore insufficient, the whole course of the characteristic curve must be determined by coloured light.

**Balagny's Silver Intensifier.**—This is given in the *Bulletin de la Société Française*:—

1.	
Sodium sulphide .....	25 parts.
Water .....	100 "
2.	
Silver nitrate .....	5 parts.
Water .....	100 "

No. 1 is dropped slowly into No. 2. The precipitate first formed is redissolved on further addition of No. 1. The negative is placed in this till bleached, and well washed and redeveloped with any developer.

**Another Three-colour Process.**—According to Dr. Neuhauss, the very best results which he has seen in trichromatic printing have been obtained by Herr Hofman who uses the ordinary method of taking the three negatives, but has discovered how to make carbon tissue in the three requisite colours. Neuhauss states even very large sizes can be worked, and that there is no difficulty of registration, and that paper prints are as brilliant as transparencies.



**To Clean Nickel.**—The *Photographische Chronik* recommends a bath of 2 parts of sulphuric acid to 100 parts of alcohol. Immerse the articles in the bath for a few seconds, rinse with water and dry them. They may be polished in the usual manner.

**A New Reducer.**—Professor Namias suggests the following as a new reducer which will keep well, and obviously does not require the negative to be absolutely free from hypo:—

Potassium permanganate .....	1 part.
Sulphuric acid (strong) .....	2 parts.
Water .....	2000 "

The dish must be continually rocked whilst the reduction is taking place, and the solution cannot be used over again. If the gelatine is stained brown, it can be removed by bathing in a one per cent. solution of oxalic acid. The above solution, when made double the strength, may be used to produce *contretypé*. The negative should be fully exposed, and developed with a hydroquinone developer rich in bromide as long as possible without producing fog; the negative should then be rinsed well, and immersed in the permanganate solution, when the image will dissolve, leaving the silver bromide unaffected by light intact, and this, after exposure to light, may be developed in open daylight, and the following should be used:—

Metol .....	10 parts.
Sodium sulphite .....	40 "
Potassium hydrate .....	10 "
Water .....	1000 "

#### OZOTYPE AT THE CAMERA CLUB.

THE march of events is such a quick march, and so many photographic events are crowded into the short space of eight months, that many are apt to forget the particular items of photographic advance which happened so long ago as the month of March; but, if the inquirer will take the trouble to overhaul the journals of that date, he will find that in that month Mr. Thomas Manly read a paper at the Royal Photographic Society on a new printing process, which he called Ozotype. Mr. Manly has much improved this method of printing, and he last week demonstrated the nature of the process at the Camera Club.

Ozotype may be described as resembling the carbon process, while at the same time it is distinct from it. Carbon tissue of the ordinary kind is employed, but it is not sensitised, while at the same time its carbon is used to build up the image. As Mr. Manly was able to show the entire process, from the preparation of the paper to its final appearance as a picture, we cannot do better than to follow his manipulations in detail.

A sheet of Rives paper is pinned to a horizontal board, and a couple of drachms of sensitising solution—the operation taking place in full daylight—is poured into the centre, and worked all over its surface with a broad hog's-hair brush. The exact nature of this solution is at present a secret, and further than that it contained a bichromate and a manganous salt Mr. Manly did not describe its composition. It can be bottled off, and will keep indefinitely. The paper so prepared is hung up to dry, and, provided the paper be of a pure kind, it will keep when dry for several days. It is exposed under a negative in the usual way, and seems to be about as sensitive as platinum paper. It may be noted that the image which becomes visible in the printing frame is not unlike that afforded by platinum. When printed, the paper is washed until all soluble matters disappear, when it can be dried and kept for any reasonable period before being submitted to the next stage of the operations.

This consists in pigmenting the image by associating it with a sheet of carbon tissue of the same size as the print. Note that, unlike the carbon process, the tissue does not come upon the scene until exposure has been completed without its aid.

To accomplish this purpose, the print and the tissue are placed together in a tepid bath, consisting of water, 40 ounces, to which has been added 50 minims of glacial acetic acid, 30 grains of quinol, and a drachm of glycerine. After a couple of minutes' immersion, the two sheets are withdrawn together and squeezed face to face. They are now hung up and dried.

When dry, the print, with its tissue adherent, is placed to soften in cold water, and is then developed in a hot bath, just as if it were an ordinary carbon print. The colour oozes from it, and it is laved with the hot water as soon as the tissue leaves it. It is here that control over the print comes in, for excess of washing will dissolve away all the colour and leave nothing but blank paper. While this washing operation is going on, the print is laid upon a sheet of zinc which lies ready for it in the hot bath. Treatment with weak alum solution completes the operation, and the print can then be mounted on cardboard in the usual way. Mr. Manly showed the entire process from beginning to end, by means of prints which he had ready to take up at its various stages from point to point. He also showed a large number of finished and mounted pictures, which the members present could examine at their leisure. Some of

these prints were extremely good, but it would have been as well if the lecturer had had other prints, from the same negatives, by a standard process, so that his auditors could have compared the two. We say this, because, in some cases, it was not clear whether faults were traceable to the process or to the negatives from which the prints were made.

Mr. Manly concluded his demonstration by showing some very interesting experiments with unpigmented ozotype prints. In the first of these he took a print, and, placing it in a dish, poured upon it a solution of aniline hydrochloride, made strongly acid with sulphuric acid. The print under this treatment gradually acquired a fine green colour. By further treatment with ammonia this changed to a rich purple. Taking now the original aniline solution, and adding to it a proportion of a two per cent. cupric chloride solution, and applying it to a fresh print, the latter turned bright blue. It was suggested by a member present that possibly such a method of colouring might be applied to lantern slides, and the lecturer said that there was no reason why such an application should not be successful.

The Rev. F. C. Lambert, who occupied the chair, said that the Club ought to congratulate itself upon passing an evening in such a practical and pleasant manner. Such a paper, combining as it did both theory and practice, was a model one for a club of photographic workers. The usual vote of thanks closed the proceedings.

#### ON PRINTING IN CLOUDS.

How often is it, when a landscape has been selected and the lighting proves satisfactory, that the expanse of sky which demands inclusion is beautified by the presence of varied forms of clouds which are requisite to set off the picture? And, even when the photographer is fortunate in viewing above his selection a charming crown of light, fleecy clouds, with what frequency is he successful in securing them on the same plate as the landscape without sacrificing the latter by under-exposure for the sake of retaining the clouds? Thus generally in the simple finished print the sky is a blank, uninteresting, white expanse, which is so fatal as to prove quite sufficient to discount any beauty which may exist beneath its canopy, and destroy what might otherwise be a picture. On the other hand, with suitable clouds, often a very ordinary photograph can be so improved as to really merit the higher title of "picture," notwithstanding that it may still have its weak points.

Somehow or other, numberless amateurs, even those who would indignantly repudiate the designation "tyro," seem to have got it into their heads that to print in clouds is a feat quite beyond their powers of performance, and, despite every assurance to the contrary, they will persist in believing that it is on a par with the Labours of Hercules; and so still their prints are finished with their ghastly white skies, and not even an attempt is made to sun down the most glaring.

At least, why will not the P.O.P. printer try what he can make of printing in a cloud or two? "Nothing beats a trial" is a wise maxim, and one which the fatalist in photography would do well (*pictorially*) to take to heart. Certainly, printing clouds in platintypes, bromide, carbon, and other unseen, or comparatively unseen, printing processes is a more formidable undertaking, but even here a little care will accomplish much, as the writer hopes in due course to show.

But first to generalities. The landscape or pastoral photographer should be as keenly on the outlook for pictures overhead as for those more on a level with his eye. Readers of this paper have so often obtained full instructions in taking cloud negatives that it is only wasting valuable space to repeat them here. The writer, at the outset of a career photographic, endeavoured to print clouds in half-plate prints from half-plate cloud negatives, proceeding in the orthodox fashion, using the back of a printing frame to support the print and negative over it, and holding the whole in the sun (or apology for it) during the entire operation. In cold winter weather, with the sun in hiding, it was quite an heroic undertaking to stand at the open window and shiver, with fast freezing fingers, for a period of time varying from fifteen to thirty minutes until the clouds were "done." Nor, apart from this drawback, was the method satisfactory. Where the view was taken horizontally, whether the clouds fitted in well or no, there was no choice, the sky negative, being of the same size as the print, of necessity could only be placed squarely over the print so as to cover it entirely—this obviously; and yet often the clouds were not desirable in the place where they coincided with the print.

Though this disadvantage disappeared when a vertically taken landscape print was placed under a horizontally taken cloud negative, there was the awkwardness of shading the lower portion of the photograph, necessarily uncovered by the cloud negative, from the light. Again, in both cases, when the light was bad and printing prolonged in the frequent compulsory examinations of the print, either negative or print was very apt to slip and double printing result. A way out of all these troubles occurred to the writer, and that by utilising whole-plate cloud negatives for printing into half-plate prints. Printing was then done in a whole-plate printing frame, when all previous difficulties and annoyances at once disappeared. The advantages accruing from this plan were enormous, and should be obvious to every one. Hands were free, and there was considerable choice in the available expanse of negative of that



part most suited to the particular print. Of course, initially, some extra trouble is involved, but it is more than repaid in the subsequent ease of procedure, &c., it affords. From the original cloud negatives first of all are made transparencies. To the lantern-slide maker this will present no difficulties, but others may prefer to use the useful Novitas stripping P.O.P. (most simple to use), and transfer these prints to glass. From these, enlargements to double the diameter of the prints to be "clouded" are made; that is to say, quarter-plate prints will require a half-plate cloud negative, and half-plates a whole-plate negative. Each individual must decide for himself what he will make the medium of his enlargements—whether he will use films, plates, or Wellington negative paper. Films, though, of course, the most expensive, are undoubtedly the best for the purpose, since they can be printed from either side, and celluloid, being almost as transparent as glass (the cloud image in any case being thin), the landscape print, when fastened down in the frame, will show through the negative very clearly—quite a necessity for exact masking. While the Wellington negative paper has the great merit of being the cheapest and at the same time a very excellent material, which, like films, can be used either side up in the frame, yet necessarily it has not the same degree of transparency, which, for our purpose, is the great advantage of the former, and even when a very thin negative is made thereon, and, with a very bold print underneath, it is seldom that the outlines of the latter can be distinguished through the negative in the same way as through films; not, indeed, unless it be held up to the light, which, for the purpose of adjusting masks, is seldom practicable. Plates, in price coming between films and negative paper, can, of course, only be printed from one side, this constituting their drawback; but, of course, they print as expeditiously as films, which is not the case with negative paper, though the latter is astonishingly grainless.

For those who have never used this paper, and think of trying it for this purpose, it may be remarked that its manipulation presents no special trouble, being almost identical with the working of bromide paper. However, whatever material be used, metal is the developer recommended to secure a nice soft, thin, quick-printing enlargement, full of detail, and such a one any amateur who can enlarge should find no trouble in making. Of course, where enlarging is not done, these could be made professionally from the amateur's negatives if it were desired. If the sky does not fill the entire enlargement (which will seldom be the case, since, in enlarging, due care must be taken to preserve a certain proportion between the clouds and the size of landscape with which they will be used, or the combination will be absurd), the rest should be rendered quite opaque (either with some blocking-out medium or paper) to protect any part of a print which may rest upon this portion. It should hardly be necessary to remark that, if films or paper negatives be used, the printing frame will require a piece of clean glass in it on which to support the flimsy material. Before the actual printing is touched upon, it cannot be too firmly impressed upon the cloud-printer that it is essential, that some sense of fitness should be shown in the selection of clouds for each negative, that due and full regard should be given to the lighting and character of the landscapes into which they are to fit. The reader may laugh at this word of caution, but it is a necessary one, for the reader has seen a smiling summer landscape, obviously taken in sunlight and without a suspicion of a heavy sky, actually finished off (in more than one sense) with threatening storm clouds; and, again, buildings strongly lighted from one side crowned with clouds as strongly lit from an opposite direction! So, good readers, beware of such anachronisms.

Before starting upon the cloud-printing it may be necessary to cut a mask to protect the landscape or building if the sky line be very delicate or irregular, but very often such a special mask is unnecessary, and simply one or two pieces of cardboard (like those found in packets of printing paper) will serve the purpose; but, if a special mask is necessary, the best way to secure one is to paste down a waste print on a bit of card, and carefully cut away the sky. Next select a suitable cloud negative from your store, and place your print requiring a sky in position upon the most suitable portion of the chosen negative. Then, after fastening down the back, the mask can be laid over the part with which it coincides, the adjusting of which is quite a simple matter, as the picture should show through the cloud negative. The mask placed, the frame can be put out in the sun, but this necessitates keeping the shade moving all the while to obviate a palpable join; but, if the frame be left by itself out in the shade, beyond an occasional examination of the print and moving of the mask just an atom higher or lower, there is no need to stand over it—a great convenience. With platinotypes whose faint image is difficult to discern under the negative, and still more so with carbons and bromides, where there is no visible image, cloud-printing is not quite such plain sailing, as obviously the mask is not so readily adjusted. Therefore, using these papers, as a print with an only too wide join between landscape and sky, is a "waster," it behoves the printer to take especial care, since such faults do not come to light until the prints are developed. In printing clouds in carbon tissue, of course, some guide to the action of the light—some actinometer—is essential, and is also desirable in the case of platinotype. The best plan is to use on a spare part of the negative an unprinted trimming of P.O.P.

In both cases, when this is printed to the depth desired in the finished print, its companion can be safely assumed to be finished too. As a

guide to the accurate placing of the mask, the back of the print should be covered by a large-sized piece of white paper, which will show up the guides for the arranging of the mask, which guides are to be presently cut. Before the print be taken off the landscape negative, open each half of the back in turn, and, raising the print exactly where the sky line begins, cut out a nick in the edges. These, thanks to the white paper, will clearly be seen through the cloud negative, and will serve as guides to accurately adjust the mask. But let it be noted that, where many prints off one negative requiring clouds or an enlargement from such are to be made, it is far less tedious to make one satisfactory print of landscape and clouds on Novitas P.O.P. and transfer it to glass, whence a combined negative, saving all further trouble, is secured. It is hoped this paper will help some photographically "lame dogs over a stile;" if so, it has not been penned in vain.

SEMPER EADEM.

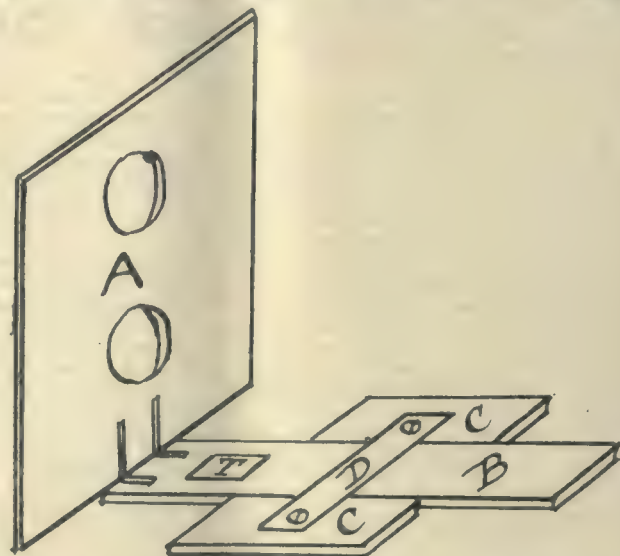
#### HOW TO MAKE A TWIN-LENS FOCUSING HAND CAMERA.

No doubt many readers on seeing this title will at once come to the conclusion that the making of such a camera is beyond their powers. I trust that any such will believe me that it is not at all a difficult matter, and that, if they only follow the instructions, they will find themselves in possession of a very serviceable hand camera.

As a twin-lens camera must necessarily be larger than a single-lens camera, it is necessary to use as light a substance as possible. I therefore selected millboard for the interior of the camera, and shall now proceed to state the *modus operandi*.

We will first make the camera box (fig. 1, A). To do this, take a piece of millboard 4 inches wide by 16 inches long. Rule lines across at  $4\frac{1}{2}$ ,  $3\frac{1}{2}$ , and  $4\frac{1}{2}$  inches respectively, and, with a sharp knife, cut nearly through, but not quite. Fold the millboard over in these cuts, and, by gluing the two ends together, we get the four sides of our camera box. Next take another piece of millboard the same size, cutting and folding as before. This latter is for the finder, and should be glued to the top of the camera box (fig. 1, B).

We next require two pieces of millboard, about  $5\frac{1}{2}$  inches by 9, for the front and back of the camera box and finder. I have given these measurements rather larger than is actually required, any surplus can be cut away later on. Glue these two pieces to the back and front, leaving about



a quarter of an inch at the bottom. This should be done very carefully, so that no light can creep into the camera box. I found some old mackintosh cut into strips answer the purpose very well. Now cut a hole in the back of camera box  $4\frac{1}{2}$  by  $3\frac{1}{2}$  inches (fig. 1, C), and, in the front, a hole about 2 inches square (fig. 1, D). Next cut a hole 2 inches square in front of finder (fig. 1, E), and on the top cut one about 4 by 3 inches (fig. 1, F).

Before proceeding further, it would be advisable to decide on the size of the dark slide we intend using, as we can then cut away any superfluous millboard. Place the dark slide chosen on the back of the camera box so that it is in exact register with the hole,  $4\frac{1}{2}$  inches by  $3\frac{1}{2}$  inches, that has been cut out. Mark this on the millboard, and then cut away any from the sides that is not required. Get some pieces of velvet or plush, and glue over the back of camera box where the dark slide comes, so as to keep any light from creeping in.

We will now proceed to make the focussing arrangement. Several methods may suggest themselves; but, as I am giving my own experience, I will state the arrangement that I adopted, and which has given every satisfaction. Moreover, it has the advantage of cheapness.



In fig. 2 I have made a rough sketch of the focussing arrangement. A is a board to which the lenses are attached. It is advisable to make it the full size of the inside of camera case, as by so doing it helps to keep the light from the camera box, and also hides any defects in the making of same. B is a piece of wood about 3 inches long by about  $1\frac{1}{2}$  inch wide, and about  $\frac{1}{2}$  inch thick. This is fastened to the focussing board with two small brass brackets; see that they are at right angles, or otherwise the two lenses, when in position, would not be exactly in register. C C are two pieces of wood the same thickness as B, but which need be only about 2 inches long. These are screwed to the bottom of our camera case, so that B will slide up and down easily between them. In order to keep the board upright, a small brass plate, D, should be screwed to C C.

As the two pieces of wood, C C, must be fastened in the correct place on the bottom of camera case, it would be as well to fasten them in position now. The case can be made of any kind of wood, the lighter the better. Unless the reader is very clever with his tools, I should advise him to use any light wood, and cover it with leather. However, whatever kind is decided upon, take a piece about  $6\frac{1}{2}$  inches wide by 9 inches or 10 inches long. Place the camera box on this, allowing about  $1\frac{1}{2}$  inch at the back, according to the thickness of the dark slide. Cut away sufficient of the millboard at the bottom of the front of camera box to allow the pieces of wood, C C and B, to go under. Mark the position of C C, and screw them on the bottom of case so as to allow the piece, B (to which is attached the focussing board), to slide smoothly backwards and forwards. Now

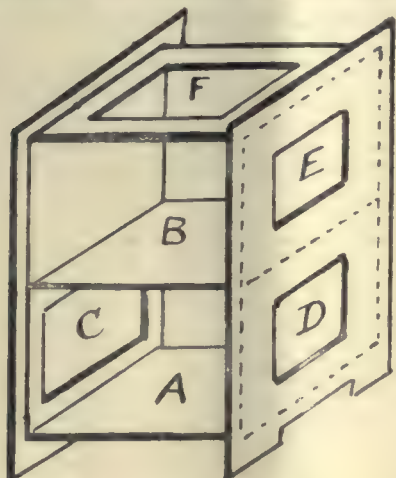


Fig. 2.

get what is termed a T screw and milled head, which can be purchased at any maker of camera fittings. Make a hole in B to admit the T screw, sinking the T piece in the wood (fig. 2, r), so that when in position it will slide easily with B under brass plate, D. Make a slit in the bottom of camera case between C C, about two inches long, to allow the T screw to come through; screw the milled head outside on to the screw. If this has been carefully done, the focussing board can be moved backwards and forwards, and a turn of the milled head will tighten and hold in position.

We will now connect the focussing board with the camera box. This connexion must be absolutely light-tight, and we must purchase or make a small piece of bellows. The stretch of this will depend on the focus of the lens we intend using. The distance from the back to front of camera box is 4 inches. This, with the velvet at the back and the small piece of bellows connexion, would make the distance about  $4\frac{1}{2}$  inches to  $4\frac{3}{4}$  inches. Presuming the focus of the lens to be 5 inches to  $5\frac{1}{2}$  inches, we shall only require a stretch of about 2 inches of bellows. Glue this to the focussing board and to the camera box. Should a wide-angle lens be chosen, the millboard of which the camera box is made should be cut in the first instance 3 inches instead of 4 inches. For general work, however, a lens of 5-inch to 6-inch focus will be found more useful.

The finder can be connected to the lens board in the same manner by a small piece of bellows, but, if the board is made the full size of the interior of the camera case, this is not necessary, as any little light creeping in may be discarded, as it makes no appreciable difference in the brilliancy of the picture on the finder. Should, however, a smaller lens board be chosen, it would be imperative to use a small piece of bellows.

We will now finish the finder. Get a piece of looking-glass about  $4\frac{1}{2}$  inches wide by 5 inches long; place this in the box opposite the lens at an angle of  $45^\circ$ . Now get a quarter-plate focussing screen, and place over the hole cut out on top of finder. Before fastening these permanently in position, see that the image on the finder coincides with that in the camera. Fasten the lenses in position on the lens board. Now

place a piece of ground glass in the dark slide, drawing both shutters; place this in position at the back of camera box, and focus on some object. Now look at the finder. If everything has been carefully done, the image should be perfectly sharp and coincide with that in the camera. If it is not so, alter the position of the ground glass or looking-glass until they agree. Having done this, glue the glasses in position, and the interior of the camera is complete.

We will now put on the sides of the case, the bottom being already done with the camera in position. Place the sides close up to camera box, having previously cut out a piece from one side to allow the dark slide to be inserted and withdrawn. Fix these sides in place by glue or screws, place the dark slide at the back of camera box, and cut a piece of wood to fit exactly for the back of the case.

As it is necessary for the dark slide to fit close up to the camera box, fasten two springs on the back of the case so that, when it is placed in position, the springs will press against the edges (not the shutter) of the dark slide. Before putting the top of the case on, mark the place where the ground glass of the finder comes, cut this piece out very neatly, as it will serve for the lid of the finder. Now place the shutter on the lens and rack it out to the fullest extent required. Place the door in position and fasten with hinges, having previously cut out the holes opposite the lenses. Saw or plane away any superfluous wood, and the camera is complete with the exception of being covered with leather. I have not gone into every minute detail in this article, as I have concluded that any one deciding to make such a camera would not require every little detail and measurement given, but I trust I have made it clear enough to enable any one to turn out a very serviceable camera; I have had mine in use now for some years and am quite satisfied with the results.

J. H. BURKE.

#### ROOM FOR IMPROVEMENT.

DURING the last five-and-twenty years photography has admittedly progressed wonderfully. We can hardly desire much advance in the quality of our plates and paper, except perhaps in their keeping properties; our knowledge, too, of their manipulation is almost scientifically exact; but our studios, at least, still bear a remarkable resemblance to those of that blissful period when the public cheerfully mounted six flights of stairs to obtain *cartes-de-visite* at two guineas per dozen, and were not so hard to please as they are now.

The photographer, even in these days of enlightenment, still buries his head beneath that awesome black cloth, the terror of children, or, possibly, a potent source of smiles and unseasonable mirth. Then, what unnecessary waste of time is involved in the removal of the focussing screen, the insertion of the slide, and the withdrawal of the shutter. When is some inventive genius going to give us a studio camera with some sort of full-sized finder, giving the picture right side up, and enabling us to have the plate in position, with slide drawn, ready for immediate exposure directly the aspect of things satisfies our critical taste? Then no more will any sorely worried camerist get his shutter withdrawn only to find that the sitter has moved entirely out of position since he focussed him, her, or it—a thing which really does happen sometimes, to the great enrichment of the English language. Only think how we might seize baby's prettiest looks at the very moment, or record for ever the special characteristic of my lady's pet if we only had that camera! Of course, we already have twin-lens arrangements, but only of a small size. If their principle could be embodied on a suitable scale without making the affair materially larger, possibly obtaining the additional image by means of some reflecting arrangement, thus needing but one lens, we should at once be in possession of the suggested improvement.

Again, our cameras might be made much lighter. When is the day coming that we shall have, say, a  $15 \times 12$  outfit, perfectly firm and rigid, suitable either for field or indoor use, and not necessitating a porter to carry it for us? What Elysian times those will be! Larger pictures will then be seen at the exhibitions, and the frame-makers will be in clover. No doubt, glass plates will at that period be superseded by a perfect film, at a lesser cost, and dark slides, in all likelihood, by a featherweight changing box, available for perhaps a hundred exposures.

Then that focussing screw. How long are we going to fumble blindly for it in half a dozen impossible directions, or turn a curious barrel-organ sort of handle at the back, which often obstinately refuses to budge—of course, when you most want it to? Surely our mechanical skill should be equal to the task of devising something more rapidly adjusted and accessible.

Our lenses, too, so exquisite in definition, such perfect products of the highest optical research; but, oh how heavy, and how bound down we are, within limits, to one definite focus, unless we attempt the risky experiment of changing the combinations! What a blessing it would be if we could have a lens available for almost any purpose, with varying focus, easily and accurately adjusted by means of a scale attached to it; one that we could use for interiors, groups, architecture at close quarters, copying, enlarging, or ordinary portraits, so that we need not get rid of all our cash in the purchase of half a dozen different lenses. It seems impracticable now, but so did wireless telegraphy twenty years ago.

When heavy cameras and fittings vanish, they will take with them their present clumsiness and ugly stands, with those creaking and tiresome levers



and screws; something more graceful and ornamental—movable by a touch of the finger from place to place—will have entered the region of actualities. There is not much to be said on the subject of backgrounds, furniture, and accessories that has not already been well thrashed out. The day of cruelly stiff and wooden posing chairs, rustic seats, balconies, &c., is practically past, and, if a man now uses an inartistic or inappropriate setting to his picture, he has no one but himself to blame—indeed, the time of total emancipation from these things approaches. But does not the very form of the studio itself admit of considerable modification? If the "painters' light" has proved itself generally inadvisable, and it is found undesirable to make our *ateliers* as much like ordinary rooms as possible, as some are now loudly preaching, why need they always resemble a sort of glorified greenhouse, without the beauty of its flowers, and ten to one far from waterproof? When shall we be rid of our complicated array of blinds and curtains, whereby we fondly imagine we regulate the light to a nicety, and on the management of which no two photographers ever seem to agree?

And when the day wanes, or the dark foggy season arrives, are we yet in possession of the perfect artificial light, equal in effect to the solar rays? Some will aver that their favourite illuminant, be it the arc light, electric incandescent, acetylene, or some modified form of coal gas, is quite equal to daylight. The fact, nevertheless, remains—whatever a few specially skilled workers can accomplish, the generality of portraits taken by artificial light are by no means up to ordinary standard; there is a certain glare, a nameless imperfection, about them that the sitters themselves are the first to recognise. No doubt, the science of the future will bestow on us that ardently wished-for desideratum, an easily managed and steady illuminant, really bearing comparison with the light of day, and so inexpensive that we may use it to do our printing by when the sun is conspicuous by his absence.

Turning from the studio to the dark room, Mr. Howard Farmer seems about to give us cause to change the name of that indispensable, if generally uncomfortable, place; and there is now really no excuse for our slopping about—working emphatically by faith rather than by sight—in a gloom that rivals the shades, and bemoaning the pertinacity with which that glass graduate keeps getting broken. By the way, why cannot our measures be made of some unbreakable material, as celluloid, *papier-mâché*, or vulcanite; surely this is not difficult?

There have been, as is well known, several distinct improvements in our developing dishes, and other little matters tending to our greater comfort when engaged in compelling the latent image to make itself visible. Chemical research has also kindly placed at our disposal a large array of new developers, each supposed to be better than the last, but all bearing a strong family likeness, and unreasonably lengthy names. We are still, however, crying in the wilderness for that ideal developer which shall do anything we want it to—adjusting itself, without modification, to the given exposure so amiably that we may obtain a good negative under almost any circumstances, thus making over and under-exposure absolute terms of the past. Let us not call it impossible; no man can tell what another decade may bring forth—perhaps even that elusive mystery of the composition of the latent image may be unearthed and proclaimed from the housetops. Perhaps—but let us speak with bated breath—some practicable system of colour photography may by then have made the fortune of its lucky discoverer, after convincing and rejoicing a too incredulous world!

These remarks are far from being made in any carping or ungrateful spirit. We have indeed to be thankful for much that our predecessors dreamed not of. Credit unlimited should be, and is, ungrudgingly given to the persevering men of theory, who have lived laborious days, adding richly to our knowledge of the chemical, physical, optical, and mechanical aspects of our art-science; and to the no less assiduous men of practice, who have given us the excellent and beautifully finished apparatus which we get along so well with that there is some danger of our fancying that the climax has been reached, forgetting that the higher we aim the more we attain to. It, of course, goes without saying that, given the most perfect tools humanity could wish for, the master hand of the skilled artist is necessary to the production of satisfactory work; but, if it is true that the expert, with meagre outfit, can surpass the incompetent or inexperienced, be they never so well equipped, it is still more an obvious fact that the former, unhampered by any petty mechanical hindrances, has a double chance to give his art full and untrammelled play.

A. LOCKETT.

#### CAMERAS FOR COLOUR PHOTOGRAPHY.

MR. T. R. DALLMEYER'S mirror camera, for use in colour photography, is so described in the inventor's patent specification:

I employ a movable mirror for successively diverting the beam of light from the lens to a number of sensitive plates.

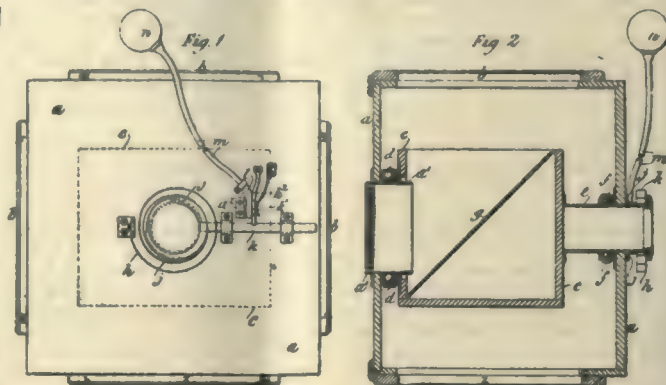
I employ a mirror fixed at an angle of  $45^\circ$  to a shaft co-axial with the lens, so that by turning the shaft the image is successively directed on to plates at the sides of the camera.

Fig. 1 is a back elevation, and fig. 2 a longitudinal section of the apparatus.

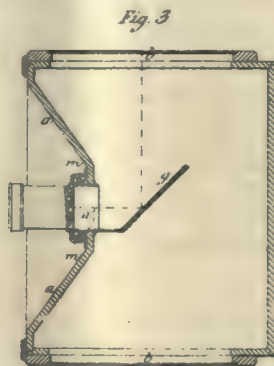
Fig. 3 is a longitudinal section of a modification.

In figs. 1 and 2, *a* are the walls of the cameras, *a'* is a tube fixed to the

camera and which carries the lens. *b b* are four plate-holders sliding in grooves in the ordinary manner, but placed at the four sides of the camera instead of at the back as is usual. *c* is a frame, the front of which revolves on the ring of balls, *d*, surrounding the tube, *a'*, and the back carries the shaft, *e*, which revolves in the ball bearing, *f*. *g* is a mirror fixed to the frame, *c*. *h* is a spring having one end fixed to the shaft, *e*,



and the other to the camera. *j* is a four-toothed ratchet or cam wheel fixed to the shaft, *e*, and *k* is a bolt engaging with it. *l* is a flexible ball placed between a lug, *a''*, on the camera and a lug, *k'*, on a lever, *k''*, operating the bolt, *k*. The ball, *l*, is connected by the tube, *m*, to a second flexible ball, *n*. By squeezing the latter the ball, *l*, is expanded, the bolt, *k*, is withdrawn and the frame, *c*, and mirror, *g*, are revolved through a quadrant by the spring, *h*, and are then again arrested by the bolt, *k*, engaging with the next tooth of the ratchet wheel, *j*. This forms a very



convenient arrangement for manipulating the mirror, but any other suitable device may be employed.

In fig. 3 the frame, *c*, is dispensed with, the mirror, *g*, being fixed to the tube, *a'*, which in this case is free to revolve in the ball bearing, *m*, and constitutes a hollow shaft carrying the mirror.

By this arrangement a smaller mirror is required. In this figure the means for rotating the mirror are not shown, they may be the same as in figs. 1 and 2.

#### THE USE OF SCREENS IN NEGATIVE AND POSITIVE WORK.

MR. R. R. BEARD has patented a process of this kind, which he thus describes in his specification:—

"I make a photographic negative or positive by employing before the sensitive photographic plate or film a ruled gridiron or other screen, which has (say) spaces one half the width of the bars or rulings of the screen, so that, if an exposure is made, I obtain a negative made up of lines with spaces double the width of the exposed portion—sixty or eighty bars to the inch is a suitable number. Now, if I move the screen so that the bars or rulings overlap the exposed portion and expose again, and so on with the third portion, in this way I obtain three negatives of different objects on one plate, or as many more or less, according to the width of bars or rulings as the screen affords.

"The screen can be a photograph, or anything so long as it serves the purpose to screen the sensitive plate or film.

"A positive produced from such a negative can be used in conjunction with a screen similar with that which the negative was taken for various purposes, such as, for instance, a magic-lantern slide. In this case I employ a frame in which is fitted two movable frames, one for the screen and one for positive or negative (if desired). I move one of these by a screw, and thus display the three pictures in succession.



"Or in window decoration or advertising, if the transparency, when mounted with the screen, be viewed at different angles, either of the photographs can be seen."

#### AFFILIATION OF PHOTOGRAPHIC SOCIETIES.

At a meeting of the Executive Committee, held at No. 66, Russell-square, on Tuesday, November 21, 1899, Mr. G. Scamell (Hon. Treasurer) in the chair, it was decided to at once issue a letter to the various affiliated societies, asking for official information as to the dark room and other conveniences at the disposal of members of affiliated societies, delegates, &c., for inclusion in a small pocket volume intended to give particulars of everything appertaining to the affiliation. It is hoped that this volume may be an annual one, and that the first will be issued early in the new year, sufficient copies to provide one for every member of the affiliated societies being printed.

It was also decided to ascertain what societies would wish to avail themselves of an organized interchange of lecturers, and to ask for their opinion as to the possibility of extending the "grouping" scheme in different centres.

A suggestion was considered for the circulation of the affiliation lectures longer in advance than is now practicable, and for the supply of abstracts of the lectures, with formulae, &c., to be retained by the societies borrowing same. Steps will be taken to supply the lectures booked to societies ten days in advance, to allow the reader thereof time to become acquainted with the subject-matter before the meeting takes place.

To meet the expressed desire of several societies for the services of a travelling lecturer, the Committee directed that some preliminary steps be taken to ascertain the feasibility of such an arrangement, and upon this a formal pronouncement will be made as soon as possible.

Negotiations are in progress for a lecture upon "Photography in Natural Colours," which will treat of every process now being worked, and will be illustrated as far as possible.

It was announced that a lecture upon "Rejlander: his Life and Work," by Mr. A. H. Wall, illustrated by slides of many of his best pictures, will be ready for circulation before very long.

The Committee entertain the hope that they will be able to secure the services of an eminent authority for the preparation of a critical lecture upon modern photographic picture-making, as exemplified in the work of the exhibitions during the past few years. Every effort will be made to circulate with it prints or slides of the pictures referred to.

## Our Editorial Table.

#### NATURALISTIC PHOTOGRAPHY.

By P. H. EMERSON, B.A., M.B. (Cantab.), F.R.P.S.

Third Edition, revised, enlarged, and rewritten in parts. Price 5s.

London: Dawbarn & Ward, 6, Farringdon-avenue, E.C.

WHEN a fourth edition of Dr. Emerson's book is published we hope that the printing will be done in England, so that the author may have the opportunity of supervising the work as it passes through the press. In the present case the book suffers from the fact that it appears as a specimen of American typography, which has not had the advantage of the author's revision, and thus, here and there, we come across some examples of transatlantic spelling, and one or two minor errata, which disfigure the pages of the volume. One can sympathise with Dr. Emerson in the annoyance of having his book maltreated in this fashion; and we are sure that no reviewer of gentlemanly feeling, in the circumstances of this case, would treat such unimportant slips as pegs upon which to hang an adverse criticism.

It is eight or nine years since the last edition of *Naturalistic Photography* was published, and, no doubt, there are to-day large numbers of photographers who will make the acquaintance of the book for the first time in its third edition. Of the new readers who will turn over its pages it may safely be conjectured that a very large percentage will be ignorant of what Dr. Emerson has done for photography. Neither the man nor his work is sufficiently known to the general photographic public, and for this state of things the person most responsible is Dr. Emerson himself. In an age when any charlatan can catch the ears of the mob by persistent shouting, Dr. Emerson is content to lead the life of a silent country gentleman in Norfolk, and eschew vulgar self-advertisement. He does not go lecturing on pictorial photography on the smallest provocation, or reproduce his own pictures in a newspaper, or publish never-ending lengths of penny-a-lining diffidence upon that topic, with the most unblushing and wearisome reiteration year after year. In other words, Dr. Emerson disdains to force himself down the throats of the photographic public, and, if he thus misses notoriety, at least exchanges it for respect.

But Emerson's place in the history of the development of pictorial

photography in Great Britain—and, for that matter, the world—is assured. When the photo-faker and all his works have been swept into the dustbin of time, three personalities will stand forth with the greater clearness to the gaze of the student of the future. We mean those of D. O. Hill, Mrs. Julia Margaret Cameron, and P. H. Emerson. The first two in portraiture, and the last in landscape and figure work, have, in the phrase of the time, "got more out of" photography than anybody else in the interpretation of human character and the sentiment of nature. In these days of illustrated photographic periodicals, nobody interested can fail to acquaint himself with the Hill and Cameron broadly treated portraits to the extent which the half-tone process, despite its imperfections, allows, but it is a thousand pities that Dr. Emerson's work is so inaccessible. In some of his books, notably *Life and Landscape on the Norfolk Broads*, *Pictures from Life in Field and Fen*, *Idyls of the Norfolk Broads*, and, above all, the magnificent *Pictures of East Anglian Life*, as well as in several separate plates, amongst which the dainty *Gathering Water Lilies* was more imitated than almost any other photograph we know—in these books, produced with a painstaking carefulness and labour which stamp the author as a thorough genius, there are a great number of photogravure reproductions from his negatives (direct, untouched, unfaked negatives, let it be marked), which, in our deliberate opinion, form a collection of the most wonderful and faithful nature photographs that have ever been produced. Of their kind nothing to-day excels or even equals them, and we repeat that it is a thousand pities they are not accessible to all modern photographers. But there must be many who can recall individual pictures, and as we write we pause and think, What arresting charm and conviction there was in the always delightful *Poacher*!

*Naturalistic Photography* should be considered as merely a part of the fine and conscientious work which Dr. Emerson, still fortunately a young man, and with his best working years in front of him, has contributed to art and literature. It cannot be adequately appreciated without a knowledge of the man. To his unflinching thoroughness there is no limit. He is sincere in all that he undertakes. In a *Son of the Fens*, for example, he gives a minute study of a Norfolk peasant from youth to man's estate, derived from actual and close observation. His pictures of East Anglian life were, so to speak, sketched and finished on the spot, for the author lived and worked amongst the very people he was closely observing. So, again, in *On English Lagoons*, the record of a year's wherry cruise on the Broads, not a line found its way into that fascinating record of a natural history tour which was not the outcome of keen observation and accurate knowledge.

It is precisely these faculties which Dr. Emerson brought to bear in the study of pictorial photography, which he took up some fourteen or fifteen years ago, when he produced some of his best work. *Naturalistic Photography* was the literary result of that study, and the book was preceded by object-lessons in the shape of the photographs to which we have referred. Thus Dr. Emerson has always sought to teach by his examples as well as his precepts, and the ideal edition of his book, which we hope one day to see published, should be illustrated by reproductions of his own photographs.

"A naturalistic photograph must be

"(1) True in natural sentiment;

"(2) True in appearance to the point of illusion;

"(3) Decorative."

In these sentences we have the key to Dr. Emerson's teachings in the volume before us. It is divided into three books, and there are some appendices. "Impressionism in Pictorial and Glyptic Art," "Phenomena of Sight, and Art Principles Deduced therefrom," "Naturalistic Photography and Art," "Technique and Practice," "Pictorial Art," "Photography not Art," are some of the subjects exhaustively dealt with. Those portions of the book which trace the characteristics of each nation's art, as well as some of the chapters devoted to the camera, the dark room, and so forth, are possibly not vital or even essential to a comprehension of what Dr. Emerson has to say on pictorial photography and its study. The author's characteristic vigour of expression may occasionally surprise, but it can never offend, for his manly advocacy of the pictorial photograph, which is the outcome of sincerity, observation, and truth, cannot but win him the regard of all interested in the progress of "pure photography" as opposed to mere photo-faking.

Of *Naturalistic Photography* we have before expressed the opinion that it is one of the most notable books that have ever been produced in connexion with the subject, and the new edition before us finds us of the same opinion still; but thorough justice will never be done to the author until a fourth edition is published which substitutes for some of the not very necessary chapters on technique a number of reproductions from his photographs, so that Emerson's theory and practice may stand side by side for all to profit by.

In conclusion, it will be well to remind our readers that the author withdrew his second edition, because he was convinced by his own researches and those of his painter friend, that no photographs give reproductions of nature as the eyes see it, and because of the impossibility of strengthening or making selected tones by development as proved by the researches of Dr. Hurter and Mr. Driffield. That is the true reason of the withdrawal of the second edition in a nutshell, and the third edition views photography from this standpoint.



# TELE-PHOTOGRAPHY: AN ELEMENTARY TREATISE ON THE CONSTRUCTION AND APPLICATION OF THE TELE-PHOTOGRAPHIC LENS.

By THOMAS R. DALLMEYER, F.R.A.S. With 26 plates and 66 diagrams. 145 pp. and a Bibliography.

London: William Heinemann.

THESE are parts of Mr. Dallmeyer's new book which make an especial appeal to all portrait photographers. In the seventh chapter, when dealing with the practical applications of the tele-photographic lens, he dwells upon its uses in the avoidance of distortion in portraits, or, as he succinctly puts it, "aiming at too large an image with a lens which is too short in focal length to allow an adequate distance to intervene between sitter and lens for good perspective drawing." We have several plates in the book, made respectively from negatives obtained with portrait and rectilinear lenses and lenses with tele-photographic attachments, illustrating the difference between good and bad perspective, which we commend to the study of portrait photographers, especially those with short studios. For drawing attention to the advantages of tele-photography in obtaining portraiture in true perspective, Mr. Dallmeyer deserves general thanks, and, when those advantages are more widely known, we shall expect to see them availed of by many. The book is addressed to those who practise photography either for pictorial or scientific ends, and it aims, and we think successfully so, at arresting the understanding of those having only a slight acquaintance with the science of optics. To this end the author devotes his second chapter to a discussion of the formation of images by the pinhole camera and, most importantly, its perspective drawing; and this is done so lucidly and simply that the reader is easily prepared to follow Mr. Dallmeyer into those branches of his theme which deal with tele-photography in theory. Chapters III. and IV. are concerned with the subjects of the formation of images by positive and negative lenses, and Chapter V. with the formation of enlarged images—the very pith of the book. The use and effects of the diaphragm, practical applications, and working data next take the reader from theory to practice.

The illustrations are as fascinating as they are instructive. We see again the famous photograph of Mont Blanc, taken at a distance of forty-four miles; enlarged pictures of the human eye, obtained by tele-photography; eclipse photographs; distant Alpine views, by Dr. Spitta; reproductions of balloon tele-photographs, by Captain Mario Moris, of the Italian Government; bird work, by Mr. Lodge; architecture, by Mr. Cruickshank; and some of the author's long-distance marine view work—all illustrating the wonderful power of tele-photography in delineating on the sensitive plate images which, when made with the ordinary lens, are comparatively insignificant, if not unrecognisable. Even in its illustrations alone Mr. Dallmeyer's book makes a powerful appeal to the imagination, and shows more vividly than words can express the inestimable value of the tele-photo attachment in long-distance photography.

Notwithstanding that the book is an elementary one, it by no means leaves its subject unexhausted, and there is no doubt that it at once takes pride of place as the most important books on tele-photography yet published. In a characteristically graceful preface Mr. Dallmeyer reviews the efforts of other labourers in this sphere of work, and pays the compliment of recognition to Barlow, Porro, Traill Taylor, Miethe, Steinheil, Schroeder, and others who had preceded him with their publications and constructions. But the fact remains that it is Mr. Dallmeyer himself who deserves the chief credit for having given tele-photography, in theory and practice, the prominence it now enjoys, by the paper on the subject which he read at the Camera Club eight years ago.

The book is handsomely produced and illustrated, and should prove in the highest degree instructive to many classes of photographers, from military strategists down to humble portrait photographers, who may be desirous of availing themselves of the unique facility which tele-photography affords of obtaining greatly enlarged images with a short extension of camera. But it will come with surprise to most readers to be told that, besides Mr. Dallmeyer himself, only three other English writers have dealt with the practical applications of tele-photography—Mr. Lodge, Mr. Marriage, and Dr. Spitta.

Messrs. BURROUGHS, WELCH, & Co., of Snow Hill-buildings, E.C., send us a copy of *Welcome's Photographic Diary and Exposure Record, 1900*. It is a compact pocket-book such as the amateur photographer can always carry with him. The greater part is devoted to ruled pages for recording exposures, and to exposure tables, diary, and memoranda pages. The printed matter is mainly such as will be serviceable to every photographer whether a user of "tabloid" chemicals or not. The book may be obtained of any photographic chemist, dealer, or bookseller.

Owing to great pressure on our space we are obliged to hold over several notices, including one of a new plate by Messrs. Cadest and Neall—the "Royal."

## News and Notes.

AMONGST the list of contributions to the Mansion House Refugee Fund we notice that of Kodak (Limited), 105*l*.

PHOTOGRAPHIC CLUB.—Wednesday evening, December 6, 1899, at eight o'clock. Demonstration of "Gravura," by Paget Prize Company.

OBSERVATIONS OF THE BIELAIDES.—Successful observations of the Bielaides were made by the astronomers of the Vienna Observatory last week from Sonnwendstein Peak, in the Austrian Alps. Sixty-seven shooting stars, mostly from the constellation of Andromeda, were seen from the beginning of evening up to moonrise. Also a magnificent fireball was observed shining in the constellation. Twelve photographs were taken.

We are informed that a photographic Society has been started in South Norwood known as the South Norwood Amateur Photographic Society. The meetings of the Society are held at the South Norwood Polytechnic on the second and fourth Thursdays in the month. Up to the present, forty members have joined. The subscription is 5*s*. per annum. The President is Mr. W. F. Stanley, of "Cumberlow," South Norwood. Communications should be addressed to the Hon. Secretary, Mr. E. Pierce, 26, Balfour-road, South Norwood, S.E.

THE TWENTIETH-CENTURY INTERNATIONAL PHOTOGRAPHIC EXHIBITION.—The display of photographs, which formed no strong a feature of last year's Exhibition at Bingley Hall, Birmingham, is to be repeated in March next in connexion with the Engineering and General Trades Exhibition, under the management again of Mr. Walter D. Welford. We understand that there will be competitions for the photographers' assistant, and one or two other novelties. The prospectus is in preparation, and, when ready, may be obtained from 19, Southampton-buildings, Chancery-lane, London, W.C.

CONSIDERABLE interest was manifested in the Borough Polytechnic Society's first monthly lantern-slide competition on the 22nd instant, members turning up in strong force. A good entry was obtained, and competition was keen throughout. Slides were judged in sets of three, and the least successful in each round were gradually weeded out, until only three slides remained. The best one of these three proved to be by Mr. E. J. Hoar, and was entitled *South Aisle, Ely*, for which he obtained the maximum number of ten points. He was closely followed by Mr. W. H. Andrews with *At Eventide* (nine points), and Mr. L. E. Cotterell was placed third with *Daffodils* (eight points). All slides were then criticised by the judges (Messrs. Bannister and Rawkins) as they were again projected on the screen, and points awarded.

THE Southsea Amateur Photographic Society's Twelfth Annual Photographic Exhibition will be held at the Society's rooms, 5, Pembroke-road, Portsmouth, on Monday, Tuesday, and Wednesday, January 29, 30, and 31, 1900. The following are the open classes: G, Landscape, Seascapes, and River scenery; H, Figure Studies, including groups, portraits, animal studies, and still life; I, Hand-camera Work, set of six prints, the camera to have been held in the hand during exposure; J, Lantern Slides, set of six; K, Beginners' Class, for those who have commenced photography since January 1, 1898; L, Not for Competition, exhibits invited. All exhibits must be delivered not later than Wednesday, January 24, 1900, to the Hon. Secretary, Mr. F. J. Mortimer, Southsea Amateur Photographic Society, 5, Pembroke-road, Portsmouth.

COLOURING BROMIDE PRINTS.—For oil colours, a hot solution of three per cent. of good white gelatine is spread upon the surface of the print by means of a wide and fine sable brush. After drying, according to M. Henry, the layer thus formed will take oil colours readily, and one may proceed to colour the print as desired. For water colours, the best results are obtained by the use of a solution of 120 grammes of shellac in 240 c.c. of alcohol. When completely dissolved, the solution is allowed to stand for twenty-four hours, and is diluted by taking 120 c.c. of the former and 120 c.c. of alcohol. This is to be filtered before using. The solution is applied to the surface of the bromide print by means of an atomiser until it appears to be slightly wet. When the print is well dried, which takes from ten to fifteen minutes, water colours may be applied as desired. If in certain parts the print does not take the colour sufficiently, the process of applying the solution is repeated in these places. The fixative varnish used for charcoal drawings, &c., may be used instead of the solution of shellac. The use of pastel is especially in favour for retouching or colouring bromide prints, but it is necessary that the paper should have sufficient grain, in order that the pastel may be readily applied. M. Henry has found that this grain may be obtained by the use of powdered pumice-stone in the following manner: A tuft of cotton is thoroughly impregnated with the powder, and, after having applied to the surface of the print a layer of the shellac solution above mentioned, the powder is applied by tapping lightly with the wad of cotton. The print should thus be covered with the powder before the solution is dry; in this way the powder attaches itself, and is fixed during the drying of the solution, leaving below a clear image. If necessary, the operation may be repeated until the desired grain is produced.

## Patent News.

THE following applications for Patents were made between November 13 and 18, 1899:—

RECORDING OSCILLATING LIGHT RAYS.—No. 22,613. "Improved Apparatus for Photographically Recording Oscillating Rays of Light." Complete specification. A. POLLAK, J. VIRAG, G. EGGER, and F. SILBERSTEIN.

DEVELOPING APPARATUS.—No. 22,614. "An Improved Automatic Developing Apparatus for Photographic Exposures." Complete specification. A. POLLAK, J. VIRAG, G. EGGER, and F. SILBERSTEIN.



CAMERAS.—No. 22,676. "Improvements in Photographic Cameras." Complete specification. D. H. HOUSTON.

ARTIFICIAL LIGHT.—No. 22,747. "Improvements in Apparatus for Producing Light for Photographic Purposes." W. H. SMITH and W. WILLIS.

KINEMATOGRAPHS.—No. 22,954. "Improvements in Kinematographs." L. E. GRANTICHTAEDTEN.

CAMERAS.—No. 23,039. "Improvements in or relating to Photographic Apparatus applicable to a Camera." Complete specification. A. LÉON and W. H. ENGLAND.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
4.....	Bradford Phot. Society .....	{ East Anglia and Adjacent Counties. Godfrey Bingley.
4.....	Camera Club .....	{ Travels in Ashanti and Neighbouring Countries. Dr. R. Austin Freeman.
4.....	Cripplegate Photo. Society .....	Gracina. A. C. Baldwin.
4.....	Darwen .....	Prize Slides.
4.....	Glasgow and West of Scotland .....	Demonstration: <i>Velox</i> Paper. Mr. Belton.
4.....	Kingston-on-Thames .....	{ Exhibition of Slides lent by the Royal Photographic Society.
4.....	South London .....	{ A Brief History of British Architecture. W. H. Dawson.
4.....	Stafford Photo. Society .....	Portraiture. M. Averill.
5.....	Bristol and West of England .....	Elementary Technical Instruction Meeting: The Negative. Henry Ormerod.
5.....	Gospel Oak .....	Demonstration: <i>Gravura</i> Paper. Paget Prize Plate Company.
5.....	Hackney .....	{ A Practical Lesson in Outdoor Photo- graphy. A. Horsley Hinton.
5.....	Redhill and District .....	Demonstration: <i>Kachin</i> Developer, <i>Velox</i> . Messrs. J. J. Griffin & Son.
5.....	Royal Photographic Society [ .....	Lincoln Cathedral. Frederick H. Evans.
6.....	Borough Polytechnic .....	Here and There with a Hand Camera. R. Child Bayley, F.R.P.S.
6.....	Croydon Camera Club .....	Secco Film.
6.....	Photographic Club .....	Demonstration: <i>Gravura</i> . Paget Prize Company.
6.....	Southsea .....	British Architecture. A. Fisher, A.S.A.
6.....	West Surrey .....	Demonstration: <i>Secco</i> Films.
7.....	Ashton-under-Lyne .....	Demonstration: <i>Dekko</i> and other East- man Papers. Robert Hobbs.
7.....	Camera Club .....	Photographic Surveying. Bridges Lee, M.A.
7.....	Ile of Thanet .....	Demonstration: <i>Gravura</i> . A.C. Baldwin.
7.....	Liverpool Amateur .....	Demonstration: The Evolution of a Snap-shot. F. Anyon.
7.....	London and Provincial .....	Elementary Composition and Perspective. W. R. Stretton.
7.....	Oldham .....	Lantern-slide Making. W. A. Nash.
7.....	Tunbridge Wells .....	Technical Control for Pictorial Results. W. Thomas.
7-9.....	Woodford .....	Members' Exhibition.
8.....	Borough Polytechnic .....	Practical Evening: Bromide Enlarging by Artificial Light.
8.....	Bristol and West of England .....	Demonstration: Films of the Secco Com- pany. Secco Film Company.
8.....	West London .....	Demonstration: Enlarging. L. Selby.
8.....	Whitby .....	Lecture: A Practical Lesson in Outdoor Photography.

### ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 28,—Technical Meeting,—The Rev. F. C. Lambert in the chair.

#### MR. WHEELER'S "METZOGRAH" SCREENS.

The ASSISTANT SECRETARY passed round two examples of the use of Mr. James Wheeler's "Metzograph" screens for process work, one of them a pull from the first block made with one of the screens, and the other a specimen of a print which will appear in the next issue of the *Photographische Correspondenz*. These screens are intended to impart an even and ungeometrical grain of any desired size, and are applicable to ordinary studio work or to process work. In the first case, they are placed with the grained surface separated from the negative by the thickness of an indiarubber band, and in process work the screen may be placed at the same distance from the plate in the camera, the exposure being the same as without the screen. A modification of the method of manufacture is applied for producing a kind of very fine ground glass for focussing screens, and also for reticulating ruby glass for diffusing the light of a dark-room lantern.

MR. SNOWDEN WARD said that, although Mr. Wheeler's screens had not at present been adopted by process workers in this country, they were used by several Continental firms with such success that they had recently sent orders for sizes up to forty by thirty inches. An essential advantage which they possessed lay in the fact that no opaque material was employed for filling up the inter-spaces, so that the light was not obstructed, but only diverted from its path, the exposure being thus reduced to about one-third of that required with screens of the ordinary character.

#### THREE-COLOUR LANTERN SLIDES.

MR. E. SANGER SHEPHERD read a paper on "Practical Three-colour Lantern Slide-making," and showed a number of slides produced by a method which he has recently brought to a high degree of perfection, the results being capable of projection by an ordinary single lantern. Having alluded to the work of Clerk-Maxwell in 1861, of Du Hauron up to 1875, and of F. E. Ives, he said that the present process was based on the fact that all the colours of

nature may be counterfeited, sufficiently nearly to deceive the human eye, by mixtures of particular red, green, and violet colours. The first practical step towards making colour photographs was attained when Dr. Eder and Captain Abney started the sensitising of plates for colour; and Captain Abney's new measurements of colour curves, when finally revised and published, would greatly simplify the work of colour measurement and materially help the attainment of really accurate results. In Mr. Ives's Kromskop process there was a mixture of coloured lights, but the method which Mr. Shepherd was describing was one in which three coloured films were superposed, the absorption of one print being thus added to the absorption of another; and for that reason the colours used by Mr. Ives for the three positive transparencies were not suitable in this case, in which the colours were respectively minus green, minus blue, and minus red. The screens for taking the three negatives, which are now on the market, could not have been made commercially without the aid of the colour sensitometer invented by Captain Abney; and Mr. Shepherd had devised a modification of a camera, designed in 1868 or 1869 by Du Hauron, with which the three negative images could be obtained of identical size and with one exposure. The positive transparency for the blue print was best made as an ordinary black lantern slide, afterwards toned blue with a solution sold with the apparatus for the process, and finally used as a cover glass. The pink and yellow prints were made on very thin and transparent celluloid films coated with bichromated gelatine containing a small quantity of bromide of silver, the latter rendering the image visible. After printing, the images were developed with warm water, and the silver removed by a weak hypo solution, leaving a picture in clear gelatine. The print from the negative through the red screen was then to be stained with a greenish-blue solution, that from the negative through the green screen in a pink solution, and that from the negative through the blue screen in a yellow solution. The pink and yellow images were next placed in accurate register upon the blue image on a lantern plate, and the whole bound together in the usual way. If, however, the slide were to be projected with a long-focus lens, this method of mounting would entail the scattering of a great deal of light and a consequent loss of brilliancy, and it was better in this case to cement the films together with Canada balsam. In the course of the evening slides mounted in both these ways were shown side by side on the screen, that sealed with Canada balsam having a very great advantage over the other.

In the course of the brief discussion which followed the reading of the paper,

MR. CHAPMAN JONES asked whether it was possible to over-stain the films by allowing them to remain for too long a time in the solutions, or were they correct when they had absorbed to their maximum absorptive power?

MR. SANGER SHEPHERD said the staining solutions were mixtures of different dyes, and were of such a character that they could be washed out of the films if it was desired to do so. If the three images were correctly stained, the deep shadows of the picture would be of a neutral tint, and, if this was not the case in a particular slide, the over-stained film could be placed in water for a few minutes and the depth of colour would be reduced.

MR. BOLAS thought the sealing of the films with Canada balsam was a distinct advance upon former methods; but

MR. SANGER SHEPHERD said it was introduced by Du Hauron.

The CHAIRMAN emphasised the importance of the investigations carried out by Clerk-Maxwell at a time when his name was little known outside of Cambridge University, and which would have been regarded then by many as very dry and unproductive mathematics. He was one of the men of whom to-day England was proud, and whose brilliant genius would be recognised even to a greater extent by those who would follow us.

#### COMING EVENTS.

December 5, Lantern Evening, "Lincoln Cathedral," by Mr. Frederick H. Evans. December 12, Ordinary Meeting, "Notes on the Use of Mr. Dallmeyer's Focometer," and also "The Origination of Printing Types by Photographic Methods," both by Mr. T. Bolas. December 19, Photo-mechanical Meeting, "Negatives for Three-colour Work," by Captain W. de W. Abney, C.B., F.R.S.

#### PHOTOGRAPHIC CLUB.

NOVEMBER 22,—Mr. E. A. Newell in the chair.

MR. F. H. CARTER showed prints toned in the ordinary sulphocyanide bath, and in the combined bath for comparative purposes. The results were certainly not in commendation of the combined processes of toning and fixing.

MR. JOHN H. AVERY demonstrated the method of working Secco film in his ordinary business, in which it had largely superseded glass plates.

Secco, it had been pointed out, was thirty years old at least, but Mr. Avery thought that he might say, at any rate, that at the present time it was a new departure. The method of preparing the film was briefly that a piece of paper was coated with a substratum, then with a layer of Secco film, and on that with the sensitive emulsion. The second film is simply Secco film coated on paper, and its use is as an auxiliary or protective film. The film is exposed in the usual way in the dark slide or roll-holder, a piece of card in the former case being used to keep the film flat. Card was sufficient for the purpose up to whole-plate, or even 12 x 10, but for bigger sizes a carrier was required. The speed of the emulsion was about eighty H. & D. It was up to the present of German manufacture, but the English Company would soon be turning out home-made supplies. After exposure, the film is placed in two per cent. of glycerine and water for a minute, and in this only does its preliminary treatment differ from that of plates. The solution keeps the film from curling. Pyro ammonia, or anything, in fact, could be used for development. After fixing and washing, a piece of the auxiliary film is soaked in the glycerine solution for a time, then the negative is drawn up in contact with it, lightly squeezed, and allowed to dry in between blotting-paper. The negative is now enclosed between two sheets of paper. It is best to trim away all roughness of edge before stripping, an operation which is simplicity itself. One then has a negative film which is protected by two layers of Secco film, one on each side,



of an entire thickness of one five-hundredth of an inch. It is non-inflammable. It can be crushed up into a ball in the hand, and ironed out flat again. Both sides may be retouched without medium. The negative may be printed from either side. It can be made in any length. There is no possibility of halation, and a print from a plate and a film were shown to bear this out. The subject was identical, but the glass negative was very poor on account of halation effects. As regards intensification or reduction, this should be done before the auxiliary film is applied. If the necessity for intensification or reduction is not perceived until after the stripping, the operations previously described may be reversed. The negative is soaked in glycerine solution. Pieces of auxiliary film are squeezed to it, and then separated, so that the emulsion film is exposed again. The intensification may then be effected. Mr. Avery showed the operations required, and passed round many negatives and positive transparencies, and enlargements and prints were placed around the room.

**Croydon Camera Club.**—Between twenty and thirty members attended on Wednesday, the 22nd ult., to hear a talk by Mr. A. C. BALDWIN upon

THE GRAVURA PRINTING PROCESS AS APPLIED TO PAPER, OPAL, AND GLASS.

Although in the main manipulations are akin to what are gone through with similar types of paper, some variations were noticed. Gravura, like Velox, may be handled in the ordinary light of a room lit by gas or electricity, yet, strange as it may seem, a mere half-inch of magnesium ribbon burnt at a distance of thirty inches will strike right through the negative and impress the paper, so that, on taking it from the printing frame and placing it into a reducing solution, a full black image immediately appears. A print may thus be exposed and developed inside half a minute. The paper, opal, or lantern plate will not only print black, but, without any further treatment than development, will yield brown or red tones. To obtain these, instead of half an inch, if three inches of magnesium are burned, brown tones ensue, while, if four inches be used, the tone is that of red crayon. In each of these two cases the developer is somewhat diluted, and carbonate of ammonia added to it. With brown tones the development takes a normal time—a minute or more—so that it may be watched and controlled. It is preferable, if in doubt, to over-develop, the print being easily reduced after fixing by employing a diluted solution of Farmer's reducer (ferricyanide of potassium and hypo).

**Baling Photographic Society.**—November 20.—Mr. J. T. SANDELL, of the Sandell Film and Plate Company (Limited), attended for the purpose of giving a demonstration with

#### THE NEW PERFECT FILM

which the Company are about to place in the hands of photographers. Mr. Sandell prefaced his demonstration with a display of lantern slides and prints illustrative of the capabilities of the well-known multiple-coated plates which bear his name. The slides, which numbered about 100, were reductions from negatives of Mr. Sandell's own taking. In definition, technique, and *vraisemblance*, the slides could hardly be surpassed. In commencing his demonstration, Mr. Sandell explained that the Perfect film corresponds to the Sandell double-film plate, consisting of a slow and a rapid emulsion superimposed. The new film is composed solely of the two emulsions without any "support," and development consequently proceeds from both sides, with the result that the time for development and subsequent fixing is materially shortened. Mr. Sandell proceeded to develop four films simultaneously which had been exposed for 1, 5, 60, and 300 seconds respectively, and the result proved the very considerable latitude which the new films allow in exposure.

**Richmond Camera Club.**—November 13.—Lecture by Mr. H. T. MALBY, F.R.P.S., on

#### THE PHOTOGRAPHING OF FLOWERS,

illustrated by some fine lantern slides, was read. Mr. MALBY advocated the use of isochromatic plates, aided in some cases by coloured screens, but he warned his hearers against the indiscriminate use of the latter, and showed, by means of slides, that the truest results were often obtained by the use of the plate without the screen, pictures so taken being compared with the same subjects taken with a screen, in order to show the over-correction of the colours produced thereby.

NOVEMBER 20.—A paper, by Mr. A. HORSLEY HINTON, on

#### PLATES AND PAPERS FOR PICTORIAL PHOTOGRAPHY,

was read. Mr. HORSLEY HINTON strongly advocated the use of isochromatic plates, and, where possible, of a slow plate. He preferred platinum to any other printing process, and described his method of printing by means of a board covered with cloth, on which the paper, with the negative above it, was laid, the position of the negative being fixed by six stout pins, two on each of three sides of the negative, passed through the paper and cloth into the board. This allowed the negative to be removed bodily, and replaced in exactly the same position as before, and the whole of the print could consequently be seen at once. He also described his method of printing in a sky or figures from another negative, and of controlling the action of the light by means of tracing paper on the back of the negative, blackened with charcoal where necessary.

**Liverpool Amateur Photographic Association.**—November 16.—A lecture was given by Mrs. E. MAIN. Mr. Paul Lange presided, and there was a large attendance. The lecture was a demonstration in photography, as well as an interesting chat about a summer tour among the mountains and fjords of Norway. Mrs. Main has climbed precipitous mountains, and tramped almost interminable glaciers, where nothing was visible but eternal snow, and bare, bleak, craggy mountains, whose serrated peaks spread around her on every side with appalling ruggedness and wild grandeur. All these things she discoursed pleasantly upon for a couple of hours, illuminating her story with many humorous touches. About a hundred pictures were shown, all of which, as well as the slides, were done by herself. Mrs. Main is an enthusiastic mountaineer, and a very competent photographer. Some of the cloud effects obtained by her are wonderful, and her rendering of snow scenes was no less magnificent. She was rewarded with a cordial vote of thanks.

NOVEMBER 25.—Mr. HARRY WADE, of Manchester, read a paper on  
INTENSIFICATION AND REDUCTION.

Mr. Wade told his hearers that photographers were too fond of using one formula for all kinds of intensification and one kind of formula for all kinds of reduction, and gave several formulae for each. These varied for intensification from the well-known mercury and ammonia to the lesser-known methods of redevelopment by means of cyanide of silver, and for reduction from the well-known Farmer reducer to the newer methods by means of persulphate of ammonia and permanganate of potash. Mr. Wade, whose remarks were listened to with great attention, passed round specimens of negatives intensified or reduced by each of the methods he advocated, and at the conclusion gave a practical demonstration of his various formulae.

**Rotherham Photographic Society.**—November 21.—Mr. T. G. HIBBERT (Hon. Treasurer of the Sheffield Photographic Society) dealt with the subject of

#### GOLD TONING OF P.O.P.

Mr. Hibbert's method is to make use of old sulphocyanide and gold baths strengthened as required. The addition of two or three drops of gold solution affords clue by colour as to which of the two chemicals is requisite.

**Southsea Amateur Photographic Society.**—November 22.—A demonstration of Eastman's Dekko paper was given before the members of this Society by Mr. PERCY HUME. After the demonstration, the HON. SECRETARY stated that he had made arrangements with Mr. H. Snowden Ward to give a lecture on "Dickens Land." He pointed out, however, that such a lecture should prove extremely popular if given in a large public hall in Portsmouth, which was Dickens's birthplace, and was closely associated with the great author. He asked for the co-operation of the entire Society in forming a committee to guarantee the expenses, and proposed that the entire profits of the undertaking given under the auspices of the Southsea Amateur Photographic Society should be handed over to the South African War Fund for the benefit of the widows and orphans of those killed in active service. This met with the entire approval of the members present, and over six guineas were collected at once towards the guarantee fund. Mr. MORTIMER then stated that he had entered into communication with the Mayor of Portsmouth for the hire of the Town Hall for December 12 next for the purposes of the lecture, and drew attention to the fact that the hall was one of the largest in the south of England, seating over 2000 people, and that, to make the affair a success, every one would have to work hard, as the time was short. On Saturday afternoon the HON. SECRETARY gave a practical demonstration of daylight enlarging with the Society's enlarging apparatus, and afterwards gave further particulars and details of the Dickens lecture, and distributed circulars and tickets to the members for them to sell, and everything seems to promise success for the venture.

**Carbon Portfolio Club.**—The Annual Meeting was held on November 23, when the following gentlemen were elected Councillors for the ensuing session:—*President:* Dr. H. Scott Lauder, R.N.—*Council:* Messrs. W. J. Croall, C.A., J. Warrack, jun., Douglas Croall, and T. Knoblanck.—*Secretary and Treasurer:* Mr. Stewart Wallace, W.S. On the motion of Mr. Eddington, a cordial vote of thanks was accorded Mr. James Hay, the retiring President, also to Dr. H. Scott Lauder for his most efficient services as Secretary during the past two years. The financial statement showed a satisfactory balance in hand. At present there are no vacancies, the membership of the Club being at full strength. A proposal to increase the limit of membership was not favourably received. In the course of the evening Mr. Douglas Croall presented a handsome leather portfolio to the Club, so that in future prints varying in size might be passed round. Several members spoke of the valuable criticism received and of the experience gained through being connected with the Carbon Portfolio Club. It was also felt desirable that members should investigate any new and at the same time permanent printing process.

#### FORTHCOMING EXHIBITIONS.

1899.

December 1-18 ..... American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.

" 7-9 ..... Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.

" 11-Jan.1900 Huddersfield (Invitation). W. A. Beevers, Cloth Hall-street, Huddersfield.

" 27-30 ..... Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.

1900.

January 29-31..... Southsea Amateur Photographic Society. F. J. Mortimer, 10, Ordnance-row, Portsea.

April 3-7 ..... Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.



## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### PRINT-WASHERS.

To the Editors.

GENTLEMEN,—I note a question, by one of your correspondents in your JOURNAL of November 3, as to a good print-washer for professional use. May I take this opportunity of recommending a washer which I have used for about twelve months, and which I have found to give great satisfaction, namely, Marion's sectional print-washer? I believe most photographers wash for two hours, but I consider one hour to be ample with this particular washing apparatus.—I am, yours, &c.,

A. E. STANLEY.

10, Ewart-road, Bedminster, Bristol, November 20, 1899.

### SPOTS ON MATT-SURFACE PRINTS.

To the Editors.

GENTLEMEN,—I am much interested in the letter of last week's JOURNAL re spots on matt-surface prints. I am troubled in the same way exactly. I have used the same brand of paper for nearly three years, and it is only quite recently these markings have shown themselves. I can honestly say, with the writer of the letter in your JOURNAL, that I have taken every possible caution that I can think of, and still they appear, and only after mounting a few days. Fortunately, I have detected before sending prints out, but there still remains the possibility of spots appearing after prints have been sent home to clients. If any of your readers have had the same trouble, and overcome it, I for one shall be most grateful for any information that they can give. I have been a regular subscriber to your paper for nearly twelve years, and value very much any hints and sound advice that you so often give us. Thanking you in anticipation,—I am, yours, &c.,

PROFESSIONAL.

### THE HACKNEY EXHIBITION AND THE HAND CAMERA.

To the Editors.

GENTLEMEN,—I know that I am getting an old man, and so I feel grateful to your Hackney Exhibition reporter for bringing me back to at least twelve years ago. I feel quite young again, and fresh enough to go for him. Time was when I championed the hand camera against all and sundry, but these last few years have seen such a growth of hand-camera work that my mission was absolutely smothered. It is refreshing to hear the bugle-call of war once more, and, as an old horse, I cannot resist the call to arms. Moreover, I will promise you, gentlemen, that there shall be no misuse of the white flag. Your reporter's exclusive report is to the effect that a certain picture of mine in the hand-camera class, which gained an award, might just as well have been taken in a stand camera, because it shows no evidence of motion. He therefore takes it, I presume, that the hand camera should only be used to do something that the stand camera will not do. Well, now, I put it quite the other way. If the picture in question had been a stand-camera result, I should have written, had I been your reporter, that it might just as well have been taken in a hand camera, so as to prevent the necessity of lugging about a tripod and focussing cloth, the focussing, and the crowd of passers-by, who throng round the apparatus. Why, then, take a stand camera when a hand camera will do the work?

The question as to "time" exposure is too much for me, as it is put in such a loose fashion, for all exposures can be timed.

It is rather curious that, just at the end of my exhibiting career, in about the last competition I shall take part in, I gain an award, and your reporter tackles the hand camera. This is a curious and incentive combination, compelling me to occupy space in your columns. But, as it may be thought that there is something behind the criticism (people have a knack of surmising a thing of this sort), I must add that the picture in question was strictly in accordance with the rule governing the class, viz., "work done with a camera held in the hand, without other support than that of the body." It was taken from the ordinary street pavement in a Tella hand camera lens at full aperture (approximately f-6), and longest automatic exposure (approximately one second). There were three gentlemen with me at the time: Mr. Rogers, Hon. Secretary of the Croydon Camera Club; Mr. Newson, Hon. Secretary of the Fakenham Camera Club; and Mr. William F. Slater, of Lee, S.E.

As to the advisability of holding a hand-camera class at all, that is a matter for the Hackney Photographic Society, which is well able to take its own part: but I might add that objections to such a division, and to hand-camera work generally, usually spring from men who do not use hand cameras, and who therefore are not capable judges.—I am, yours, &c.,

WALTER D. WELFORD.

19, Southampton-buildings, Chancery-lane, W.C.

### ORTOL.

To the Editors.

HELLO, COLONEL.—I observe from the photographic papers of the world that a straight boom is on with the new developer, ortol. Being a Chicago citizen, and an amateur photographer of no mean repute, it struck me that your friends across the Herring Pond might reckon to note the experiences of a brother in the cult.

Well, here goes curtly, as I have no desire to take up too much of yours as well as my own time.

I selected one of the warmest days of our Michigan summer for my experiment with ortol. Outside, even under shade, the heat made one frigid. I started right away in my dark-room, and developed, perhaps, the best of a dozen exposed plates, and by the time I was half way through, the heat, even in my shirt sleeves, made me think, and don't you forget it. That Chicago sun was blazing on the roof of my dark-room in such a pertinacious manner that the water in the washing trough was hot enough for sepiá plat, and, Siree; it was under circumstances such as these that ortol stood the test. With this more than warm water streaming on the developed plates, one would have under almost any circumstances reckoned on bad frilling, but with ortol, no, Sir; after final washing there was not the slightest trace of it, and for this reason, if even this alone, I recommend ortol. And now, Colonel, I must quit, but should you ever cross to the U.S. be sure you come to Chicago, and I will show you round, and if you don't put in a good time it will be your own fault, and don't you forget it. My address is 17th-street, Section 46. Should you have trouble in finding, mention my name to the nearest constable.

And so farewell, yours, Senator JONATHAN WIDE-AWAKE.

Sports Club, Exchange-square, Chicago.

### THE ECLIPSE PHOTOGRAPH AT THE R.P.S. EXHIBITION.

To the Editors.

GENTLEMEN,—In your issue of the 13th ult. there appears, under the above heading, a letter from Lieut.-General Tennant, which please permit me, being the author of the photograph in question, to reply to.

General Tennant disputes the accuracy of the subject, with evident assurance on his own part, when he says "How the photograph was made I do not attempt to say, but I am quite certain it does not represent any phase of a solar eclipse, either at Quetta or elsewhere." This is tantamount to saying that the disc, as seen in the picture, is a "faked" arrangement, and literally accuses the "Royal" of accepting a photograph with no relation to the title applied to it. I will tell him exactly how the photograph was made:—

The camera employed was an ordinary (not solar) 12×10 one; the lens a Dallmeyer's 12×10 rapid rectilinear (not wide-angle), using the smallest stop, and without placing any coloured screen in front of the lens to soften or otherwise reduce the intensity of the light, there being great banks of clouds moving about, which, of course, I did not wish to lose. The lens was uncapped in the usual way, by hand, as quickly as it could be done; the plate was one of ordinary kind (not isochromatic) and sensitiveness, and the development slowly effected with pyro and ammonia. We are told by the General that the result obtained is reverse to what should be. I have in my possession several pictures of the eclipse, taken on the same day at Quetta by amateurs, and, although the results are indifferent, nevertheless the light encircling the black disc has the same appearance. This may also seem strange.

Should General Tennant still doubt the accuracy of the photograph, I am prepared to show him, or any one deputed by him to call on me, the original negative, which is in every detail an exact facsimile of the enlarged copy on view at the Exhibition.

Perhaps a more careful scrutiny of the picture (photographically) will convince the General of its technical correctness.—I am, yours, &c.

Quetta, Baluchistan, Nov. 6, 1899.

F. BREMNER.

To the Editors.

GENTLEMEN,—I have read in your JOURNAL of October 13, 1899, a letter from Lieut.-General Tennant on the subject of Mr. Bremner's photograph of the Solar Eclipse as seen in Quetta last year. This picture appeared in one of the London illustrated papers in the early part of last year, and, being greatly struck with it, I asked Mr. Bremner, in April 1898, to show me the negative. I know nothing about eclipses, but I have some years' experience of photography, and I can assure your readers that this negative had not been retouched or "faked" in any way whatsoever.

I have since been shown some amateur productions of the same subject which are in Mr. Bremner's possession, and the effect is precisely similar.

In justice to Mr. Bremner, I trust you will publish this letter, which has not been written at either his suggestion or invitation.—I am, yours, &c.

J. F. FORBES, Capt. 1st Wiltshire Regt.

Quetta, British Baluchistan, Nov. 4, 1899.



## LEAD PLASTER.

To the Editors.

GENTLEMEN,—In your Correspondence pages this week I see that "Varna" has mistaken Mr. Bolas's meaning in the term "lead plaster." Technically, I believe, all the combinations of metallic oxides (other than the usual alkalis) with oleic acid, are called "plasters." Lead plaster is one used in medicine. Watts states that it is flexible and tenacious in summer, but brittle in winter. If spread on a surface and warmed, no doubt films would adhere to it easily.—I am, yours, &c. J. F. T.

## SPOTS ON PLATINOTYPE PRINTS.

To the Editors.

GENTLEMEN,—Most probably the spots on platinotype prints that Mr. C. H. Ellis complains of, in your last week's issue, are caused by particles of soot settling on the negatives when printing, thereby keeping the light from acting on the paper directly beneath these particles.

Having had experience in printing in several large towns, I have found that at this time of the year soot is most troublesome, and will settle on printing frames placed outdoors, especially on a roof, and, unless it is blown off occasionally, will leave its traces in the form of a white spot on the print.—I am, yours, &c. M. E. MITCHELL.

Tonbridge, Kent, Nov. 27, 1899.

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

## PHOTOGRAPHS REGISTERED:—

J. Rayne, Glendale Studio, Maldon, Essex.—Photograph of Miss E. H. Smee.

A. F. Clouston, Victoria-street, Stromness, Orkney.—Photograph of Stromness in fishing time.

E. H. Roberts, 30, High-street, Marlborough, Wilts.—Photograph of the Marlborough town beadle and choir.

INQUIRER.—Address the Platinotype Company, Bloomsbury-street, London.

E. H. ROBERTS.—We believe the maker named is dead; at any rate, he is not now in the business.

A. B. C.—1. We do not know either the lamp or the address of its makers. 2. Messrs. Thorne &amp; Hoddle's address is Tothill-street, Westminster.

MR. L. W. ELLINGTON (of Broadwell, near Rugby) desires to communicate with Mr. W. A. Gain, who wrote us last week on the preservation of potatoes.

PRINTS FOR PROCESS WORK.—ERIMUS asks: "To get the best results, should prints be used for process work be burnished or unburnished?"—Of very little moment so long as the surface is smooth and even."

ADDRESS OF A SCULPTOR WANTED.—W. D. asks for the address of a sculptor who undertakes to produce carved busts from photographs.—In reply: We are sorry we cannot give the information, which, however, some reader may supply.

THREE-COLOUR WORK.—H. ERNST says: "I wish to try three-colour photography. Would you be kind enough to give me your valuable advice with regard to the three negatives? When using the yellow screen, is the negative produced for yellow colour and the same with the red and violet screen negatives?"—In reply: Let our correspondent consult a paper in this JOURNAL for September 15 on the "Photography of Colour," and he will find an admirable résumé of three-colour theory and practice.

\* COPYING OLD POSITIVES.—G. BRIMMELL says: "I have received from a customer some old glass positives to copy, but the images are so dark all over that it is useless to attempt to copy them in their present state; can you tell me how and with what to bleach the image white again? I have tried them with the following formula: Terchloride of mercury, 1; bromide of potassium, 1; water, 50; but with no effect whatever."—Probably the pictures are varnished, and for that reason the solution has had no effect, and possibly so much the better for the pictures, for it is a very risky thing to tamper with old glass positives. Probably, if the black varnish at the back were removed, the pictures could be used as negatives and copies made in that way. Any how, make no further attempts to bleach them.

STAMP PORTRAITS.—LIVERPOOL. Cameras, and all the necessary appliances for taking these portraits, are supplied by Fallowfields, and, indeed, by most of the large houses.

PHOTO-RELIEFS.—M. O'CONNOR writes: "I want to make some electrotype medallions from plaster casts taken from gelatine reliefs. Can you tell me the best battery to use for the electrotyping? I am told that the Daniel is the best."—The Daniel battery is very good for the purpose, but we should prefer the Smee's. The latter is the one that is most in use by professional electrotypers who do not use the dynamo.

MATT VARNISH.—W. RESKER sends us a transparency backed with matt varnish, prepared according to the formula given in the ALMANAC, and complains that the grain is too coarse, and asks if it is possible to produce a finer one. Yes, it is, by simply adding less benzole. The larger the proportion of benzole used the coarser will be the grain, and the smaller the quantity the finer it will be.

LITHOGRAPHIC TRANSFERS.—J. R. FOX. If the ink, supposing it to be of the proper kind, will not wash off the paper when treated as you have done, it is clear that the paper is at fault. Either it has been much over-printed, or the gelatine has become insoluble, or non-absorbent of water before printing, possibly through too long keeping. The formula is right, and the gelatine used is of the right kind. Try again, and dry the paper quickly, and use it shortly after sensitising.

CARBON PRINTING; ROUGH PAPER.—CARBONENSIS asks: "Where can I obtain some rough Cresswick drawing-paper, prepared as single transfer paper, for carbon printing? I have inquired of several dealers up north, and they tell me that they have never heard of such a thing."—Probably the Autotype Company, or Messrs. Elliott & Son, will supply it. If they cannot, we do not know where you can get it, unless you prepare it for yourself.

STUDIO BUILDING.—INQUIRER says: "Will you kindly advise me as to best position and size of lights for studio 10x18 feet? Is it better to have both sides of roof at the same angle or not? Studio will stand east and west."—As the studio will be so small, we should say, Have both sides of the roof at the same angle. Have, say, four feet at either end opaque, and the rest glass. The south side, for easy working, need not be glazed, as both ends could be used as the background end according to the light.

CLEARING AN ORTOL-DEVELOPED PLATE.—REV. J. CARTER BROWNE says: "Having developed a Marion's plate with ortol, I put it straight into the hypo; when cleared, noticing a slight veil, I treated it with clearing solution (citric acid and alum), and placed in water to soak. In about an hour I found nearly all detail gone, and scarcely equal to a positive remaining. What caused this?"—We are sorry we cannot say the actual cause. Possibly the clearing solution was very strong, or the plate was left in it too long; or there may have been some disturbing cause beforehand, for ortol-developed negatives should not be veiled. Not necessary to print the address, thanks.

STUDIO BUILDING.—STUDIO says: "Thanks for answer in JOURNAL re studio building, but, as the sketch sent does not make it clear to you, I shall ask you to pardon me for again trespassing on you. The proposed studio is to be converted from a place already built, therefore reason of roof from floor to ridge being so high. As it is unnecessary to carry glass from eave up the whole length to ridge, how far up would you suggest it to be carried? If I carry glass four feet from background end, this will reduce me to eight and a half feet glass; would this not be too little to be confined to for groups? The light would be from the north-east."—We did not retain the sketch, therefore we have but a vague recollection of what it was. It would certainly not be necessary to carry the glass up to the full eighteen feet from the floor, probably not more than ten or eleven feet, even for groups. But we can give no definite opinion from the data before us.

ENLARGING.—HAND CAMERA says: "Referring to your report on p. 746, 'Enlarging Simplified,' do you think such an apparatus could be adapted to an ordinary hand camera, with lens in a focussing jacket? The black part of the sketch is the plan of the camera, and what I proposed was to make a square tube the size of the negative to push into the camera with the lighting apparatus, as described, at the rear. But what I cannot discover from books of reference is whether it will work with a hand camera. The lens is in a focussing jacket, but is it necessary to have a bellows camera to extend to considerable lengths?"—Such an arrangement as shown in the sketch will answer very well, provided the camera will lengthen sufficiently to enable the lens to be placed far enough from the negative. If not, a cone or extension will be necessary on the front of the camera. On this point, consult the table of enlargements and reductions on p. 1092 of the ALMANAC for the current year.

SPOTS ON PRINTS.—CLUTHA says: "Can you give me any information re marks on enclosed prints? They are matt a.c. platino-toned. The marks do not appear until the prints are mounted and dry, and in some cases two or three days after being mounted. Have tried everything before putting the blame on to the mount, but have come to the conclusion it must be the mount that is at fault. Have only just got the mount, and had no trouble before starting to use this mount, and prints from same batch, mounted on other mounts, show no trace of the markings, so can see no other cause to put them down to but the mounts. Have enclosed some of mounts without prints."—Without testing the mounts, which we have no time to do, we can express no opinion upon them; but we see no reason to suspect them, inasmuch as two of the spots show unmistakable evidence of careless manipulation. They are decidedly finger marks, while the finger was contaminated with some injurious matter. Of the finger marks there is no question whatever.



# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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for constant reference, a fund of technical knowledge which is not to be found in any other photographic annual.

\* \* The 1899 Edition of the Almanac (20,500 copies) was entirely exhausted within three months of publication—a fact without precedent in the history of photographic publications.

## EX CATHEDRÂ.

THE catalogue of the second Philadelphia Photographic Salon, an Exhibition which closed on the 19th ult., has been sent to us. Besides giving a list of the 350 exhibits, the catalogue includes twelve half-tone reproductions from the photographs shown. Of the twelve, the majority are old friends in this country; and the work that is new to us, if good, is not exceedingly striking. The catalogue tells us that "the purpose of the Salon is to exhibit that class of work only in which there is distinct evidence of individual artistic feeling and execution." Thirty-one out of the 120 exhibitors were specially invited by the management to exhibit without submission to the Jury.

\* \* \*

PROFESSOR R. W. WOOD, of Wisconsin University, writes to Sir Henry Trueman Wood that he hopes to be able to let the Society of Arts have his promised paper on the "Diffraction Process of Photographing in Colour," by the end of February. Professor Wood hopes to come over himself; but, as he is not quite certain to be able to do this, he promises to send, in any event, a communication, together with specimens of the pictures, and a number of viewing instruments. He is hard at work on the process, and has overcome some of the initial difficulties. His principal difficulty now is to get perfect gratings ruled to arbitrary spacing.

\* \* \*

IN our issue of the 17th ult. we referred to the report of the Chief of the Fire Brigade of a serious explosion of what was said to be six pounds of chlorate of potash, by which seven persons were injured, four of them seriously, and at the same time we made some comments on the report of Colonel Ford, Her Majesty's Chief Inspector of Explosives, with reference to the lamentable catastrophe at St. Helens. In this report the

## THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1900.

Edited by THOMAS BEDDING, F.R.P.S.

THE Thirty-ninth Annual Issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC is now published. The volume reaches the unprecedented total of 1516 pages, and is the largest yet produced. As hitherto, it is issued in paper covers, price 1s.; cloth bound, 1s. 6d.

The frontispiece is a bromide print by Messrs. Wellington & Ward, of Elstree, from a negative by Mr. H. Walter Barnett, of No. 1, Parkside, Knightsbridge. Many other illustrations are also given in the text matter.

Eighty articles, on a great variety of subjects interesting to photographers, and contributed by the principal authorities of the day, form a feature of the volume. The other sections are "Epitome of Progress during 1899," "Patented Inventions of the Year," "Miscellaneous Information," "Practical Notes and Suggestions of the Year," which, with the large collection of formulæ, tabulated matter, and a great deal of other information of use to all photographers, places at their disposal,



Colonel said that under certain conditions "the salt is liable to explode." Since the accident at Dalston one of the injured has died, and an inquest was held last week, when a verdict of accidental death was returned. But at the inquest it transpired that the chlorate had been used in the manufacture of coloured fires, and probably it was an admixture, and not the chlorate by itself, that caused the accident. We have often cautioned our readers as to the dangerous nature of flashlight powders, used as an artificial light in photography, when they contain chlorate of potash or similar substances. According to an evening contemporary, the proprietor of the premises in which the accident occurred is to be prosecuted by the L.C.C. for contravening the Explosives Act, the penalty for this offence being one hundred pounds. Those who make flashlight compounds will do well to keep this Act, and its penalties, in mind.

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THOSE who possess genuine works by Vandyck in this country are naturally very proud of their possessions, and when they change hands they always do so at high prices, and often not to remain in this country. England, as represented by our National collections, is not by any means overstocked with Vandycks, although much of his finest work was executed here. We see by the Law Courts reports of last week there was an application in the Appeal Court with reference to the sale of some of the Peel heirlooms, in which a couple of Vandyck's works are included. It was then stated that, in the opinion of experts, these two pictures would not realise more than from six to seven thousand pounds, for in no case had a work by this master, at auctions in this country, realised more than 3500*l*. However, the present owner had been offered, privately, 11,250*l*. for them. Whatever Vandyck's pictures are said to have been sold for at auctions, we do know the *very* high prices that have been paid for them at private sales—much higher than that said now to be offered for the two in question. Mostly, when old masters are sold now, they go abroad, chiefly to America, and are lost to this country. Will this be the case with these two Peel heirlooms if the Court permits their sale, whether privately or at auction? Although our National and Municipal galleries are very devoid of Vandyck's work, the Queen has a fine collection of them, both at Windsor and at Buckingham Palace; but it is only at the former that the public have the opportunity of seeing them. The Court has since decided that the pictures must be sold at auction and not privately.

\* \* \*

ACETYLENE is certainly not gaining in repute. Another fatal accident with it has occurred, this time at a chateau in Brussels. It appears that the owner had installed an acetylene generating apparatus in a small tower of the building. The report says that the gas escaped from the reservoir, and the *concierge*, with the lady of the house, entered the apartment with a lighted lamp, when an explosion of the gas took place, killing the *concierge* and severely injuring the lady. The tower was also demolished. In this case it is clear that the acetylene was mixed with air in explosive proportions, and common coal gas would, under the circumstances, have behaved in precisely the same way as the acetylene did. There is, however, this difference, coal gas is not usually generated on the premises, whereas acetylene is; hence we hear of more accidents with the latter than the former. In the small portable apparatuses used for generating the gas for lantern purposes, if used with only ordinary care, there need be no danger; but we fear that these

frequently reported accidents will, to some extent, militate against their employment—and more is the pity—when ordinary precautions are fulfilled.

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It is somewhat a novelty to see a sailor using a camera and tripod stand. But we read that on the departure of our late Imperial visitors there was a German sailor in evidence to secure photographs of the event. It turns out that he is the same man who so successfully defied the Portsmouth police when the Royal party landed on their arrival here, and it appears that he was specially employed by the Empress to obtain views of the Imperial journey for her Majesty's private album. However, there is no little novelty in seeing a sailor at work with tripod and camera. It is said that the man takes away with him pleasing impressions of his stay in England, but regrets that the atmosphere here greatly militates against successful photography. This one can readily understand when it is considered that the visit was made in November, and the kind of weather experienced during the stay. Doubtless he has plenty of "atmosphere" in most of his pictures, though we doubt if that class of work is much appreciated in the Fatherland.

#### A NEW ACTION OF LIGHT.

FOR some time past considerable attention has been drawn to the subject of lightning flashes, and, more especially, to the form known as dark flashes, as seen on photographic negatives. Lord Kelvin has given a personal experience of how he saw dark flashes, which, however, were merely persistence of vision and tired retina effects. At the same time many negatives, undoubtedly genuine and non-faked, are in existence showing dark flashes, and the question has arisen, "How do they come to be there?" A thoroughly satisfactory explanation was given some little time ago, and has formed a starting-point for investigations by other observers. It is as follows: If a plate be exposed to a lightning flash, and then slightly fogged by light, the flash, instead of coming out on the negative as an opaque streak on a foggy background, is represented by almost clear glass; but, if the fogging is done before exposure to the flash, this curious reversal does not take place, and the negative appears just as it might be expected to do. A similar appearance can be produced when photographing an electric spark; but we have but the recent one we are about to refer to of experiments giving these reversed or Clayden effects by other means. A long illustrated article by Mr. William S. J. Lockyer appeared in *Nature* of the 12th inst., describing and explaining a number of lightning photographs, and recounting experiments with the spark from a ten-inch Apps coil with a pint jar in circuit. The spark negative possessed all the peculiarities of the lightning negatives taken under similar conditions.

In last week's *Nature* the subject is continued in a letter from Mr. R. W. Wood, of the Physical Laboratory of the University of Wisconsin, who describes a series of cleverly devised and well-carried-out experiments, which have led him to a conclusion from which it is difficult to escape, but which is one of the most remarkable in the records of the photographic action of light. This conclusion is of the highest importance, and we may expect to see it further dealt with by other experimenters.

Mr. Wood, like Mr. Lockyer, obtained the Clayden reversals when using a spark from an induction coil with a jar in cir-



cuit, but did not rest there; he tried to get reversals, from other sources of illumination. For some time he failed, though he used several sources of illumination, including an oxygen-hydrogen explosion, the light from which he estimates to have a duration of  $\frac{1}{12000}$  second. But that was not brief enough. Finally, by means of a revolving opaque wheel with a radial peripheral slit passing, at intervals of  $\frac{1}{60}$  second, a corresponding powerfully illuminated slit in an opaque screen, he was able to secure an impression representing  $\frac{1}{55000}$  second, which approximates to the rapidity of a lightning flash. The illumination of the slit consisted of a beam of light from an arc lamp focussed by a large convex lens of short focus. Here again he obtained reversal, and the remarkable conclusion referred to was forced upon him by the facts. Mr. Wood writes: "It seems, then, that we are justified in assuming that the action of an intense light on a plate for a very brief time interval decreases the sensitiveness of the plate to light." If this conclusion should be confirmed by other observers, it will be the beginning of an entirely new chapter of photographic action.

#### A RIVAL TO CELLULOID.

NITRATED cellulose has long held the field as the basis of a flexible glass, as celluloid has been called; but there seems a probability that before long Messrs. Cross & Bevan's invention, aceto-cellulose, may be found a formidable rival, for it possesses many advantages over the pyroxyline which, in combination with camphor, is the main constituent of celluloid. We learn from a foreign journal that the manufacture of tetracetate of cellulose has, during the last few years, made rapid strides, as also has the butyrate, which is a somewhat analogous substance, the substances being now produced on a large scale.

Perhaps the most conspicuous quality of the acetate, compared with the nitrate, is its non-inflammability—it burns very imperfectly. It differs further from the latter in that it is insoluble in methylic and ethylic alcohols, acetates of amyl and ethyl, acetone, and ether, but is soluble in benzoate of ethyl, chloroform, epichlorhydrine, acetic anhydride, glacial acetic acid, and nitro-benzine, the solution in the latter becoming a solid, completely transparent jelly. The solution in the other named liquids can be diluted with acetone without precipitation taking place. The aceto-cellulose resists most reagents in a remarkable manner. Dilute acids and alkaline dyes destroy nitro-cellulose, but, with exception of dilute nitric acid, do not act upon the new substance, in some cases even when boiling.

It is probable, too, that, used as a basis for films, it will be possible to dry them quickly by the aid of alcohol in the usual manner, a process quite out of question with celluloid, as any one knows to his sorrow who has tried it. The acetate does not change by the action of heat below 300° F. The hydrate of cellulose possesses very similar properties, but is more soluble in the liquids named, and is also easily soluble in acetone and in acetate of ethyl. The butyrate is very similar to the acetate, but the filaments formed from it are softer and more flexible. From all these facts the journal alluded to predicts that the new substances will be powerful rivals to celluloid, and especially in cases where non-inflammability is an important consideration. Finally, it is anticipated that they will form excellent lacquers for metal, their resistance to moisture, heat, and chemicals being far above that of the usual

basis; of course, any colour can be given to them that may seem desirable.

**Preserving Brasswork from Corrosion.**—The use of the old lacquers where moisture or chemical fumes are absent is very effective in preserving the appearance of polished brasswork, but in the case of delicate articles used in a laboratory, such as brass weights scale beams, and so forth, it has been the custom to gild the surface in lieu of lacquering. Recently, however, Mr. W. A. Allen, of the State School of Mines, Rolla, Missouri, has made public a case in which a set of such gilt weights put away in a box, but evidently in a damp condition, in a safe for less than three months, were corroded and covered with a white incrustation, and he raises the question whether gold-plated weights are, under ordinary working conditions, preferable to brass.

**Astronomers on the Missing Star Shower.**—It is very disappointing to every one, and especially the astronomers, that the long-talked-of and expected "shower" of meteors did not occur, at least in the night time, as is quite evident was the case, for in several places the possibilities of observation were excellent. When the last great shower occurred, our older readers may remember, considerable uncertainty as to the exact year when they were to be expected was manifested, and, in like manner, on the present occasion, as our previous remarks have narrated, a similar absence of certainty was felt. To avoid complete disappointment, we may say that skilled astronomers still bid us hope to see the "shower" next year. The Rev. C. L. Tweedale writes to the *English Mechanic* that he thinks we shall have the pleasure of seeing the shower next year, and under much better conditions than those prevailing on the recent occasion. There will, of course, then be no moon to interfere with the apparent brilliancy of the display. Then, also, Mr. W. F. Denning writes to *Nature*: "There is every reason to suppose that, though the shower has managed to elude us this year, it must confront us next year, and possibly in 1901. . . . But many of us will hope to find compensation for the disappointments of recent years in observing a brilliant return of the meteors in one of the two ensuing years, and certainly before the denser region of the stream gets too far on its outward journey to aphelion."

**Purification of Acetylene.**—This question, which is of increasing importance, has occupied the attention of many investigators for some time past, and will naturally grow in importance as the use of the gas becomes more general. In a recent number of the *Engineer* an exhaustive article on the subject was given, and the merits of the various systems dealt with, the summing up of the results being as follows: We see that, by keeping the original acetylene free from too much moisture, removing the ammonia, treating it with chloride of lime, diluted, if necessary, with some inert inorganic substance, and making it afterwards pass through a vessel of soaked lime, more of the impurities in the crude gas are extracted than if the Frank or the Ullman process be adopted. The operation is said to be simpler for a non-chemical attendant; it is obviously far cheaper. The one disadvantage of the purified gas, its minute percentage of carbonic oxide, is too trivial to be considered.

**Electric Seeing.**—Some few months ago much interest was roused by the publication of an account stating that Mr. Steins had discovered a method by which, with the aid of electricity, blind persons could be made to see. Naturally such a plan had photographic interest from possibilities it foreshadowed in connexion with photography. But the bubble has been pricked by Mr. G. H. Robertson, who himself is blind, and who has communicated the results of his inquiries to the *Electrician*. Briefly, he made personal inquiries, and, notwithstanding several visits to Mr. Steins, no experimental proof in substantiation of the claims which were put forward on his behalf were obtained, and the conclusion arrived at is that these claims were without foundation.



## JOTTINGS.

THE prospects of British photography being worthily represented at the Paris Exposition do not look bright. By British photography I, of course, mean all branches of photographic production—not merely “pictorial” photography, which a very eminent figure in the photographic world recently declared to me to be relatively so unimportant, in comparison with other branches, that, if the “whole boiling of it” (his words, not mine) were swept away to-morrow, it “never would be missed.” Some of it would not, at any rate; and so far we are in agreement. But to the Exposition: the pictorial and technical works which Mr. Craigie and General Waterhouse are to send to Paris would about fill one of the small walls at the Pall Mall Gallery, so that, however carefully the selection is made, this display can scarcely be considered representative.

And, if British photography is to be inadequately represented at Paris, British photographic manufactures are likely to share the same fate. From an article in *Engineering*, which was probably written by that great Exhibition authority, Mr. James Dredge, it appears that British industries and science will only be represented by 642 exhibitors! Of that number it is obvious that very few indeed can be photographic manufacturers. The writer of the article is of opinion that “possibly this apparent indifference is partly due to the remarkable absence of information available about the Exhibition, and partly because of the unsatisfactory arrangement, from an exhibitor’s point of view, by which exhibits will be scattered over a large area, instead of being concentrated into a British section.” Other causes which need not be referred to here may have been at work; but, whatever is at the bottom of the matter, there is no escape from the fact. However, if British photography makes a poor show at Paris next year, we may confidently expect that nearer home, in 1901, it will make a brave and notable display. I am alluding to the Great International Exhibition at Glasgow, which takes place the year after next.

I notice that Mr. Bolas, in the course of a discussion on stripping films at the Royal Photographic Society a few weeks ago, contributed a useful note on the history of daylight changing. He said that for many years he considered himself the originator of the “daylight cartridge” system, which he described at a meeting of the South London Photographic Society in, he thought, the year 1886; but he (Mr. Bolas) found quite recently that in a number of *Notes and Queries*, issued in 1855, the system was described in very full detail by an Indian officer, Captain Barr. All honour to Mr. Bolas for having so publicly waived his claim to priority. It would be interesting to know if Captain Barr is still alive and a witness of the immense esteem in which the convenience of daylight changing is held by hundreds of thousands of photographers.

Ortol appears to be the reigning favourite amongst the new developers, if we may judge by the amount of attention it is receiving at societies and in the press. I remember submitting it to experimental trial on its first appearance and being much impressed with it, but after a couple of years one’s recollections of the characteristics of a new developing compound can hardly be expected to be very vivid, so I have forgotten ortol’s points. And as to the last word—points—my experience is that the points of resemblance between modern developers vastly outnumber the points of difference. Will anybody undertake to differentiate between, let us say, diphenal, diogen, and imogen? As to ortol, my object in penning this paragraph was to say that the most striking evidence of its value in certain classes of work was submitted to me a little while ago by Mr. Walter Everitt (no relation to Philip of that ilk).

Mr. Walter Everitt is a portrait photographer of surpassing ability, who has only to exhibit his work to be sure of making his mark. He showed me a series of clever studies, the subjects being ladies photographed in very soft, indirect, well-diffused light. The ladies’ dresses were of light silky materials (I’m no man milliner, so I can’t give a more precise description), but they were of delicate, shiny fabrics

which, in a soft light, would be full of the most subtle gradations Mr. Everitt first showed me a series of prints from pyro-developed negatives which excited my admiration; in fact, better renderings of flesh tones and gradation of light and shade I could not wish to see. However, when some duplicate prints from ortol-developed negatives were next produced, I was exceedingly surprised at the difference, the ortol prints betraying a purity and minuteness of gradation not visible in the pyro prints. I do not think I have seen more perfectly modelled and harmoniously lighted portraits than those I am referring to. Hence, possibly for the finer classes of portraiture, ortol may have properties worth the trouble of photographers to put to the test.

Rumour is very busy just now with all sorts of suggested “com-bines,” possible and impossible. I have heard it said that professional photographers are to be invited to unite for the purpose of getting better discounts off plates, papers, &c., than they are at present allowed. The chances of unity in this respect are, it may be supposed, rather slight, for the professional photographer seems to be like the Dunderbary bird which only “flocked” all by itself. And it is “all by” himself that the photographer appears to prefer to combine. If there is no combination or unity in defence of copy-right, the right to the negative, the suppression of price-cutting, and other vital things, you may safely conclude that increase of discounts will not prove the most inspiring and successful rallying cry. But, if the movement is started, it will be watched with interest and sympathy by many, no doubt.

Then, there is the other rumour as to an imminent amalgamation of some of the plate and paper-manufacturing houses. The man in the street has gone so far as to mention names. I shall be surprised, however, if the combination takes place. As I pointed out while writing on this subject a couple of months ago, the Continental manufacturers are only a few hours’ journey from the home market, and a limitation of the sources of English supply would inevitably be followed by a very keen foreign competition; while I am not sure that such a combination, if it was formed, would not also have the effect of unlocking British capital for the purpose of starting plate and paper factories here at home. Considering the number of fortunes that have been made in the business during the last few years, it is surprising that more Richmonds have not entered the field.

Even in the United States, the home of trusts and combines, the latest photographic combination, viz., that of the General Aristo Company, is not escaping opposition and competition. A friend, writing from the other side, tells me that, notwithstanding the “pull” enjoyed by the uncoated paper trust, two kinds of German baryta paper are being placed on the American market. If these papers answer the purposes of the sensitiser—which, of course, has to be seen—then the American trade in gelatine, collodion, and other papers will be once more split up. The old copy-book maxim used to tell us that competition is the soul of trade. Modern British trade is a very “soulful” thing indeed, for it never was so keenly competitive—or perhaps so prosperous.

As regards British photographic manufactures, it is doubtful whether the talked-of “combination” would be successful. Photography, after all, is a very small industry, and has not yet reached that stage when demand exceeds supply, so that the competition which such a combination would surely provoke might bring about a glut in the market, with its many attendant evils. A kind of Pattison’s whisky case over again.

As we are so near the festive season, this is a fitting opportunity to acknowledge a kindly invitation sent by the Editor of *Wilson’s Photographic Magazine* (New York), one of the most beautifully illustrated publications in the States. *Wilson* says: “The Editor of *THE BRITISH JOURNAL OF PHOTOGRAPHY* thinks that ‘American Conventioners’ ‘do themselves’ exceedingly well.’ But he is very



anxious to know more about that clam-bake. Words cannot describe it, but he will find a hearty welcome if he will come over next year and learn bliss by experience." The Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY asks me to very cordially thank his American *confrère* for his graceful compliment. I am also to add that next year the one insurmountable obstacle to his learning the bliss of clam-bakes at the American Convention is a prior engagement at the British Convention, Newcastle-on-Tyne, where he has no doubt various other kinds of bliss await him.

COSMOS.

### THE NASCENT SILVER AND SUB-HALOID THEORIES.

[Translated from the *Archiv für Wissenschaftliche Photographie*.]

UNDER the above title Herr G. Mercator has recently discussed, in a very comprehensive manner, the grounds upon which I base my preference for the view that the latent photographic image is formed of nascent silver rather than sub-haloid. Mercator comes to the conclusion that, in the absence of more cogent reasons, he must regard the sub-haloid theory as the more simple and safe, but he does not cite one single experimental fact which may be explained by one theory or the other exclusively. Whether one theory or the other be more simple and safe is evidently an affair of personal taste, and consequently not matter for scientific controversy. Were it not that he had incorrectly stated some of my arguments, and asked a series of questions to which I feel indebted to the nascent silver theory for reply, as against one-sided answers (*sit venia verbo*) in favour of the sub-haloid theory, I should not feel any inducement to reply to Herr Mercator. But I will also avail myself of the opportunity to balance one theory against the other by the light of a few fresh experiments.

As it is the duty of science to collect the whole of the facts within as few theories as possible, of two theories which account for a given phenomenon that must be taken as the better and more useful which explains the larger number of phenomena besides the one in question.

Of the two theories in question, the nascent silver theory is the more comprehensive, as it embraces the latent image and the processes of physical and chemical development, whilst the sub-haloid theory has not hitherto been used, or at most unsuccessfully, for the simultaneous explanation of development.

If, therefore, the nascent silver theory suffices to fully explain all that we know concerning the latent image, it should receive our assent in preference to the sub-haloid theory, unless it is thought that a theory should be absolutely true, rather than the shortest mode of expressing our experience. It is, consequently, the true scientific attitude to follow the nascent silver theory to its utmost consequences, since it is indispensable for the processes of development, and only there to relinquish it and seek a more satisfactory one where it fails to account for facts.

No facts could be brought forward, which were inconsistent with the nascent silver theory, when I recently stated my views for it in preference to the less useful, and therefore superfluous, sub-haloid theory. My reasons were not fully stated, but self-evident to the careful investigator. On the other hand, I cited the marked reduction of the latent photographic image by the action of nitric acid as inexplicable according to the sub-haloid theory.

In opposition to this, Eder has recently brought forward experiments showing that a weak yet developable image may be obtained by exposure upon collodion emulsion sensitised in a bath strongly acidified with nitric acid. According to my opinion, the diminution of capacity for development, as shown by this experiment, proves that at least some part of the substance of the latent image is dissolved by the acid, and may be metallic silver, rather than sub-haloid. We cannot infer from Eder's communication if the film with which the plate was coated contained sufficient acid to dissolve, under such circumstances, the whole of the silver which may have been formed by the action of light. Were this, however, the case, the experiment would also prove that some other part of the latent image is insoluble in nitric acid, and therefore not formed of metallic nascent silver, but very probably of sub-haloid, if the latter be insoluble in the acid solution referred to. This conclusion of Eder's, however, is confined to a portion of the latent image, and, when it is established that the quantity of acid used was sufficient to dissolve the metallic silver, I will acknowledge it, and concede that the nascent silver theory is insufficient to account for the latent image. But at present, as in the past, it suffices to account for ascertained facts, and, on the ground of economy of hypotheses, there is no adequate reason for acceptance of the sub-haloid theory. But, notwithstanding this funda-

mental principle, we cannot prevent the formation of hypotheses *ad hoc* to account for most of the new facts, in preference to trying to include them under the old theories.

In reply to "Mercator's" arguments, I wish to state that I did not assert that the existence of sub-haloid cannot be proved, but that it is *merely indicated*; also that sub-haloid *may* be, not *must* be, regarded as a mixture of normal haloid and metallic silver.

It is unnecessary to explain that silver, as well as sub-bromide of silver, may be converted to normal bromide by means of bromine. Herr Mercator has, however, to prove that a solution of potassium bromide can part with sufficient bromine to bromise a finished negative before he is entitled, under this tacit but incorrect assumption, to contrast the destruction of the traces of silver forming the latent image with the failure to bromise the whole of a finished negative.

It is quite easy to understand that other acids "which are not solvents of metallic silver" destroy the latent image formed by light. Herr Mercator means, of course, acids which have no marked microscopic action upon metallic silver; but the minute quantity of silver forming the latent image may be dissolved notwithstanding, for there is no such thing as absolute insolubility, according to fundamental physico-chemical laws.

I have already explained that a highly sensitive emulsion contains more nascent silver through ripening. Starting with this idea, I have since arrived at results which, though as yet qualitative, harmonise well with experience.

I may remark, in passing, that the nascent silver theory has thus acquired a certain amount of justification as a working hypothesis, whilst the sub-haloid theory can only show a very barren past.

Light adds nascent silver formed by exposure to that formed in the process of ripening, and the normal bromide supplies material during the process of development for the production of further nascent silver, which with the former constitutes the finished image. The action of bromide of potassium prior to development has already been explained. I do not find any difficulty in the way of the nascent silver theory giving these answers to Herr Mercator's questions; but, on account of our difference in taste, it is impossible to decide whether the sub-bromide answer given by Herr Mercator is more satisfactory and simple, with its "sub-salt of unknown and unstable composition," which "finally reaches a certain condition." I have a preference for the nascent silver reply, but its impartiality will not be readily acknowledged.

Herr Mercator throws out an important question in his explanation of solarisation.

According to him, the sub-haloid theory assumes that spontaneous oxidation occurs if there is a greater loss of bromine than is necessary to arrive at the stage of development. If anything is an hypothesis *ad hoc*, we have it here. To add to the hypothetical sub-bromide of variable composition another very hypothetical oxybromide, to which the highly improbable property of irreducibility by the developer is ascribed, this can have no scientific claim of value so long as the existence of such a substance is merely assumed for this particular purpose. This "explanation" is, however, rendered impossible by the fact that solarisation also takes place in the absence of oxygen, consequently where oxidation is precluded. Luggin's experiments have proved this conclusively.

Solarisation might be explained in the following manner by the nascent silver theory. Prolonged exposure to light reduces so much metallic silver that the particles of silver haloid from which it is derived become enclosed and protected from the action of the developer. A proof of this assumption might be obtained if a plate were exposed till solarised, then fixed and developed physically by Kogelmann's method. According to the nascent silver theory, a normal negative, not a solarised negative, should result. At present our supposition is favoured by the fact that all solarised negatives are veiled. Consequently development takes place all over the plate, which agrees with the deduction from the nascent silver theory that, in consequence of exposure, nascent silver is present over the whole film.

Mercator also doubts that metallic silver exerts any specific developing action, but this has been proved by me and by Herzog. The circumstances cited to the contrary, that other substances besides metallic silver induce development, does not dispose of the fact to a logical mind that nascent silver acts similarly. Moreover, it has often been shown that influences causing fog, such as pressure, contact with paper, certain gases, &c., are, without exception, those which bring about a reduction of silver from silver haloid, and therefore generate nascent silver.

That the transition of the sub-salt of the exposed and undeveloped plate to the metallic nascent silver of the finished negative should present difficulties to the mind of Herr Mercator is a matter for congratulation.



lation, for the nascent silver theory avoids this conception of transition. Concerning the opinion to which Mercator then gives expression, I can only endorse the query of the editor, for it seems to me a fact beyond discussion that an image formed of nascent silver may be strengthened by nascent silver already present in the film.

Mercator's explanation of Abney's experiment implies that the bromine of the normal bromide and the sub-bromide will attain an equilibrium by diffusion. This presupposes that unexposed silver haloid possesses a distinct partial tension of the halogen, which is contrary to all physico-chemical experience.

Abney's cyanine experiment may be explained by the nascent silver theory as easily as Mercator can explain it by the sub-bromide theory. The reducing action of exposed cyanine, which the latter assumes, is the cause which generates nascent silver from the silver haloid, and thus brings about capacity for development. This offers no apparent difficulty.

Mercator's conclusions concerning the grain of plates lack the proof of his premises, that more equal reduction should occur in the presence of a large than a small quantity of nascent silver. As opposed to this, I have endeavoured to thoroughly explain the connexion between the grain of the plate and development according to the nascent silver theory in my article on "The Theory of Photographic Development."

The fact that I only recognise a purely superficial difference between physical and chemical development seems extraordinary to Herr Mercator. Evidently this is from not being familiar with the experience that a free state must precede the deposition of a solid substance, and that deposition takes place from the solution where solid substance is already present. Ostwald was the first to draw attention to this analogy between the mechanism of development and the process of crystallisation, and Schaum has recently again explained it. In physical development the silver image grows outwardly, because the silver is added from outside to the nascent silver. In chemical development the image is an inward growth, because the film only contains silver. This is the only difference, which clearly is not essential in its nature. I willingly admit that the chemical development of a wet-collodion plate and the physical development of a gelatine dry plate are both possible according to the nascent silver theory, but I am not aware that they are practical impossibilities.

Mercator's conclusion is not permissible, that metallic silver is distinctly soluble in hyposulphite of soda, because prints lose considerably in the fixing bath. Unfixed prints are mostly formed of coloured organic silver compounds and organic colouring matter, produced by the action of light upon silver haloid mixed with organic substances. These are soluble in the fixing bath.

I tender these proofs in opposition to those of Mercator, and think they are preferable, because the conception is that of chemically and physically defined metallic silver, and not an ill-defined sub-salt.

R. ABBEG.

#### WINTER PRECAUTIONS.

We have now arrived at the second week in December, and it is not too soon to take a few timely precautions against the inconveniences often experienced by photographers in winter, particularly when we have a "real old-fashioned winter." One of the greatest inconveniences to photographers is a frozen water supply, and when that is experienced most can realise how easily it might have been avoided if they had only thought of it beforehand. A pipe soon freezes, but it sometimes takes a long time to thaw again, as witness the winter we had a few years back. Therefore, as a reminder, we should recommend all who have outside exposed pipes to lose no time in protecting them. A special felt is now sold by most ironmongers for the purpose. Two or three thicknesses of this wound round the pipes affords them protection, even in very severe weather. If the service pipe is laid near the surface of the ground, a few inches of good stable manure spread above will afford it ample protection. Up to the present we have had no indications of a severe winter, or, indeed, any winter at all, but with our uncertain climate no one can tell how soon one may set in. Even if the precautions alluded to prove not to have been required, they involve but little trouble, considering that they may be the means of saving. Hence the hint, and a reminder of the old aphorism, "A stitch in time," &c.

#### THE RELATION OF PHOTOGRAPHY TO ART.

[Transactions of the Edinburgh Photographic Society.]

THERE is a saying of the *Autocrat of the Breakfast Table*, the gist of which is that, for the purposes of conversation, it may be profitable, and it is necessary, to have a common understanding of the meaning of

terms. The confusion current in the use of terms relating to art does not make my task an easy one. A photograph is sometimes spoken of as a picture, and in the context may be rightly so denominated. Again, a picture is recognised as a work of fine art, and then there has arisen a fashion of talk of a decorated panel, so that in speaking of things the objects and purposes of them are lost sight of and obscured.

Whatever a photograph is as a final result, it is in the first place an impression thrown on a sensitised plate, and fixed by chemical means. Given that you have a perfectly flat object, such as a black-and-white picture or a bank-note, you may have a perfect reflection, perfectly fixed, but it is not the reproduction of such things that we are to discuss.

It is said that it is good to find out one's own limitations, and to direct our exertions within them. For that reason, if for no other, I would call your attention to the limitations of the photograph; but I do so quite as much because there is a very common understanding that a photograph gives an absolutely true impression, corresponding to the impression received by the eye, except in respect to colour.

A friend of mine told me the other day how he photographed sunsets. "That," said he, "is how we get moonlights." Thus this supposed absolutely true impression comes by the time it is printed to resemble a moonlight, and to be used as such. How this comes about I have no doubt all of you know who have any practical acquaintance with photography. You know that, as the afternoon runs into sunset, your plates become lower and lower in tone, and a longer and longer exposure is necessary in order to fix the form of things with any degree of fulness. All the time there is a certain unity of tone within the photograph, whether the form is clear or vague. This unity has no relationship with the appearance of things as the eye sees them, but is in accordance with the strength of certain rays which emanate from objects and act in accordance with laws of their own, so that at a given time of day, and by a limit of exposure, you may produce a picture that may pretend to be a view of the night. I use this illustration to show that the impression goes wrong in the fixing. The forms are in many respects true, but the general appearance is so altered that day has become night. There are other appearances—knowing the appearance intended to be reproduced—that are as strikingly at variance with the appearance as the eye sees it, notably groupings of foliage, which are never reproduced approximately to the appearance as the eye sees them. Now, this departure from a true appearance, which is striking and obvious in these instances, is present in all photographs. I have seen a photograph taken pretty late in the afternoon of a grey day which, by long exposure, realised, by the fulness of the modelling and discrimination of distances, the ideal of "plein air," so much sought after by a certain school of French artists of twenty years back, of whom the greatest was Bastien Le Page, whose work many of you may have seen in the recent Exhibition. But this photograph did not give anything of the character of the day on which it was taken, and this is notably the character of photographic work, the tones of which, however subtle, are not those tones related to natural appearance which enable us to distinguish between day and day. Looking to what I have said, I would therefore define a photograph as an imperfect impression gone wrong in the fixing. Finally, the difficulties of giving a perfectly natural appearance are not overcome even in a photographer's studio, however cunningly contrived, but come out in the undue force given to wrinkles and freckles. This undue force is well recognised, the reason being that, if you give an exposure sufficient to give a just appreciation of the part of the face in shadow, you will have over-exposed for the light.

If there is a departure from a truly natural appearance through the impression going wrong in the fixing, there is also a great and most subtle departure from the natural appearance of things through the peculiar perspective arising from the impression being thrown on the plate in the camera. Every one knows how out of proportion objects in the immediate foreground look. That is simple, but it does not end there. It is, indeed, the most obvious sign of a subtle distortion. I have seen most extensive views, say, of Campbelltown Bay and places like that, without objects in the immediate foreground to arrest the attention, which, knowing the places, have taken me by surprise. There, sure enough, are all details—the pier, the houses, the hedges—all right enough, but the general impression of the whole is of a place much more vast. Again, we have been made familiar with the apparently lordly palaces which many of the prominent literary and artistic workers inhabit, but this perspective of the camera has a trick of enlarging the contracted in rather a strange, and, I confess, in altogether a pleasing way. On the other hand, high places are sometimes brought low; thus ranges of hills in mid-distance are always very disappointing. Much more subtle is the distortion in a full-length figure occupying the larger portion of the photograph. I have noticed that the photograph is rarely used to show the fashion in the garments of women, and I do not wonder, for, unlike the view of Campbelltown Bay, which idealises, the full-length view of our lady friend rarely gives us the elegance we know she has. A review of the theatrical personages shown so largely in *Black and White* and the *Sketch* cannot, I think, fail to bring home the truth of this.

I bring these things before you, not in any wise to belittle photography, but because, as I said, of prevailing ideas attributing absolute truth to the photograph—and partly and more particularly as bearing upon our subject to inquire into the limitations of photography—for it is this



power imperfectly to fix an imperfect impression that you have to handle and apply to art or other purposes. Whatever the imperfections may be, it is a great power, because of its accuracy within limits and its ease of production, thus reaching millions, and giving information to millions, on all sorts of subjects, who would otherwise be uninformed.

As to the relation of photography to art, I have alluded to the confusion of terms relating to art, and have thought that if I gave you the idea of the purpose of art as expressed by one of the greatest artists, and some ideals as expressed in a word or two by others, we might get more readily to the heart of things than by a disquisition on terms that would necessarily be long. "By art alone," says Hokusai, a great Japanese artist, of whom Whistler speaks in the highest praise, "can we perpetuate and transmit to our descendants, and to our brother removed from us by a thousand leagues, all the joy and beauty we see filling the universe, the things of heaven and of Buddha, the life of men and women, of birds and beasts, ay, of trees and herbs." Again, I remember hearing Paul Chalmers, in presence of what to him was the exquisite beauty of nature, express the desire to have the power, not to paint it, but to be able to blow it on to his canvas. No more was said; I had understood him. I knew everything was passing so quickly, the very emotion was passing even as the incident that raised it; and the knowledge of this, and the sense of the perfection of things as they appeared in all their manifold unities, made him use the expression that he would like, by a breath, to have thrown the impression upon the canvas.

I have chosen this idea of the purposes of art as expressed by Hokusai, and this aspiration of Chalmers, as being such that the photographer might most readily lay hold of and associate his work with. Observe the all-embracing nature of the outlook of Hokusai—not merely the things of heaven and of Buddha, but "the life of men and women, of birds and beasts, ay, of trees and herbs." Surely the photograph should be able to tell us of some of these things as nothing else can. In a book by Rudyard Kipling, called *The Light that Failed*, he outlines, with singular ability, a man notable as an art student, the crack student of his year, who comes to nothing, never having what he calls conviction. Taught to paint, and with power matured, this man finds nothing to do. To him the world was not filled with joy and beauty, and no burden was laid upon him to perpetuate it. Without this "conviction" the photographer will, as an artist in photography, fail, even as this trained painter failed. If I am understood, you will see that I consider the most important thing in art is the motive. On the method I may have my opinion, and I preserve the right in common with everybody to judge of work accomplished, whether it is what it pretends to be, but the vehicle of the thought or the method is in the hands of the individual, and should it appear to any one that the photograph is the most fit instrument to articulate his emotion, that nothing else will accomplish his purpose so well, I wish him God-speed. I say articulate his emotion. Art is always emotional; in taste, its most elementary form, what is it but an emotion, a sense of rightness arrived at through feeling? Reconsider the words of Hokusai—it is no scientific knowledge of things that he desires to preserve, but the joy and beauty of them. It is no mere record of person or place that is at the basis of art work, but, at the very least, an appreciation of ideals and harmonies.

In the early days of photography certain work of a notable character was produced by D. O. Hill. Recently there has been some talk of a collection and republication of it, which I hope will be gone on with. It is the work of a man obviously trained in and with a knowledge of the best traditions of art, with great original power of conception. On the old lines of pictorial construction, one finds in these photographs beautiful arrangements of masses of light and shadow, constituting designs of a large and significant order; and, though you may single out one which you may prefer, this character runs through them. In the face of such work, one must acknowledge that the photograph may be made a vehicle for art expression of no mean order.

"Art is long and life is short" is one of the oldest sayings, and I do not think that the photograph really shortens the way of art. Suppose you form any ideal, if that ideal is a worthy one, you will make many attempts, and then it will not be realised, but a sort of approximation will be arrived at, and, with all sorts of regrets, you will give it to the public. If it be an art ideal, concerning the life of men or women, of birds or beasts, of trees or herbs, of groupings of light and shadow, then all past art will have some lesson to you as to how you will place or arrange your thoughts. The method, as in the operation of the photograph or the particular handling of the brush, becomes relatively a detail.

Although we have been considering the photograph as a possible medium for the production of original art work, that such is its primary or general application I do not concede. The general use made of photography, which is, also, I think, the most natural, is to show persons or things, not to express sentiment about them. For the purposes of knowledge, this power of fixing an impression even imperfectly of objects changing every moment is invaluable. Within our own time it has revolutionised our ideas of the action of animals. Through photography we now know absolutely the position the limbs of animals have in relation to each other in the process of a movement, birds as

well as beasts. Since this revelation artists have modified more or less their conventions expressing the movements of animals.

It must be remembered, however, that each individual photograph does not show motion, but arrested motion. What is done in art, where it is successful, is to express more or less by a convention the idea of motion. The rudest convention, portraying, say, a whirl of drapery or a falling wave, is infinitely truer, and, because truer, more beautiful, than a photograph of the same with its portrayal of arrested action. I have spoken of the tones of the photograph as not being true to the tones of nature as seen by the eye, being the product of the action of certain rays that act in accordance with laws of their own, and I would be sorry to see ideals founded upon such a false basis dominate us in our notions of truth. It has been said that the delineations of features as given by Reynolds and Raeburn are beautiful generalised conventions, and they have been opposed to the work of more recent painters as being less true, if more beautiful. I do not think so, but rather do I think that they are more beautiful because they are more like nature, and less like photographs, than the work of these more recent men. I think the truest aims of art have ever been, in all conditions of knowledge, to express the joy and beauty of the world around us, and the attainment of these ends never requires the sacrifice of truth.

I have referred to the influence on art of the knowledge of the movement of animals imparted by the photograph, but there is a movement in almost everything that has life—movement embarrassing to the student, movement in clouds, movement in the growth of herbage, changes so rapid that, before you can record the present appearance, the appearance is gone, so that this power of fixing even imperfectly the imperfect impression of a passing appearance is an enormous help for the purposes of knowledge. And, beyond this, there is also to be remembered that the faculty of delineating appearances is not bestowed upon every one, so that this photographic eye that takes with it the power to make a permanent image—which any one with a few shillings to spare may have—is not to be despised, even although it may be an imperfect one, for by this new eye the number of trained observers may be enormously increased. There have from time to time appeared photographs of birds' nests taken in almost inaccessible places. Few things in photography are, I think, more beautiful. Besides the interest of them, they have also something of the relation to art that the direct artless tale has to imaginative literature; but it is the pursuit of knowledge, not the appreciation of the beautiful, that is their *raison-d'être*. This pursuit of definite knowledge, which has such a happy result in the instance I have mentioned, might, I think, more frequently be followed, and would, I think, take the place of what Kipling calls conviction in art proper. It is not in this or that, but anything almost might be your subject. Say to relate the form of clouds one to another; the form of clouds when the wind is blowing from the east; and the different form they take when the wind comes off the west, or in a gale, noting the rate the gale is blowing at. Like the chemical experiments in crystals, I think you would find that the most beautiful forms would be evolved. This would certainly require patience, and something more, but the results would be an added interest to the work of photography.

There is a kind of art called archaic. That name is applied to the work produced when the laws of perspective were unknown—when the laws of chiaroscuro were unknown. The laws relating to these things were not unfolded all at once. If you go back far enough, you find art wholly archaic, but coming down from such a period you find degrees of archaicism. This lessening archaicism, due to increase of knowledge, is sometimes mistaken for art progress, but that it is rightly so called I greatly question. It appears to me that the artist works in the atmosphere of contemporary knowledge of fact. I am told that at this moment there is an utter breaking up of the traditions and conventions of art in the East. Various reasons are given for this breaking up, and probably there are various causes in operation; but among all the possible reasons the major one will remain, that you cannot take the knowledge or the science of the West to the East without this knowledge reacting on the art of the country which receives the enlightenment. It may be, therefore, that the enlarged knowledge of the facts of appearances due to the photograph will react upon pictorial art, but this added scientific knowledge will not make the picture more artistic, that must depend on the power and emotion of the artist alone.

Great inventions have been called great gifts to humanity, and I think the photograph may well be called a great gift. At the same time, like many another gift, it is not without its dangers. I remember hearing a remark by an artist who occupies still, and has occupied for a long time, a foremost place as a draughtsman. He said that, when he saw younger men coming forward, he sometimes feared for his position; but, as he saw one after another making use of the photograph to copy its forms, his fears vanished, for, as draughtsmen, he found that, from the moment they began making this use of the photograph, they ceased to develop as draughtsmen. The reason of that, I think, is simple enough. A faculty will just maintain itself and develop by the legitimate use of it, and a draughtsman, copying from a photograph as an easier way, releases the strain of his endeavour, and, in doing so, loses his power. Such a use of the photograph is a danger to the artist. And I think that the common understanding, to which I referred in the beginning of my paper, that the photograph gives a true impression corresponding to the



impression received by the eye, except in respect to colour, is having evil effects on certain ideals of art; and for this reason, while accepting photography as a great gift, I would ask for the keenest scrutiny into its limitations.

J. LAWTON WINGATE, R.S.A.

### CINEMATOGRAPHY AND THE PRIZE RING.

THE well-known authority on sport, Mr. Martin R. Cobbett, has the following remarks, in the *Referee*, on some curious aspects of the association between animated photography and the American prize ring. "We are promised that a moving picture report of the Jeffries-Sharkey glove fight shall be shortly on view in this country. From what the only genuine electric photography firm say about the opposition, who endeavoured to poach pictures of the two boxers in action, Mr. Dion Bouicault was slightly in error in putting the camera at the same weight as George Washington as a truth-teller. Trade jealousy is responsible for the statement that the instrument can lie, and on that account the public, possible customers for the only veracious, genuine article, have been given notice to see that they get the proprietary article when they ask for it, and not to be imposed upon by more or less colourable imitations. I do not know what the label is, but, according to the firm who are to run the right show, the wrong sort would be very inferior, being to a great extent built of fake. I shall be glad to see what the veroscope, or whatever the arrangement may be in this instance, says about the performance. It ought to hit off the doings of the boxers and give other particulars in if its use is to be justified, for, according to some reports, the men chiefly concerned went through a parlous lot for what they hoped might be a good deal in the way of show money. The lighting arrangements necessary to enable the instantaneous photographs to be taken reliably were responsible for tremendous heat, and both Jeffries and Sharkey suffered considerably through having what appears to have been an enormous grille of electric light right over their heads while they were hard at work. . . .

"This being thus suggests the question as to whether the exigencies of instantaneous photography and the value of royalties on the perfected pictures had much to do with letting things last as long as one of the boxers or both allowed them to rip. By all accounts it really was a tremendously hard battle—so hard, with big, heavy men hitting in earnest, that its going the whole twenty-five rounds is most remarkable. That it ought to have been stopped earlier is quite evident on the testimony of the person supposed to be the best judge of such matters—at least, so one must believe until evidence to the contrary is produced by the cinematograph or one of those remarkable illustrators. By the way, would it not be as well if, for a process such as a glove fight, divided by arrangement into set periods for action and armistice, the picture machine could be timed to run with the referee's or the official clock? One does not gain quite the correct impression from the views given so far—at least, one does not if the clock by appointment can be depended on. It seems sometimes as if the mutoscopic system went only from act to act—that is to say, action—and took no notice of the waits between. However, we shall see what we shall see when the time comes to bring the show over here."

### PHOTOGRAPHY AT ETON COLLEGE.

PROBABLY it is not generally known that the celebrated College at Eton has a photographic society which is ten years old. The Annual Exhibition was held last week, and the President, Mr. T. C. Porter, has been good enough to send us a copy of the catalogue. This is a well-produced book of thirty-eight pages, supplemented by twelve pages of half-tone reproductions of the exhibits, some of which, if we may judge by the process prints, are of a very high order of merit indeed. The photographs are described with great detail in the catalogue, and notes of the processes used are appended. Our readers, we are sure, will be interested in the following short account of the Eton College Photographic Society. It is extracted from the catalogue:—

The Society was founded (by the present President) in the year 1890, in which year it held its first public Exhibition in the room in the Queen's Schools, until recently used as a physical laboratory, and in the same room, and the adjoining lecture-room, was given the second Exhibition in 1892. The next year, owing to the increasing number of views exhibited, the Exhibition was held in the Upper School, and has so been held every year since that time, except in 1894, when the floods caused it to be postponed till the Lent Half, 1895, so that the present Exhibition is the tenth. Besides the photographic prints and enlargements exhibited in Upper School on occasions like the present, the members of the Society contribute lantern slides both for the Annual Lantern Evening, and from time to time read papers on photographic subjects, demonstrate photographic processes, and give accounts of their wanderings, illustrated by transparencies of their own making. They possess a very fair dark room, which is reserved exclusively for their use, and take in some photographic journal, which is kept in the School Library. Every member is bound to do a certain amount of work for the Society, and failure to comply with the rules in this respect is held equivalent to resignation; nor is any ex-member eligible for readmission. Entrance

to the Society is secured by the merit of photographic work, done solely by the candidate, and submitted by him for the President's inspection. This work must be free from certain photographic faults specified in the rules of the Society (an extract from these rules will be found appended to this account), and, provided the work is so far satisfactory, the President is bound to admit the candidate. The difficulty thus placed before those anxious to join undoubtedly tends to keep the number of members small, but this disadvantage is found to be more than compensated by the genuine and lasting interest felt in the subject by those who have taken sufficient pains to be successful; and, moreover, the fact that any one is a member of the Society is a sufficient guarantee that he has attained some proficiency in photographic methods.

As a rule, the Society numbers about a dozen present Etonians, with at present fifty old Etonian members, a few of whom generally send work to the Annual Exhibition, though, unlike present Etonian members, they are not bound to do so; they are, moreover, exempt from any subscription, which, in the case of all other members, comes to about fifteen shillings a year.

It is a rule of the Society that, at any public Exhibitions, each member may exhibit his own work only. When any of the work so exhibited seems to attract special attention, the exhibitor is invited to furnish a copy, which is forthwith mounted in a special book, and kept in the School Library for general inspection.

### EXTRACT FROM THE RULES OF THE E.C.P.S. RELATING TO ADMISSION TO THE SOCIETY.

14. The entrance work to qualify a candidate for admission to consist of not less than three finished prints on any ordinary printing-out paper—bromide, platinotype, &c.—at least quarter-plate size, and each candidate must declare the same to be entirely his own work.

15. That none be admitted on work done with a hand camera only, though two of the three views may be so taken.

16. That no piece of entrance work shall be accepted by the President unless free from the following faults:—

- (1) Spots both light and dark.
- (2) Lines due to scratches on negatives, hairs, dust, &c.
- (3) Bad focussing.
- (4) Bad colour.
- (5) Distortion—such as that which causes lines really perpendicular to appear slanting.
- (6) Great harshness in the print.
- (7) Red marks on the shadows in the print.
- (8) Fading of the print. With regard to this fault the candidate may be required to state the number of hours' washing the print has received.
- (9) Marks caused by the negative frilling or blistering.
- (10) The result of strong fog on the negative.
- (11) Great flatness in the print.
- (12) An ugly subject—if void of some distinct interest—historical or otherwise.
- (13) Pictures of a private nature—portraits, &c., may be rejected at the discretion of the President.
- (14) A mottled appearance of print.
- (15) Halation.

17. That, if the entrance work be approved, it be presented to an Entrance Work Book belonging to the Society, wherein it be duly mounted, and the particulars of the said work to be entered in a book specially kept for that purpose.

### A NEW SANDELL FILM.

MR. J. T. SANDELL, in his patent specification, gives the following description of a new rollable gelatine film which he has worked out: This film dispenses with all extraneous support for the sensitised emulsion, and is a film wholly of gelatine emulsion suitably hardened to render it self-supporting, and to adapt it for use as a continuous film in the roll-holder or cinematograph.

The film, Mr. Sandell states, is produced by coating a suitable surface by means of the well-known apparatus employed in the manufacture of dry plates, either with a single coating of emulsion of a thickness sufficient to afford the necessary tensile strength, or with two, three, or more superposed coatings of graduated degrees of sensitiveness, the coating (whether single or multiple) being afterwards stripped from the surface on which it is applied, and used without any adventitious support. The surface upon which the coating, or coatings, of emulsion is, or are, thus applied, is preferably that of a sheet or strip of glass, perfectly flat and highly polished; and, in order that the film may possess the hardness necessary to render it self-supporting, a hardening agent, such as an alum or formic aldehyde, is incorporated in sufficient quantity with the emulsion.

The proportion of the hardening agent will depend upon the initial state of hardness of the gelatine used in the composition of the emulsion, this hardness varying within somewhat wide limits in the case of different parcels of gelatine as supplied by manufacturers of that article. Generally speaking, however, about one and a half per cent. by weight of



chrome alum relatively to the weight of gelatine used in the emulsion will suffice.

The use of a hardening agent, as described, is of importance as tending to facilitate the manufacture of the films by accelerating the setting and drying of the emulsion, whether the films be formed of one or of several superposed coatings, it being, of course, necessary, in the latter case, to allow one coating to become thoroughly dry before a further coating is applied.

### AN AMERICAN PROFESSIONAL'S IDEAS ON RETOUCHING.

[Presidential Address to the Kansas Convention of Photographers.]

PROBABLY there is no subject pertaining to photography that has been discussed more than the subject of retouching, unless it would be the subject of developers, of which there seems to be no end. By retouching is meant to improve by new touches of the artist's hand to a work which has been considered finished before; therefore, to be a good retoucher, one should be a very clever artist, not necessarily a Raphael or a Borguereau, but he should be able to make a clever drawing of almost anything placed before him. He should possess a pair of good eyes and an overstock of patience, for success depends upon knowing how to be patient, how to unmake or remake, how to recommence and continue, without allowing the tide of anger or the flight of the imagination to arrest or divert the daily effort.

The necessary tools for the retoucher need not be many or expensive. A good stand, a few Faber or Hardmuth pencils (No. 2 to No. 6 H), a good retouching medium tempered with turpentine to furnish the proper tooth for these pencils, a bottle of Hance's ground-glass substitute, a bottle of alcohol, a few soft pine sticks, some clean rags, a good, sharp-pointed penknife, some India ink, some Chinese white, and some fine sand paper to sharpen pencils. Nearly every retoucher has a pet medium he likes best; but, for my part, I would prefer a mixture of Canada balsam of fir, resin, and chloroform, tempered with turpentine to suit your fancy. With this outfit you can meet all the requirements of the retoucher. If you have an air brush, so much the better, but it is not absolutely necessary.

In retouching a negative it is best to look it over carefully, and see if the contrast is too great or too weak from faulty development. If too strong, make a weak solution of hypo and red prussiate of potassium, and with a camel's-hair brush spread this solution all over that dense portion, which prints up like a snow bank, until the detail which was lost comes back again; but don't go to the extreme and take out all the life pluck. If the negative is too weak, it may be strengthened, as you all know, with a solution of mercury and bromide of potassium, or any portion of the negative may be built up by spreading this solution with a camel's-hair brush over that portion, until it has gained the required density, then darken the film with a solution of sulphite of soda, then rinse well with water. After the negative becomes dry it is a good plan to proof it, as you can tell better how to judge it for further treatment. After studying the proof carefully, and you find there is too much catch-light in the eyes, or warts and moles on the face, they may be reduced by a gentle scraping with the sharp blade of your penknife, or, better still, by taking one of your soft pine sticks and sharpening it to a fine point at one end and a rather blunt point at the other, then stretch a soft rag over the index finger of the left hand, moistened with alcohol, and hold it on the spot to be reduced, then take the pointed stick, also moistened in alcohol, in the right hand, and gently rub away the high light; then, with the alcohol rag, rub off the loosened gelatine until it looks clean and clear. There is no end to the amount of delicate reducing that can be done in this way.

Next in order is to fill up the hollows and build up the high lights with India ink. Take Higgins' liquid ink, reduced with soft water to the required shade, and mix in a touch of Antwerp blue to match the colour of the negative. With this build up the desired parts with faint and fairy-like touches, having ready in the left hand a piece of lintless blotting-paper to catch the accidental drop or blot of ink after each stroke of the brush. I use the best and highest-priced artist's flat red sable water-colour brushes I can find, capable of making a broad, smooth stroke, at the same time springing back to a point as fine as a needle. There is no end to the amount of ink work that can be done on a negative after a person gets into the practice of working on the gelatine surface, and the better the artist the more artistic the work, as a matter of course. After the negative has been brought forward thus far, it may be further prepared by rubbing on the retouching medium. I stretch a soft rag over the ball of the index finger, place it over the mouth of the bottle containing the medium until saturated, then rub it all over the negative as smooth and evenly as possible. Some only put the medium on the face and other parts to be pencilled; in this case the edge must be blended out, or else the negative varnished after the retouching is completed; if this precaution is not taken, the negative, being more translucent, will print a dark patchy place all around the head on the background of the finished print. In commencing to retouch a plate, I think it is best to start in the upper left hand corner and gradually work downward, and to the right over the entire face, taking out all freckles and blotches; afterwards build up the negative and soften down the wrinkles by a series of hatching, cross-hatching, and stippling, put on

in such a manner that the finished negative has a grain or stippled effect. In working out wrinkles and freckles, always work the pencil lightly in the transparent places, being careful not to touch the outside, or you will have extra trouble, and may have to wash all your pencil work off with turpentine and start over again. Another way of working is a sort of swaggering or dragging movement of the pencil in every conceivable direction, until a hollow cheek is filled, a shadow reduced, and a wrinkle softened, in fact the whole face is modelled and built up by this random wiggling movement of the pencil, until the face has a beautiful, even, soft, stippled effect, something like a fine miniature painting. I prefer this last style of retouching to the former, as the finished photos do not have the appearance of being retouched with a nail; I am speaking of the cabinets and smaller-sized photos; of course, in larger sizes you can be more broad in your handling, with good effect. Once in a while you will run on to a negative where the freckles are so deep and sharp that they seem to be out clean down through the film to the glass; they look like the operator had focussed his instrument to microscopic sharpness and blown bran in the face at the time of the exposure. Some customers have such bad freckles they would make a turkey egg ashamed of itself; in such cases the operator can help out matters wonderfully by turning the instrument a little out of focus, just enough to take off the wire edge and give full exposure. In retouching these tough cases, I prefer a 2 or 3H lead; if you do not get the most obstinate of these pits grubbed out, give them a rest until you model the face as beautiful as possible, not to lose the likeness; then go back to those deep freckles, blow your breath on them, and they will collect enough moisture to take a 2H. lead nicely. Just peek the pencil right in the freckle very cautiously lest you break through the film, in which case your only resort would be a fine p-pointed brush and India ink. After this breathing and stippling process, give the negative a coat of Hammer's retouching varnish and go after them again. By this time you will find them so completely flaxed out that you would have to take a microscope to find them. If you ever want to see what a good retoucher you are, just make a bromide print from one of your negatives, and I hardly think you will need a chain of argument to convince you. Once in a while you will have a negative that has a fine position, beautifully lighted, in fact everything heart could wish, with the exception of being flat—by not pushing the development long enough to give strength and pluck to the high lights of white drapery. In this case, after retouching the negative carefully, blow the back of it with Hance's ground-glass substitute, and carefully work on this with a fine red sable brush, moderately filled with a weak solution of Chinese white, and for broader effect use the air brush and Chinese white; for sharp, crisp, high lights use the white as thick as can be worked with a red sable, and be sure to place each touch of the brush exactly on the high light, which can easily be done when the negative is in the retouching frame. In printing from this negative it is a good plan to drive a small brad in one edge of the printing frame, and so place it to the sun that the brad casts no shadow in any direction. This will bring all your brush strokes and touches squarely between the high lights of your negative and the sun. If this precaution is not taken, your brush marks will cast a shadow to one side on account of the thickness of the glass and give a blotchy or patchy appearance to the prints. Another method is to use thin, fine linen paper on the back of the negative and work up the high lights with pencil and stump, but I prefer the ground glass and Chinese white, and then bind a clear glass on top of that in the manner of a lantern slide to protect it from getting marred and scratched. This may not be called legitimate photography, but, whatever faking is resorted to on the negative is legitimate if the effect of the finished picture is heightened thereby, and I hardly think there is any one who would not forgive the sin after viewing the beautiful result thus obtained.

Now, as we have gone over the mechanical operation, allow me to caution you not to retouch too much, for it is just as bad, if not worse, to overdo than not to do at all. Be careful not to give the face a puffed or blown-up expression, especially to people with round, full faces. If you have a hatchet-faced subject, you will never hear them complain if you puff them up considerably, and it is just as necessary to please in selling a dozen photos as it is in selling a pair of shoes. It is a matter of business. However, in working the negative of a celebrated person in any sphere of life, you should first get a good likeness and a rich chemical effect, then retouch as little as possible, only to modify their glaring defects, for you are then handling public property, and the public demands facts and not your ideals on subjects.

We will now examine the different parts of the face that require special attention. This drawing of the skull will present to you a view of the main foundation of all human expression. Upon this foundation is fastened all the muscles that play such an important part in telling whether we are glad or whether we are mad, joyful or sorrowful, filled with pleasure or filled with pain. It is not necessary for the retoucher to know all the muscles like a doctor, yet it will not be any disadvantage to him if he will study a few that play such important parts in the expression, such as the occipito frontals, the orbicularis palpebrarum and the orbicularis oris. Very often a customer remarks, "Ye, I like the proof very much, but it has such a cross look, such a sad look, or just as though I had a tooth pulled." The retoucher, by understanding the action of these muscles, can change the expression from a sad look to one of



pleasure, or one looking too pleasant can be reduced to soberness. Probably the orbicular muscle of the mouth, and the corrigator supercilli concerns the retoucher most, but it is impossible for the average man to work around the orbicular muscles of the eye without losing the likeness, until he becomes an expert. Even then, he has to work extremely cautious, consequently it is best to work around the eyes as little as possible. Sometimes a subject naturally has a cross look, almost verging to madness, especially in the adult, as the cares of life have stamped their ineradicable marks upon the face; they look like a mad cat; the eyebrows are knit, and the mouth runs down at the corners. In such cases the deep wrinkles between the eyes should be softened, the shadows at the corners of the mouth turned upward, and thick lips slightly reduced. But, of all the jobs that make a retoucher curse, it is a lady with low-neck dress, that has a neck as skinny and bony as a mud turtle, and expects you to retouch it as plump as a butter ball. This drawing will give you some idea of such a task; but don't get discouraged, don't falter, don't wish that you were dead. Keep the shadows of your anger and imperfections behind you. Put as much thought into the picture as possible, and remember that every real thought on every real subject knocks the wind out of somebody or other. As to the retouching of landscapes, there is as much or more latitude than in portraiture, but the best plan is to make nature do the work as far as possible. Make your negatives early in the morning, when the chickens begin to hunt their food, when the air is full of perfume, and the bee is gathering sweet from the flowers, or in the evening, when the weary farmer plods on his homeward way, when the lengthening shadows cross the golden fields and the blushing sun lies far in the west.

R. B. HANSFORD.

#### SCREENS FOR ORTHOCHROMATIC PHOTOGRAPHY.

MR. R. W. ARTLETT, according to his patent specification, proposes to employ two discs of glass (figs. 1 and 2), which preferably have plane surfaces, but which may ground to a slight curvature. Each of these is coated on one side with a film of gelatine, collodion, or other suitable material, and each film is then dyed, the one (fig. 1) a strong bright yellow, and the other (fig. 2) a clear strong red. The yellow-dyed film



permits the red, yellow, and green rays to pass, and intercepts the whole, or nearly the whole, of the blue rays, whilst the red-dyed film operates to intercept the violet, indigo, blue, and green rays. In the centre of the yellow film there is a small circular vacant space, *a*, and in the centre of the red film there is a comparatively large circular vacant space, *b*. The two discs are now cemented together, film to film (fig. 3), with Canada balsam or other cement having a refractive power corresponding as nearly as may be with that of the gelatine or collodion film.

Mr. Artlett states that a coloured screen prepared in the manner above described transmits a small quantity of the very energetic blue and violet rays (along with the other rays constituting white light) through the central space left vacant in both films, a large quantity of the green rays (with red and yellow) through the yellow annular space which intervenes between the central clear space, *a*, and the red film, and a much larger quantity of the comparatively inactive orange and red rays through the outer or red-cum-yellow portion of the compound screen.

By adjusting the proportions between the central or clear portion, the outer or red-cum-yellow portion, and the intervening yellow portions of the screen, the quality of the light admitted may be regulated so as to obtain the most perfect results, and, although it is desirable to have a small central vacant space in the yellow-dyed film, it may sometimes happen that the circumstances will admit of the use of the film intact.

The screen is placed in the lens in a position as near as may be to the diaphragm.

#### THE REDHILL AND DISTRICT CAMERA CLUB'S CONVERSAZIONE.

THIS rising Club, which owes its inception to an influential body of very ardent photographers, celebrated its first anniversary at the Market Hall, Redhill, on Friday, November 24, by a most enjoyable *Conversazione*. The company that attended was a select one, and was notable for a goodly sprinkling of ladies, who have more or less become initiated into the art of photography. The reception took place in the small assembly room, where the *Conversazione* was held. Among those who were specially invited were the Mayor of Reigate (Mr. F. E. Barnes, J.P., C.C.) and the Mayoress, Mr. William Conolly (Chairman of the Redhill Technical Institute) and Mrs. Conolly, Mr. and Mrs. P. N. Hasluck, Mr. W. H. Rogers (Secretary of the Camera Club, Croydon), and Mr. Pierce (Secretary of the Photographic Section of the Natural History Society, Croydon), and many other ladies and gentlemen.

A local contemporary says that the Exhibition, though not an extensive one, was, in point of merit, one of the best, if not the very best, of the collections of high-class photographs which have been seen in this part of Surrey. As this is the best Exhibition which the Club has organized, still more meritorious displays may be expected in the future. In its first year of existence the Club could hardly be expected to give prizes; certificates therefore were awarded instead. The winners of the certificates were Dr. Dutton, Mrs. Arthur Thompson, Mr. T. Percivale Padwick, Miss K. D. Flemming, Mr. J. O. Grant, and Miss Mabel Pelly. The somewhat difficult task of judging the exhibits was performed by Mr. Ralph W. Robinson, the well-known photographic artist.

The Exhibition was chiefly remarkable for the simple charms of the subjects selected and the rich shading of some of the land and seascapes. The cloud and sunshine effects, too, were highly artistic. A number of non-competitive pictures were sandwiched in with the lesser lights. One of these was an enlarged negative of a fire which took place at Messrs. T. S. Marriage & Co.'s, at Reigate. Mr. Ralph Robinson, as Vice-President of the Club, exhibited amongst other pictures a beautiful photo of the head of a child (draped). *Bringing Home the May*, 1863 (medal), and *Carolling* (medal), were among a rich collection lent by Mr. H. P. Robinson, Tunbridge Wells. A masterpiece of detail and skill, as well as an example of perfect finish, was a panorama photo lent by Mr. Henry Speyer (Alpine and Camera Clubs). This was a combination photograph of the vast panorama that meets the eye from the Gross Viescherhorn, a mountain, 13,281 ft. high, in the Oberland Alps.

The latter part of the evening was taken up by an interesting lantern exhibition by Mr. Wm. Brooks. The exhibition consisted of four series of photographic slides, most of which were taken by members of the Club. The first series included a number of "up the river" illustrations, taken by Mr. Arthur Dunning, who gave a few explanatory words to each slide. The other two series represented the work of Messrs. J. O. Grant and F. Martin Duncan. The last series was the work of the operator of the lantern, Mr. Brooks, who showed a great number of interesting pictures which he had taken during his rambles in various parts of England, principally in Devon and Cornwall. A few photos of the wrecks of the *Mohegan* and the *City of Paris* on the Manacles, were also included.

#### CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB'S ANNUAL SOIREE.

THE Annual *soirée* of the Croydon Microscopical and Natural History Club was held on Wednesday, November 29, at the Public Hall, Croydon. A local contemporary states that the large hall was devoted to exhibits of microscopes and microscopical objects, photographic and other scientific apparatus, and zoological and ornithological specimens. In the small hall and corridor were photographs and transparencies, while the botanical, entomological, ethnological, and art collections were on view. The Röntgen ray apparatus occupied a room to itself, and the Old School of Art room was devoted to demonstrations with the lantern.

The exhibitions of lantern slides were excellent, Mr. W. Brooks, of



Reigate, showing a beautiful series of photographs, among them being a number of views of the *Paris* on the Manacles, and of the *Mohegan*, which was also wrecked at the same place. A number of slides by members of the Club were also shown.

The demonstration given by Mr. W. Saville-Kent, F.L.S., F.Z.S., of trichromatic photography, was full of instruction. Mr. Kent has devoted considerable attention within the past year to the subject of trichromatic or three-colour photography, as applied to the correct colour registration of zoological and botanical subjects. With the aid of the lantern, he exhibited on the screen, as also in special frames in the public hall, lantern slides and larger transparencies of a series of examples upon which he had most successfully experimented.

Among the slides displayed, that of a peacock's feather, in which the characteristic tints were reproduced with marked fidelity, was particularly noteworthy as a successful demonstration of the capabilities of the system adopted. Orchids and various strikingly coloured flowers, gold and silver carp and other fishes, lizards, and birds in many varieties were included in the series submitted.

Among the fishes, an example of a John Dory in the act of engulphing a smaller fish in its peculiarly distensible jaws, presented a most realistic aspect. This, with other fish subjects, had been taken by Mr. Saville-Kent during the past summer at the Plymouth Marine Zoological Station.

In the bird series, a little group of Australian gouldian finches, *Poephila Gouldii* and *Mirabilis*, remarkable for the almost parrot-like brilliancy of their plumage, attracted much attention. In addition to the coloured photograph of a little group of these birds that had been artistically set up for the exhibitor by Mr. Charles Thorpe, Mr. Saville-Kent submitted a replica that he had prepared as a lantern transparency of a water-colour drawing of the same birds that had been executed for him by the bird artist, Mr. J. S. Kentemans, from living examples that were recently in his possession, and which drawing was reproduced in his last work, *The Naturalist in Australia*. This example was specially referred to as demonstrating the applicability of the process adopted for the reproduction in a like manner of coloured illustrations from other more rare and costly natural history or artistic publications.

#### NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE Annual Exhibition of the work of the members of this Society was held at Jubilee House, Hornsey-road, N., on the 4th, 5th, and 6th inst.

In reviewing photographic societies' exhibitions it has been our duty, more frequently than not, to criticise adversely the system of classification adopted. We have been assured by society officials that a division into classes is necessary for the success of an exhibition; in effect, that, unless there is some chance of an inferior photograph gaining an award, those members who know they cannot produce pictures equal to the standard of the leading members of the society will not exhibit. We have often endeavoured to show the fallacy of this method of reasoning, and have always had sufficient faith in the *esprit-de-corps* of the members of our leading societies to believe that they would work quite as enthusiastically to make their exhibition a success without the adventitious stimulus of medals or awards. In the North Middlesex Society's Exhibition we have a notable proof of our contention to a certain point. It is true that there are awards, but only in a very limited sense can they be compared with the silver and bronze medals, &c., that are usually offered for competition. There are no classes, and the function of the Judges is to select from the collective exhibits those among them that they consider worthy of particular distinction. The award takes the form of a certificate. The system is, in fact, that of the Royal Photographic Society's Exhibition. That the North Middlesex Society is justified in its method is proved by the fact that, for some years at least, no local society has been able to make annually a better show, entirely the work of its own members, than this Society does, and very few societies indeed do as well.

We are pleased to report that this year's Exhibition was quite up to the usual standard. To say that it was not greatly in advance of last year's show does not imply any reproach on the Society, for the work had already reached the standard upon which improvement must necessarily be slow. There was, however, a notable absence of work which demonstrated the usual faults of the beginner. We heartily join with the Judges, Messrs. Jas. A. Sinclair, F.R.P.S., and F. C. Tilney, in the regret expressed in their report, "that outdoor figure studies have not made more claim upon the attention of the members," and we commend this to the attention of members.

There is very little doubt that, although we keep our place as landscape photographers, we are becoming woefully behind our foreign brethren in figure studies. In lantern slides the Society has done remarkably well. Lantern-slide work is certainly not as popular as it was, and it is a notable feature of this Society that the exhibits of lantern slides have both increased in number and very greatly improved in quality.

The abstract of the printing processes employed, as given in the catalogue may be interesting: Bromide, 60; carbon, 44; gum-bichromate, 7; platinum, 47; gelatino and collodio-chloride, 8. The number of

frames was about twenty less than last year; but, as the average size was larger, the walls were as well covered. The general arrangement of the gallery was as usual, and we need hardly say the details of the Exhibition were carried out admirably.

The Judges comment upon the fact that some of the finest work is included in that marked "not for competition." The members whose work was so marked were Mr. J. C. S. Mummery (President of the Society), and Mr. H. W. Bennett, and among their exhibits were several that were shown and duly admired at the last Pall Mall Exhibition. After these Mr. R. R. Rawkins comes off with the most honours, as will be seen by the list of awards, and they are honours which were well deserved. With another year's practice he ought to come well to the front. In addition to those exhibitors whose works have been distinguished by the Judges, there were admirable pictures shown by Messrs. R. Child Bayley, E. R. Mattocks, W. Taylor, and J. W. Marchant; and lantern slides by Messrs. F. A. Bishop, J. M. Ainsley, A. T. Crane. A set of lantern slides of astronomical subjects by Mr. S. J. Clay, marked "not for competition," deserved special praise.

#### THE AWARDS.

Pictures.—*Ancestral Trees*, Mr. A. G. Lawson; *Memories*, Mr. A. H. Lisett; *Land of the Mountain and Flood*, Mr. Charles Beadle; *A Fair Artist*, Mr. H. Stuart; *A Watch Boat*, Mr. R. R. Rawkins; *In the Smithy*, Mr. J. J. Armitage; *Winding the Bobbins*, Mr. G. A. Barton; *The Chancel, Hereford Cathedral*, Mr. D. H. W. Broad.

Lantern Slides.—Messrs. H. W. Mattocks and R. R. Rawkins.

#### COMMENDED.

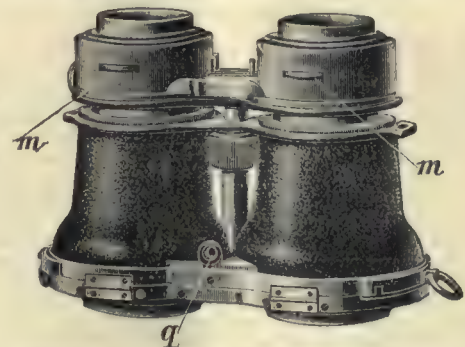
Pictures.—*A Canal Lock*, Mr. R. R. Rawkins; *Christ Church College Cambridge*, Mr. R. R. Rawkins; *Sunshine*, Mr. S. Herbert Fry.

## Our Editorial Table.

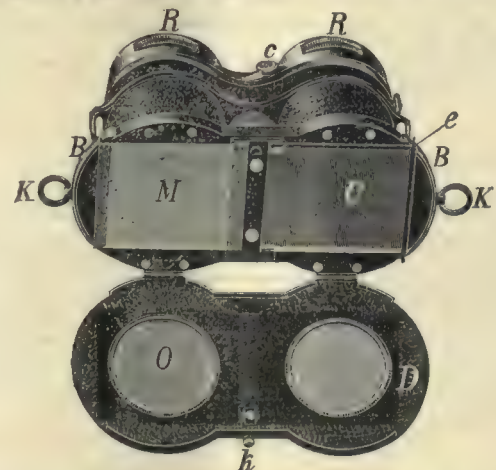
#### THE GOERZ PHOTO-STEREO BINOCULAR.

Manufactured by C. P. Goerz, 3 & 4 Holborn-circus, E.C.

This ingenious little instrument fulfils the three functions of opera glass, field glass, and photographic camera, monocular or binocular. The first



of the two illustrations shows it closed up, *m* indicating revolving diaphragms, and *q* the lug for attaching the camera to a stand. The



second illustration shows the back of the instrument, carrying the binocular lenses, let down, and giving a view of the ground glass, *x*, and



the plate-holder, c. K, k pull out the sliding frames, B, B, in which the plate-holders are placed; R, n carry the binocular eyelenses and the camera objectives. A shutter is actuated at c. The plate-holders are of thin sheet metal and take plates 4½ x 5 cm. By one or two simple adjustments of pegs situated near to c, but not visible in the block, the camera is adapted for either monocular or binocular work. The image may be focused and very rapid exposures given. When K is drawn out the shutter covering the plate is removed, and after exposure K is pushed back and the plate-holder easily removed. The movements for converting the instrument from a camera into an opera or field glass are exceedingly simple—indeed, “in changing the instrument from binocular to camera or *vice versa* no unscrewing or separating of the parts is necessary.” The Photo-stereo Binocular should find many admirers.

#### SIENNATYPE PAPER.

Otto Scholzlg, 131, Binsfield-road, Clapham-road, London, S.W.

THIS paper yields prints of a peculiarly pleasing shade of reddish-brown, and we have no doubt that many photographers will welcome and appreciate it. We append the instructions for use:—Print out to the depth of an albumen or P.O.P. print. Soak the prints three minutes in a one per cent. solution of carbonate of potash or carbonate of soda, then wash in two changes of water. Tone and fix ten for twenty minutes in the following combined toning and fixing bath:—

Water ..... 16 ounces.  
Hypo ..... 3 ”

Dissolve and add—

Sulphocyanide of ammonium ..... 3 drachms.

When dissolved, add—

Gold solution (one grain to the drachm) ..... 7 drachms.

The bath is ready as soon as mixed, and will be sufficient to tone seven full sheets of paper, when it should be replaced by a new bath. Wash thirty minutes in many changes of water.

A great variety of tones can be produced with Siennatype paper if, after the potash bath and washing, the prints are toned in any of the baths recommended for albumen paper, and subsequently fixed in hypo.

#### THE “ROYAL” PLATES.

Manufactured by Cadett & Neall, Ashtead, Surrey.

UNDER the happily chosen name of the “Royal,” Messrs. Cadett & Neall are placing on the market a new brand of plates. With the developing formulae specially mentioned in the instructions, the rapidity of the plates = 100 H. & D. Qualitatively speaking, the negatives yielded by the “Royal” plates are all that can be desired, a clean, fine-grained deposit with sufficient opacity in the shadows being their characteristics. Moreover, their degree of rapidity is such that they present the maximum of ease and convenience in manipulation. A special feature of the “Royal” plates is that the quarters, as well as some of the larger sizes, are specially packed, so that repacking is simplified. Thin glass is chosen, and two plates are placed face to face in contact, the films not being cut through. Before filling the slides or sheaths, the slightest pressure severs the films. After exposure they are repacked, film side to film side, and secured in the tissue wrappings by means of rubber bands, which are placed round the original packages. Many travelling amateurs will, we are sure, appreciate these little conveniences so thoughtfully provided by Messrs. Cadett & Neall, who consider the “Royal” the best plate they have yet marketed. As the Ashtead house has always borne a very high reputation for the quality of their plates, the “Royal” should add another to the many successes they have achieved in this branch of photographic manufacture.

#### GRAVURA OPALS.

Manufactured by the Paget Prize Plate Company, Watford.

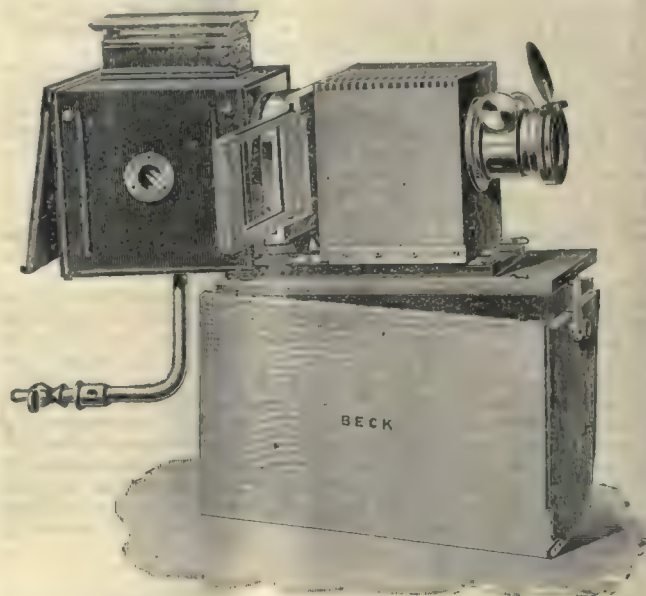
THE fact that they may be manipulated in weak actinic light, coupled with their adaptability for giving a range of colour, should make Gravura opals exceedingly popular. We have often wondered that photographic printing on opals was not taken up to a greater extent by amateurs than we find to be the case. They have only to realise how easily Gravura opals yield good results, and we imagine that many will take up this form of printing for a purpose to which it is so well adapted, namely, domestic decoration. Besides full instructions for making Gravura opals and lantern plates, each package of plates contains pieces of paper coated with the same emulsion as the opals for trial exposures—a great convenience.

#### THE “LUVEX” LANTERN.

R. & J. Beck (Limited), 68, Cornhill, E.C.

THIS lantern has been specially designed for home use. As illustrated, it is arranged for ordinary house gas in connexion with the Welsbach

burner; the only operation necessary is the joining up of the tube, c, to any handy gas supply. The polished mahogany box into which the lantern is packed away measures only 12 inches by 8 inches by 7 inches over all, and in it there is also room for the slide-carrier, cowl, and incandescent attachment. The lantern, when extended, measures 2 feet by 1 foot 6 inches by 7 inches. The box which contains the lantern has a hinged lid, which enables the instrument to be considerably tilted. To put the lantern away, the objective, D, is unscrewed and rescrewed in



position on its flange inside the mahogany chamber, r, which is then pushed up as far as possible towards the condenser. The slide-carrier, x, having been removed, the square Russian iron body, B, is then slid upwards off its brass support, reversed, and pushed down on the same support, but in a reversed direction, over the condenser, mount, and mahogany chamber, r. When this operation is completed, and the cowl, A, taken off, the lantern measures only 7 inches by 6½ inches by 5 inches. The lantern is then unscrewed from the tilting lid and slipped



into the box, when there will be found to be room for the slide-carrier. Welsbach attachment, gas bracket, iron cowl, &c. The “Luvex” tracing-paper screen is made of paper, and is mounted on a spring roller, so that it is always kept in good condition. When wanted for use, it is simply pulled out by the top lath, and, being fully extended, the side laths are fixed and the feet spread out. When closed, it is in the shape of a long compact box. The screen is 3 feet 6 inches square, a convenient drawing-room size.



## WIMBORNE AND CHRISTCHURCH.

By the REV. THOMAS PERKINS, M.A.

134 pp. With about sixty illustrations. Price 1s. 6d.

London: George Bell &amp; Sons, York-street, Covent-garden, W.C.

MR. PERKINS, whose name is, of course, familiar to our readers as a frequent and appreciated writer on photography, gives in this little book a short history of the foundation and a description of the well-known Minster at Wimborne and the Priory at Christchurch. The book is full of the most interesting details concerning the two churches, and the excellent reproductions of Mr. Perkins' carefully taken photographs very greatly add to its value. To ourselves, who have often visited the great Priory at Christchurch, the volume is especially useful, but we imagine that the book will appeal to a very wide circle of readers interested in the history of our cathedrals and larger churches.

## THE STANDARD DICTIONARY.

AMERICAN printing and publishing productions are always well to the front, and Messrs. Funk & Wagnall's Standard Dictionary, which is being issued by arrangement with the *Illustrated London News*, and can be had on the instalment plan, supplies our bookshelves with another very excellent work of reference.

The dictionary claims to contain nearly 80,000 more terms than any other work of a similar character, and its illustrations, particularly its coloured plates, are superb.

The patent index, which enables the reader to put his finger on the reference letter without having to turn over page after page, is very useful, and altogether the work, which is in two volumes, is replete with every modern improvement.

MESSRS. L. GAUMONT & Co., of 25, Cecil-court, London, W.C., have issued a new catalogue of the Lumière & Elgé cinematograph films, the drawing-room chromo projector, the Lumière projector, &c.

## OUR RARER BRITISH BREEDING BIRDS: THEIR NESTS, EGGS, AND SUMMER HAUNTS.

By RICHARD KEARTON, F.Z.S. With seventy illustrations from photographs by C. Kerton. 150 pp. Price 7s. 6d. London: Cassell & Co., Limited.

THE MESSRS. KERTON have again placed lovers of natural history under an obligation to them by this superb book. It appeals in an especial manner to bird lovers by reason of the rarity of many of the subjects that are described and photographed; but it is also assured of general welcome, for it is the record of most painstaking endeavours to set before us evidence of the richness of ornithological treasures with which these islands abound. In a publisher's note we read that whilst engaged upon the preparation of the book, the brothers Kerton travelled about ten thousand miles. They have culled their materials from different parts of England, Scotland, Ireland, Wales, and the surrounding islands, and the book includes pictures of the nests, eggs, or breeding haunts of nearly sixty species not pictorially represented in their previous work on *British Birds' Nests*. These include such rare specimens as the marsh, montagu, and hen harriers, kite, whimbrel, siskin, crossbill, chough, Kentish plover, osprey, and red-necked phalarope.

In his preface the author enters a strong plea for the better protection of wild birds and their eggs than is afforded by the Acts dealing with the matter, and in this he will secure the widest sympathy. The descriptive matter is terse and lucid, and we do not know which to praise the most highly, the splendid photographs or the really fine half-tone reproductions of them. We have not seen better of either. Altogether it is a remarkably beautiful book, and it well merits a place in the library of every lover of natural history and bird life.

## News and Notes.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On December 14 there will be a Lantern Night, when Mr. Thomas E. Freshwater will show some recent photo-micrographs. Visitors are always welcome.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, December 12, at 86, Russell-square, at eight p.m. Mr. Thomas Bolas will read two papers, "Notes on the Use of the Dallmeyer Focometer," and "The Origination of Printing Types by Photographic Methods."

THE second volume of Dr. Isaac Roberts' *Photographs of Stars, Star Clusters, and Nebulae* is about to be issued from the publishing office of Knowledge. It will contain seventy-two photographs reproduced by the collotype process, in addition to many pages of text. Only a limited number of copies of the work will be available for the public.

THORNTON HEATH POLYTECHNIC PHOTOGRAPHIC SOCIETY.—A lecture, entitled "The Elementary Principles and Practical Uses of the Photographic Lens," illustrated with limelight diagrams and mechanical slides, will be delivered by Mr. F. O. Bynoe in the lecture-room of the Thornton Heath Polytechnic on Tuesday, December 12, at eight o'clock precisely. The chair will be taken by Dr. C. Owen Fowler.

Re WILLIAM HENRY FREDERICK BOWMAN, lately carrying on business as a photographer, Heaton-street, Gainsborough. The public examination of the above-named debtor took place at the last sitting of the Lincoln Bankruptcy Court, before Mr. Registrar Stephens. The statement of affairs filed by the debtor showed liabilities amounting to 141l. 12s., and assets estimated to produce 14l. 15s. The debtor attributed his failure to putting an instalment of electric light in the Albert Theatre and never getting paid for it. The order was given him by Mr. Kirk, but when he tried to recover the money the defence was that he had put the instalment in as an advertisement. Altogether the cost alone was 900l., and he spent an additional 40l. in law expenses. Subsequently the fittings were removed, but the cost of taking them out was more than they realised. Mr. Tweed, for certain creditors, questioned the debtor concerning the alleged sale of his photographic business, and the examination was eventually adjourned.

TO "TELE-PHOTOGRAPH" THE BOERS.—The *Daily Mail* says: "For the first time in history, the tele-photographer is about to play his part—it may be a very important part—in warfare. Second-Corporal Ford, of the Royal Engineers, Chatham, has been detailed as tele-photographer to the Army in South Africa, and has sailed from Southampton with his cycle and apparatus. Corporal Ford's camera, which is fitted with tele-photo lenses, will take a clear photograph of a man, or battery, or entrenchments, at any distance up to two miles, so that, beyond the range of the enemy's rifles, Corporal Ford will be able to get photographs of their positions, which should prove of great value. As military tele-photographic scout he ought to be able to render very useful service to the British Army. The special apparatus was devised by Lieutenant Foulke, R.E., and made by the London Stereoscopic Company. It is fixed on to Corporal Ford's bicycle in such small compass as to be hardly noticeable, and the whole thing—bicycle and apparatus—is painted the familiar khaki colour."

THE Secretary of the British Mutoscope and Biograph Company last week wrote to a daily contemporary in these terms: "In your issue of this day, under the head of 'A Mutoscope Exhibition: Alleged Indecent Pictures,' a paragraph appears in which, having referred to the popularity of the mutoscope exhibitions, you give an account of the proceedings taken by the police against the occupier of the premises, No. 69, High Holborn, for exhibiting for the purpose of gain indecent pictures at that address. Will you allow me to say that the term 'Mutoscope' is not a generic word, but a registered trade mark, the property of this Company, and is applicable only to moving pictures. The pictures which were seized were not of this class, being ordinary stereoscopic coloured photographs; they have no connexion with this Company or any one having relation with it, and were exhibited in machines called 'kalloscopes.' We are informed that the word 'Mutoscope' was not mentioned throughout the proceedings. We welcome this action on the part of the authorities."

## Meetings of Societies.

## MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
11.....	Bradford Photo. Society .....	Mounting and Framing. A. Keighley F.R.P.S.
11.....	Camera Club .....	Photographic and Mechanical Discussion.
11.....	Kingston-on-Thames .....	Architectural Photography. C. H. Oakden, F.R.P.S.
11.....	Oxford Camera Club .....	Exhibition of Members' Lantern Slides and Apparatus.
12.....	Birmingham Photo. Society ..	Technical Control for Pi torial Results. W. Thomas, F.R.P.S.
12.....	Hackney .....	Microscopical Lantern Projection. Messrs. Drake and Dean.
12.....	Leeds Photo. Society .....	Demonstration: Theory, Practice, and Results with Sandell Perfect Films and Plates (Multiple). J. T. Sandell.
12.....	Royal Photographic Society ..	Notes on the Use of the Dallmeyer Focometer and The Origination of Printing Types by Photographic Methods. Thomas Bolas.
12.....	Tunbridge Wells .....	Gleanings from the East. E. R. Ashton.
13.....	Ashton-under-Lyne.....	Demonstration: The Sandell Perfect Plates and Films. J. T. Sandell.
13.....	Borough Polytechnic .....	Secoo Film.
13.....	Photographic Club .....	Members' Open Night.
13.....	Southsea .....	Demonstration: Lantern-slide Making with Kristal Lantern Plates. Messrs. B. & J. Edwards.
13.....	Southport .....	Exposure. Alfred Watkins.
13.....	West Surrey .....	The Treatment of Weak Negatives. J. T. Price.
13.....	Woodford .....	Demonstration: Kristal Lantern Plate. Mr. Goodwin.
14.....	Camera Club .....	Palestine of To-day. Major-General Sir Charles William Wilson, R.E., K.C.B., K.C.M.G., F.R.S., &c.
14.....	Leigh .....	Lantern Lecture: How a Lens is Made.
14.....	Liverpool Amateur.....	The Valley of the Wye. Fred. A. Schierwaer.
14.....	London and Provincial .....	Lantern Night: Some Recent Photo-micrographs. Thos. E. Freshwater.
14.....	Oldham .....	Exhibition of Prize Slides.
15.....	Ashton-under-Lyne.....	Elementary Photography Class.
15.....	Borough Polytechnic .....	Practical Evening: Artistic Cutting and Mounting.
15.....	Croydon Microscopical .....	Practical Notes on Outdoor Work with the Camera. Rev. A. H. Blake, M.A.
15.....	West London .....	Beginners' Meeting: Exposure and Development. G. F. Blackmore.



## ROYAL PHOTOGRAPHIC SOCIETY.

DECEMBER 5.—Lantern Evening.—Mr. J. J. Vezev in the chair.

## LINCOLN CATHEDRAL.

Mr. FREDERICK H. EVANS delivered a lecture on "Lincoln Cathedral," illustrated by about one hundred and thirty slides from his own negatives, and Mr. Evans's photographs of the English cathedral church are so well known that it is hardly necessary to say that the ladies and gentlemen who disregarded the weather and found their way to Russell-square on Tuesday evening were amply repaid for their trouble. In the course of his brief introductory remarks, the lecturer said he thought that in architecture photography found its most useful and least hampered exhibition; architectural subjects imposed less restrictions than landscape or figure work, their form was stable and motionless, the gradation and translation of their colour was not difficult of rendition; and, although they called for accurate drawing, good composition, and true effects of light and shade, photography was capable, in the hands of an artist, of adequately dealing with all these elements and of yielding truer and more complete results than could be expected from the average painter or draughtsman. To do such work, and to do it properly, called for incessant study, observation, and training of the eye and the memory, and for an apprenticeship as exacting as that of the draughtsman or painter. To do justice to a building it was necessary to devote great attention to the niceties of composition and of light and shade, and even in so apparently simple a matter as taking the detail of a carved capital there was a wrong position and a right one for the camera, and the direction of the light must also be correct if the details were not to be confused or ill-drawn or improperly massed. To isolate and study and appreciate the more recondite beauties of a cathedral, one must visit it many times and see the building at all hours and in all qualities of light, the brilliant sun and the quiet grey day each having its own value and effect. Each picture exists at its best at but one part of the day, perhaps at but one half-hour of the day, and every composition that one thinks worthy of recording should be seen and studied at all hours to find its truest lighting. Turning to the subject of the lecture, Mr. Evans first showed some general views of the cathedral from various parts of the city, those from the High-street and Steephill being particularly effective; and he then proceeded to conduct his hearers over the whole of the noble minster, giving historical, architectural, and archaeological particulars of every detail of the structure. As an instance of the thoroughness of his treatment of the subject, it may be said that the west front alone was illustrated by no less than twenty-one slides, including representations of Norman work behind the Early English arcading, the Saxon sculptures depicting scenes from Old Testament history, the eleven kings over the doorway, &c. Then some very fine photographs of the south-west and central towers were shown, these being followed by interior views—the nave, font, aisles, organ-screen, north and south choir aisles, the beautiful angel choir (ten or more views), the choir, transepts, presbytery, and chapter-house. The extraordinary grotesque sculptures near the north-east transept afforded what the lecturer called "comic relief" both to the lecture and the cathedral. The last picture was an exceedingly pretty view from the vicar's court, taken in early spring, the delicate branches of the trees acting as a lovely foil to the matchless towers seen through them.

Mr. JOHN LIGHTON, F.S.A., at the close of the lecture, exhibited two old prints from waxed-paper negatives, and expressed his astonishment at the marvellous progress of photography since the time when those negatives were taken, referring to the advances which had been made in photo-mechanical work, which he described as "perfectly stunning and astounding." He said that the *Graphic* had now entirely ceased to employ engravers except for "finishing" work.

## COMING EVENTS.

December 12, Ordinary Meeting, "Notes on the Use of Dallmeyer's Focometer" and "The Origination of Printing Types by Photographic Methods," both by Mr. T. Bolas. December 19, Photo-mechanical Meeting, "Negatives for Three-colour Work," by Captain W. de W. Abney, F.R.S. January 2, 1900, Lantern Evening, "Round about the Matterhorn and the Aletsch Glacier," by Mr. H. Speyer.

## LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 30.—Mr. R. P. Drage in the chair.

Mr. H. VIVIAN HYDE gave a lantern show, entitled

## LOWESTOFT AND NEIGHBOURHOOD.

The character of the country was well portrayed by a large number of typical pictures, taken mostly with the hand camera, and naturally a good proportion was connected with the staple industry of the town. The quays, the departing and approaching smacks, the harbour loungers and market people offer splendid opportunities to the observant photographer, and it was hereabouts that Mr. Hyde perhaps succeeded best. Leaving Lowestoft, the audience was conducted inland to the "broads" district, Oulton, Beccles, &c., on to Norwich. The display was concluded with a few slides taken in Surrey in the vicinity of Dorking and Guildford. A vote of thanks was passed to Mr. Hyde.

## PHOTOGRAPHIC CLUB.

NOVEMBER 29.—Mr. F. A. Bridge in the chair.

There was a large gathering to hear Mr. THOMAS FALL's chat on

## WILD AND DOMESTIC ANIMALS, AND HOW I PHOTOGRAPHED THEM.

drawn together by the knowledge of his successful treatment of a most-trying and difficult subject. The real secret seems to be to cultivate an unflinching patience, and to study sympathetically the many peculiarities of the animals one has to deal with. It has been a long study with Mr. Fall, as his results conclusively show, and the quality of the pictures and his lucid description of the habits of the subjects well deserved the hearty vote of thanks which was accorded to him.

Richmond Camera Club.—November 27.—Mr. J. D. GIBSON (one of the Hon. Secretaries of the Club) gave a demonstration on

## COPYING.

He showed how, by means of strips of magnesium ribbon burned on each side of the object to be copied, care being taken to shield the light so that none of the direct rays could reach the lens of the copying camera, it was easy to obtain a negative of a portrait, landscape, &c., photographic or otherwise. Of course, in copying a coloured picture or other object, it was necessary to use orthochromatic plates and a screen, but for copying photographs or engravings ordinary plates answer perfectly. The object of burning the ribbon on both sides of the object was to obtain evenness of illumination, and to prevent the grain of the paper or other material showing. Mr. Gibson referred to the ease with which the exposure could be regulated, and the certainty of achieving uniform results when once the correct amount of ribbon to be burned and the stop to be used in the lens had been ascertained. He then made two copies of a cabinet photograph on quarter-plates, one with eight inches of ribbon, and the other, at the suggestion of Mr. Cembrano, with four. The former result was thought to be the better of the two negatives, both of which were, however, very satisfactory.

South London Photographic Society.—Mr. W. H. DAWSON, the President of the Woolwich Society and also a member of the South London Photographic Society, on Monday, December 4, gave his brother members a lecture entitled

## A BRIEF HISTORY OF BRITISH ARCHITECTURE,

exhibiting most of the various types by pictures projected by the lantern. The lecturer had taken very great pains to procure examples of the different styles and their gradual transformation from the best-known subjects in England, and conclusively proved to his audience that there is more in architectural photography than mere records or picture-making.

Eccles Photographic Society.—On Monday, November 27, a very representative meeting of photographers was held in the rooms of the Co-operative Society, Eccles, when it was unanimously decided to commence a photographic society. A goodly number at once joined, and a strong working Committee was appointed, with Mr. J. Morris, Ph.D., F.C.S., Boardman-street, Eccles, as Hon. Secretary, and Mr. E. Johnson, Da Vinci, Ellesmere Park, Eccles, as President. The first meeting is to be held early in the new year, when it is proposed to have a social meeting, at which apparatus, negatives, prints, lantern slides, &c., can be inspected by the members.

Leeds Camera Club.—November 29, Mr. R. Bourke (Vice-President) in the chair.

## THE WELLINGTON &amp; WARD NEGATIVE FILMS

were the subject of a lecture given by Mr. HARRY WADE, of Manchester. The use of films, said the lecturer, appealed to the amateur photographer on account of their lightness, for it became a serious matter to carry with him many plates when on a walking or cycling tour. Hitherto many difficulties had to be encountered, but he thought he would be able to show them that with this film they had been successfully overcome. It was a film of gelatine, coated as an ordinary plate on a support of white paper, and was placed in the slide in the ordinary way, having a piece of thick cardboard behind it to hold it in position. It was of sufficient speed to be used for rapid exposure; and the emulsion admitted of almost any degree of density being obtained in the subsequent development. Being in optical contact with its support, halation was altogether absent, and so one of the most messy but still necessary operations with the ordinary plates was avoided. In the manipulation there was not the difficulty usually met with; there was no curling, the films were soaked until limp, and developed in the usual way, and, whilst the makers advocated the pyro-ammonia developer, yet pyro soda, or any of the later developers in use, could be used with satisfactory results. The paper support was sufficiently transparent to enable density to be judged by transmitted light, although, of course, no image was visible at the back. When developed, they were well washed and immersed in a weak alum bath for ten or fifteen minutes, washed again, and fixed in the usual hypo bath, and finally well washed for about an hour, then squeezed on to a waxed ferrotype plate. When quite dry they easily came off. The film had now to be removed from its paper support, which was done by cutting through the film down one edge, taking care not to cut the support, and, by inserting the point of a penknife and running it round the edge, the film could be then easily withdrawn by the fingers. The back of the film, being a matted surface, readily lent itself to any retouching or work on the same without any medium being applied, and in the printing could be used from either side, a most obvious advantage in the case of carbon work. The films were put up in the sizes of ordinary plates, and for hand-camera work were spooled to fit the roll-holders in present use. The negative film is flexible, of sufficient body to stand rough handling, and could be protected against silver staining by being immersed in any suitable varnish. A large series of prints and negatives were passed round for the inspection of the members present, showing that, for fineness of grain, delicacy of gradation, they gave everything that the makers claimed for them.

Liverpool Amateur Photographic Association.—November 30.—Mr. Paul Lange presided, and there was a large attendance of members present. Four new members were elected, and the President drew the attention of members to the fact that the date of the annual competition had been altered from December to January, thus giving rather more time for the preparation of prints. At the conclusion of the usual business, Mr. G. E. THOMPSON gave a most interesting account of a trip to the Riviera, taking as his title,

## THE RIVIERA, ANCIENT AND MODERN.

The lecture was enlivened with many witty passages, personal anecdotes and experiences, and was listened to with rapt attention. The pictures were, as usual, up to Mr. Thompson's high standard of excellence, some of the cloud studies being very fine.



## FORTHCOMING EXHIBITIONS.

1899.		
December 8, 9 .....	Hove Camera Club. C. Berrington Stoner, 24, Holland-road, Hove.	
" 8-18 .....	American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.	
" 11-Jan.1900	Huddersfield (Invitation). W. A. Beevers, Cloth Hall-street, Huddersfield.	
" 27-30 .....	Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.	
1900.		
January 29-31.....	Southsea Amateur Photographic Society. F. J. Mortimer, 10, Ordnance-row, Portsea.	
April 3-7 .....	Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.	

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Patent News.

THE following applications for Patents were made between November 20 and November 25, 1899:—

- PRINTING FRAMES AND REVOLVING STAND.—No. 23,185. "A New or Improved Combined Photographic Printing Frame and Retouching Stand." Complete specification. Communicated by J. L. Brouse, G. Macay, and F. Quilty. B. HADDAN.
- DEVELOPING APPARATUS.—No. 23,207. "Improvements in Apparatus for Use in Developing, Fixing, Washing, and Drying Photographic Films or Plates." E. J. E. HELIE.
- CINEMATOGRAPHY.—No. 23,217. "An Improved Apparatus for Exhibiting or Displaying a Series of Cinematographic or other Pictures." Complete specification. O. MESSTER.
- ROLL-HOLDERS.—No. 23,223. "Improvements in Photographic Film Roll-holders." Complete specification. W. BEUTLER.
- SHUTTERS.—No. 23,351. "Improvements in Photographic Shutters, Stationary and Movable." W. O. STANLEY.
- FILM CLIP.—No. 23,379. "A Clip or Holder for Maintaining Photographic Films in a Flat or Stretched-out Condition, and for Analogous Uses." A. GROSJEAN.
- CAMERAS.—No. 23,515. "Improvements in and relating to Photographic Cameras." S. D. MCKELLEN.
- PRINT CUTTERS.—No. 23,528. "Improvements in Appliances for Cutting Photographic or other Prints or Paper." J. DAVENPORT.

## Correspondence.

\*.\* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\*.\* We do not undertake responsibility for the opinions expressed by our correspondents.

## ORTOL.

To the EDITORS.

MEIN HERR,—I also write you to give to you my ideas of the new developer, Ortol Hauff. I do myself consider it one off zie best, equal to mein oll friendt Pyro-Soda, and I now hurry to give particulars of mein own experience. On die hottest days off zie past summer, I make much development with die Ortol, having before used nearly always the Pyro-Soda. I find with die Ortol that I have zie more latitude, zie more control, zie use of zie one solution for many plates, zie plain fingers and odder good things. Beelow I giv the results, all done with the one 8 ozs. developer.

Off Plates .....	5000
" Films .....	2500
" Transpare .....	2000
" Brom Prints .....	250
" Enlargements .....	10
Total .....	9760

I also find zie developer after use as above quite as goot, but not so rapide.

With friendly greetings, I recommend myself to you in the best way possible.—Alleways,  
Antroff Strass, 64, Berlin.

HENDRICH SAPT.

To the EDITORS.

GENTLEMEN,—Mr. Welford's paper on "Ortol" is most interesting, but I think his formulæ are rather puzzling. The mixture of "parts" and grains is difficult to follow. For instance, on p. 756, for bromide paper he advises: Ortol, 1 part; soda,  $\frac{1}{2}$  part; sulphite, 1 part; water, 1 part; and about 20 grains of bromide. If the part taken is 1 ounce, we have here  $3\frac{1}{2}$  ounces. How much bromide must we add? In a previous paper he mentioned so many grains "per ounce." If he means this here, we shall have more than sixty grains, which seems a very large amount. I hope he will explain, as I am anxious to try this developer for bromide papers.—I am, yours, &c.,

C. E. F. N.

To the EDITORS.

GENTLEMEN,—Re Mr. Welford's article in your last week's number. Possibly I am very dense, but I fail to understand the composition of the above developer. 1 part ortol; 1 part water;  $\frac{1}{2}$  part soda; 1 part sulphite; 20 grains bromide; about  $3\frac{1}{2}$  parts total. Thus, if I want to make 9 $\frac{1}{2}$  ounces of developer, do I take 3 ounces ortol! 3 ounces water! 3 ounces sulphite!  $\frac{3}{4}$  ounce soda! 60 grains bromide?—I am, yours, &c.,

NOVICE.

## MASONIC LODGE FOR PHOTOGRAPHERS.

To the EDITORS.

GENTLEMEN,—May I trespass upon your valuable space to give further prominence to the above scheme, which has already been most favourably received by many London Masons, but to bring about the successful fulfilment of the idea we require not only the support of London Masons, but of the provincial ones also?

I shall be glad to receive the names and addresses of all who are willing to support such a lodge, so that I can communicate with them as to a preliminary meeting to discuss details.—I am, yours, &c.,

WM. E. DUNMORE.

110, Shaftesbury-avenue, London, W., December 1, 1899.

## THE ECLIPSE PHOTOGRAPH AT THE LATE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

To the EDITORS.

GENTLEMEN,—I am afraid that I cannot avail myself of Mr. Bremner's offer in your last issue. Probably my last letter to you will explain to that gentleman the precise objection which I have made to the photograph in question, and you may think that the subject is used up. I will, however, write a few words in case you may be disposed to allow further discussion on the subject.

Mr. Bremner's letter explains a good deal which I could have no knowledge of. It is abundantly clear that the exposure he gave was such as any one conversant with the subject could have told him would not result in a picture of the eclipse. As he does not give the necessary data for determining the ratio of focus to aperture, or the plate used, I cannot say how much the plate should have required, but it is evident that the exposure was a somewhat full one for clouds, and must have entirely reversed the sun's image. That is not strange. What is so is that any photographer should have supposed that the source of light and heat should have been truly represented by a black disc. I have observed many solar eclipses; possibly I began to do so before Mr. Bremner was born, and I do not think, though it is now some years since I left India, that my acquaintance with the subject is quite forgotten in that country, so that it will not be difficult for Mr. Bremner to satisfy himself that my assurance is not without some justification, when I repeat that the picture exhibited is not a representation of the phenomenon of a partial solar eclipse anywhere; it fails in the truth of the very thing it purports to depict. And that others who have followed the same procedure should have arrived at the same erroneous result does not prove its truth. I am quite satisfied with the statement that the enlargement is *bona fide* (though I acknowledge that I had a suspicion that the clouds were from one negative and the eclipse from another), but I fancy that photographers generally, when they get a reversed negative, either destroy it or keep it as a curiosity. In this case the photographer has enlarged it and exhibited it as a true picture, and he seems still to argue that it is a true representation of what took place.—I am, yours, &c.,

J. F. TENNANT, Lieut.-General R.E.

Clifton-gardens, Maida-hill, W., December 1, 1899.



## ADDRESS OF A SCULPTOR.

To the Editors.

GENTLEMEN.—We saw in your issue of the 1st instant your reply to initials "W. D." re carving busts from photographs. We would venture to ask if you could kindly place us in communication with your correspondent. We have executed work, figure and otherwise, in several of our English cathedrals, and in many leading churches both in London and the provinces. We have had the honour to recently erect the statue of the Queen in our local college, and the whole of the carving and sculpture in the Cheltenham Ladies' College was intrusted to us.

We are exhibitors at the Royal Academy, and one of our last works was a statuary marble-bust of one of our English admirals. This, we trust, is a sufficient proof of our *bona fides*, and we should be glad to hear further of what is required.

Thanking you for your kindness,—We are, yours, &c.,

H. H. MARTY & Co., Sculptors.

Sunning-end, High-street, Cheltenham, December 5, 1899.

To the Editors.

GENTLEMEN.—There is a querist in your last issue who asks for a person who can model busts from photographs. A Mr. Ivor Thomas, Waterloo-street, Swansea, is a gentleman who is exceptionally clever at this work.

I have seen several of his productions, which were strikingly true to the originals.—I am, yours, &c.,

CHAS. H. EVANS.

12, St. Helen's-road, Swansea, December 4, 1899.

To the Editors.

GENTLEMEN.—Mr. D. A. Tonelli, Chatfield-road, Croydon, is known to me as being experienced and clever in carving busts from photographs. An excellent example of his work can be seen in the Croydon Town Hall.—I am, yours, &c.,

HECTOR MACLEAN.

34, Birdhurst-road, Croydon, December 1, 1899.

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

C. W.; POSITIVE, and others.—In our next.

ADDRESS OF A SCULPTOR.—Mr. W. E. Meadows, of 59, Scott-street, Bootle, Liverpool, writes: "I can show specimens of work done in plaster and marble from photographs."

ADDRESS OF SCULPTOR.—MR. LOUIS SHOTS (Waverley House, Ockers-street, C.-on-M., Manchester) writes: "I undertake to model and carve any bust after a photograph. I am a gold medallist of the Royal Academy of Antwerp, Belgium, and established here at Manchester."

PHOTOGRAPHY IN THE EAST.—EGYPT says: "Can you tell me what the light is like during February and March in Egypt and Palestine for snap-shot work? Does it compare with our summer, and what exposure and stop should be recommended?"—In reply: Some reader who has had experience of Eastern photography may perhaps oblige our correspondent with a few hints.

TINTED DEVELOPER.—B. STONE says: "I made up a fresh batch of ten per cent. pyro solution with sulphite the other day, and it is quite a pale sherry colour. On using it, I find it work all right in every way. What I want to know is, if the negatives developed with it will be as permanent as those made with a colourless pyro solution?"—Yes, the tint in the solution will have no influence on the stability of the finished negatives.

LANTERN SLIDES.—AMATEUR LANTERNIST sends us three lantern slides and asks our opinion of them. He says that he got a friend to put them into his lantern, and he tells him they are too dense, but it was only an oil lamp. What he wants to know is, how they would do if the lime light were used? They would be much too opaque for any light, and, moreover, they are veiled. The higher lights should be bare glass. Over-exposure and over-development are the chief faults.

DISGUSTED ONE.—We doubt if you have any remedy, as it does not appear that you were asked to submit specimens, &c. Our view is, that as you sent them at your own risk you have no case.

ENLARGING.—W. C. J. writes: "I have a lantern by — & Co. with four-inch condensers. What I want to know is, if, in enlarging with it from quarter-plate negatives, should I use a quarter-plate rapid rectilinear, with which they were taken, or a half-plate rapid rectilinear, as I have both?"—Either will do, but it will be impossible to evenly illuminate a quarter-plate negative with a four-inch condenser. One of five-and-a-quarter to five-and-a-half inches is the smallest that will do that.

CLEANING PAINT FROM GLASS.—W. & C. say: "In the spring we stippled over the glass in the roof of our studio with white paint to keep the sun out. This has now changed to quite a yellow and stops off a deal of light, can you tell me how to get it off in the easiest way?"—Apply a strong solution of crude carbonate of potash—pearl ash—and after a time the paint can be washed off. Of course, if any of the salt comes in contact with the paint on the sash bars, it will act on that also.

SPOTS ON NEGATIVE, &c.—OLD READER says: "Please find enclosed a piece of negative. I am troubled with these spots, brown spots, on many of my best negatives lately. 1. Will you, please, let me know the cause? 2. Is Wellington P.O.P. (special) so permanent a paper as any other P.O.P., viz., Imperial, Ilford, &c.?"—1. The cause of the spots is that the hypo salts were not eliminated from the film in the first instance. Then it was printed from when there was moisture in the film or in the paper. 2. Yes, we should say so.

ADDRESS WANTED. STUDIO BUILDING.—"Will you please tell me (1) the address of the Gem Dry Plate Company? 2. I have built a studio out of an existing building, and, as it is only sixteen feet long by eight feet wide, is there any drawback save, of course, lack of room? The roof is a span one, and is all glazed. It is eight feet high up to the eaves, the south side being boards, whilst the north side is all glass except two feet of skirting. Do you think it will answer?"—In reply: 1. Willesden Green, N.W. 2. Except for its circumscribed dimensions, it will answer very well.

RESIDUES.—T. WILSON writes: "I have just collected my residues for the year. The ash from the paper, P.O.P., weighs six pounds and a half. Will you tell me about how much silver it contains? I am told that I ought to get at least two pounds and a half of silver from the refiner?"—Well, you certainly will not, or anything like it, as there is, comparatively, little silver in it. The greater part of the weight is made up of the baryta coating with which the paper is surfaced, and that is a very heavy material. Without an assay it is impossible to give even a remote idea as to the proportion of silver.

LANTERN LAMP.—LUX writes: "Last year I bought a lantern with a triple wick lamp, and it gave every satisfaction. A few days ago I unearthed it and trimmed it for an evening's show. It gave an excellent light, but the stink—for it was nothing but a stink—from it was unbearable, and the show could not proceed. Can you say how this is to be avoided, as there was no smell, to speak of, from it when used before?"—The cause, doubtless, is that the lamp is dirty from last year's oil not being out and off it before it was put away. Thoroughly clean the lamp, both inside and out, and put in new wicks, and we have little doubt it will be as satisfactory as it was at first.

BAD TREATMENT.—EMPLOYE says: "In the spring I made an agreement with a photographer, for a year, at a certain weekly salary. Last week he gave me a week's notice, as he said the business would not warrant him in keeping me on during the winter. When I reminded him of our agreement, he said he was very sorry, but could not help it, and he would give me an excellent reference. Can I not hold him to the agreement, as he has plenty of money?"—Yes, if you had a written agreement but not without, we are sorry to say. Yours is not an exceptional case with unprincipled employers. They often engage men in the spring, for a year certain, and then discharge them when the season is over.

DRYING MARKS; AGREEMENT.—COLLODION says: "1. Sometimes in drying, a line negative turns light and thin, though previously quite opaque. Process, wet collodion, intensified with lead and ferricyanide, followed by ammonium sulphide. 2. I have a three years' agreement with my employers, in the event of a voluntary wind-up, could I claim wages for any uncompleted time? In the event of liquidation I believe the firm cancel all engagements."—1. Faulty manipulation, probably imperfect washing between the different operations in intensifying. 2. If the company cease to exist, we do not see from whom you can recover. We should surmise that the agreement expires with the company.

POISONS AND TONING.—G. BRANDON asks: "1. Whether potassium sulphocyanide, ammonium sulphocyanide, potassium ferricyanide, and potassium ferrocyanide are poisons within the meaning of the Pharmacy Act? 2. Please give formula for a toning and fixing bath, which will keep for some time in usable condition in one solution. 3. In toning, can platinum be substituted for gold? If so, in what proportion, and is platino-chloride or potassium chloro-platinate the better salt to use?"—1. Neither of the salts named is specially mentioned in the schedule of the Act; it, however, says, "Cyanides of potassium and all metallic cyanides." 2. All the published formulae will keep for some time, though not for long. Better keep the gold separate, and add as required for use. 3. A formula for platinum toning is given on p. 1064 of the ALMANAC for the current year, and on p. 1096 of that for 1900.



# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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## THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1900.

Edited by THOMAS BEDDING, F.R.P.S.

THE Thirty-ninth Annual issue of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC is now published. The volume reaches the unprecedented total of 1516 pages, and is the largest yet produced. As hitherto, it is issued in paper covers, price 1s.; cloth bound, 1s. 6d.

The frontispiece is a bromide print by Messrs. Wellington & Ward, of Elstree, from a negative by Mr. H. Walter Barnett, of No. 1, Parkside, Knightsbridge. Many other illustrations are also given in the text matter.

Eighty articles, on a great variety of subjects interesting to photographers, and contributed by the principal authorities of the day, form a feature of the volume. The other sections are "Epitome of Progress during 1899," "Patented Inventions of the Year," "Miscellaneous Information," "Practical Notes and Suggestions of the Year," which, with the large collection of formulæ, tabulated matter, and a great deal of other information of use to all photographers, places at their disposal,

for constant reference, a fund of technical knowledge which is not to be found in any other photographic annual.

\* \* The 1899 Edition of the Almanac (20,500 copies) was entirely exhausted within three months of publication—a fact without precedent in the history of photographic publications.

\* \* Of the 1900 Edition just issued nearly 17,000 copies were disposed of on the day of publication: an increase of between two and three thousand as compared with last year. It is probable that the entire edition will be out of print within a few weeks from date.

## EX CATHEDRÂ.

THE distribution of our annual ALMANAC, which has been accomplished this year with unexampled rapidity, always brings us a very great number of congratulatory letters from its readers, and during the last few days tradition has been well sustained in this agreeable respect. It is a sincere pleasure to us to know that the book increases in public appreciation from year to year, and we are glad to have so many recognitions of its value to the photographic world; but, amidst the feelings of delight which the letters of ALMANAC readers have caused us, we have to own to a touch of sadness at the absence from the volume of many honoured names which death and sickness have robbed us of. Four stauncher supporters of this JOURNAL and its ALMANAC in the old days than Dr. R. L. Maddox, W. K. Burton, W. B. Bolton, and Canon St. Vincent Beechey (to name some of the more prominent absentees of this year), it would be difficult to find. Happily, the first-named is still left to us, though we are sorry to say that illness keeps the pen out of his hand; but the other three have fallen before the Great Leveller. Still the record of their work is left for us to profit by, and it is with pride we reflect on the fact that, during the thirty-nine years of its existence, the most illustrious workers in photography have given the world the benefit of their knowledge through the pages of the ALMANAC.

\* \* \*

An interesting note on the use of curved plates in Stellar photography has been published in an American contemporary,



which says that Professor J. A. Brasher has developed some of the curved plates on which he photographed the sky one night recently when the meteors were expected to appear. While the night was very bad for photographic purposes, the pictures of the stars which he obtained were excellent. He said that they covered ten times the area that was possible with ordinary plates, and the pictures of the stars were well defined and continued clear to the edges of the plates. The time and labour which were expended in preparing to photograph the meteors was not wasted, because it was shown that curved plates are the proper thing for astronomical photography and have opened up new possibilities in this field.

ONE would have thought, considering the heavy punishments that have from time to time been inflicted, that the traffic in obscene photographs had died out, but it does not seem to have done so. On Saturday two men were remanded from the Marylebone Police Court on the charge of procuring and selling books and photographs alleged to be obscene. More than one prosecution has been instituted for showing indecent "living pictures," and we were pleased to record, last week, a disavowal from the Secretary of the Mutoscope Company that some objectionable pictures that had been shown were by his Company. However, some living pictures have been exhibited at some of the music halls which, if not exactly indecent, were extremely vulgar. It is a great pity that such a thing should be, as it will tend to bring this class of picture, now so popular, into disrepute amongst respectable people. The same kind of thing obtained with the stereoscope when it was at the height of its popularity years ago, and was in a great measure responsible for its then decadence. Although not actually obscene, many of the pictures were of exceedingly vulgar character, and many ladies would refuse to look into a stereoscope, not knowing what might meet their eyes. It is to be hoped this will not be the fate of living pictures, the production of which and their exhibition is now so highly remunerative.

"DICKENS' Land," in the neighbourhood of Lincoln's Inn and Clare Market, where so many of his characters were taken from, is fast disappearing to make room for London's improvements. Still the Old Curiosity Shop is not yet touched, though it is ready for demolition. Now another landmark is in jeopardy. The Bull, at Rochester, where the Pickwickians adjourned on their first visit to that city, and where the ball took place which was attended by Mr. Tupman and his friend Jingle, and at which Mr. Jingle offended Dr. Slammer, is shortly to be sold at auction. When sold, it is highly probable that the Bull will be pulled down to give place to a more modern building. We call attention to this sale, as many photographers may like to secure a photographic memento of the old place as a reminiscence of Charles Dickens. Doubtless, the Photographic Record Association has already secured photographs of the "Bull."

STILL another accident with the cinematograph, which might have ended in a serious catastrophe, has been recorded. The account says that during a cinematograph entertainment at Farnborough, Warwickshire, "some films caught fire. The lanterns were soon blazing, and it was feared that the cylinders would explode. A panic ensued, and some people were knocked down and trampled upon, and windows

were smashed by people trying to escape." The report adds that, fortunately, order was restored, and the people escaped without serious injury. These continually recorded accidents are regrettable, as they show either gross carelessness or ignorance on the part of the operators to whom the displays are intrusted. Cinematograph shows have been given at most of the London music halls nightly for months together without a mishap, and it is noteworthy that it is only at minor entertainments that these accidents happen.

It is not from the mere blaze-up of a few films that the danger arises, but the panic and stampede that generally follow, when people are sometimes crushed to death, or seriously injured, as in the Paris catastrophe. We have from time to time been promised new films for photographic purposes to take the place of celluloid, which are not combustible, and some seem to be near at hand. But will they be suitable for the cinematograph? A film for this purpose must be free from granularity, perfectly flexible, and as transparent as the present celluloid films. If a film of this nature were available, it would be a small fortune to the introducer, for there is little question that it would quickly supersede the present combustible celluloid, and thus do away with County Council inconveniences. Indeed, if as good as celluloid, it might lead to a prohibition of its use altogether at public entertainments. Who will be the fortunate inventor of such a film?

WE give on another page a brief report of the Judge's finding in the case recently tried at the Yarmouth County Court, in which it was sought to establish the revolutionary doctrine that the right to the negative vested, not in the photographer, but in the sitter. It is satisfactory to note that his Honour decided in favour of the photographer, and thus we have a further confirmation of past judgments to a similar effect. All's well that ends well, and we are very pleased to hear that in this particular case the article we published a few weeks ago, enumerating the instances in which decisions had been given in favour of the photographer, was instrumental in enabling the Judge at Yarmouth to frame a verdict hostile to those who sought to deprive the photographer of all right in his own property.

As the following announcement may interest many of our readers, no apology is perhaps needed to our esteemed contemporary, the *Chemical News*, to whose columns we are indebted for the information: "At the University College, London, a course of eight lectures dealing with the methods of spectroscopy, especially in connexion with the photography of the spectrum, will be given by Mr. E. C. C. Baly, on Friday evenings, at 5.30 o'clock, commencing on January 19, 1900. Fee for the course, one guinea. The following subjects will be treated and illustrated by experiments: The simple theory of refraction and diffraction; the history of the determination of the modern standards of wave-lengths; the prism spectro-scope and its integral parts; the comparison of spectra and determination of wave-lengths visually and photographically with prism apparatus; the grating spectro-scope. Rowland's concave gratings, their mounting and adjustment; the determination of wave-lengths with the grating; photography of the spectrum; methods of producing emission and absorption spectra; fluorescence and phosphorescence."



## THE METRIC SYSTEM.

THE Secretary of the Decimal Association has just issued a list of Board schools in England and Wales that approve of the metric system of weights and measures being taught in the schools under their control, and generally in favour of the introduction of the decimal system into this country. The list comprises eighty-eight Boards, the total population which these bodies represent being over ten millions. This certainly seems very hopeful for the advocates of that almost universal system abroad.

The metric system is making, though somewhat slowly, progress amongst photographers, and many of our dry-plate and paper-makers are helping it by giving formulæ under both the old and metric systems. What somewhat retards the adoption of the system here is the dealers not putting the weights and measures on the market at similar prices to those charged for them according to the English system. But there is no reason why that should be so. The one costs no more than the other to make. The measures, by the gradulators, are charged according to the number of graduations, and not according to the system, whether drachms or c. c. Furthermore, as we have pointed out before, for a slightly additional cost, one set of either weights or measures may be made to serve for both systems.

We have a set of three glass measures graduated on both sides, one according to the metric system, measuring from 1 c. c. to a litre on the one side, and from 10 minims to the quart on the other. The cost of these was the same as the ordinary measures, *plus* that of the extra graduations *pro rata*. We have also a set of weights with which we can weigh from one centigramme to three hundred grammes—about ten ounces; these in a box, with a receptacle for each weight, from the gramme upwards, and the smaller ones in a closed nest by themselves, which cost about four shillings retail. They are of Continental make and are very accurate. On these we have stamped, with a punch, their equivalents in English grains and ounces. Thus we have one set of weights and one set of measures that serve for both systems. If the dealers would put similar weights and measures on the market at popular prices, they would, doubtless, find the business remunerative, and they would certainly help to make the metric system, by which all Continental formulæ are given, universal amongst photographers.

We might here remind our readers that, in order to lend practical support to the progress of metrology, we have for the past two years expressed most of the formulæ given in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC in metrical as well as Imperial equivalents. Of that course many expressions of approval have reached us, and we have also noticed that some of the dry-plate manufacturers who had not hitherto done so have since sent out their formulæ dually expressed—a course that must be found convenient by many foreign photographers.

In the ALMANAC which has just been published we have some further remarks on the needless difficulties which hamper the adoption of the metric system, and we have thought that the reproduction of the substance of those remarks in these pages would not be inappropriate, as they might attract additional attention to the matter.

In the ALMANAC article we appeal for help in securing the general adoption of metric units to dealers both wholesale and retail, and we point out that many of the former class are agents for foreign firms who supply some of our most generally

used chemicals, whilst others are necessarily chemists themselves, and these are familiar with the metric system, even when they do not use it in their business. The weights and measures used by photographers are largely made abroad and imported, and there ought to be no difficulty in getting one sort more than the other.

We further remark that, as regards weights, indeed, there is practically no difficulty if the purchaser is content to wait a few days, but there is some as regards measures of capacity. Those which are most generally offered, as far as our experience goes, are narrow and cylindrical, and are not suited to the wants of photographers; they are too tall for their bases, and hence are easily knocked over in a dark room, and they are, besides, difficult to clean satisfactorily. A photographer, too, does not want the same accuracy in all parts of the scale; small quantities require to be measured with more accuracy than large, and all ends are best gained by a conical form of measure, rounded at the bottom for facility of cleaning. Corners and projecting portions should be carefully avoided, especially such small hollows as if from broken bubbles in the blowing of the glass, which defects we have met with. If retail dealers could bring themselves to keep a small stock of these articles, and place them conspicuously on view, adding to the numerous placards in their shops one calling attention to them, they would help greatly to popularise them; some, indeed, we hope, would go further, and explain the advantages and convenience of the system to their customers.

So much for the means of apportioning the materials when we have got them; but there is another way in which help may be given. It may be thought that it is easy to weigh out any portion from a bottle, and that it does not matter how much the bottle contains. This is not quite the case, however. Some chemicals are so bulky that it is difficult to weigh them; others are liable to deteriorate rapidly when a partly used bottle is left for some time. Pyro, for instance, which is so generally used, is open to both of these remarks. Of course, ingenuity overcomes the inconvenience of weighing, but recently a search for a convenient holder for performing this operation was unsuccessful. Practically, pyro is only available in England in ounces, and many formulæ for its use are so given as to need no break of bulk. Now, an ounce contains 28·4 grammes, and it is quite certain that the foreign producers do not put up this chemical in ounces for home consumption, nor do they use the ounce in their manufactories; they have simply suited themselves to the market they desired to reach, and what was recently the English law. Now that the use of metric units is legal, it is to be hoped that pyro and other chemicals will be made available in such parcels as are used abroad, and that such will be available in dealers' shops. An example shown by some of the large dealers would soon be followed. At first, no doubt, the demand for such parcels might be small, but the cost of keeping a small stock of weights or measures and chemicals in convenient bulk for use with metric formulæ would not be great. Our photographic schools, too, might do a great deal to push the use of the common-sense formulæ on the metric system.

Finally, we urge on those who communicate formulæ for the ALMANAC (and this also applies to the JOURNAL), that they should give their proportions for a litre of solution. Apart from convenience of comparison, there is the great facility for making just what quantity one requires, which is singularly wanting in many of the recipes.



We have reached the limits of space assigned to this article, but we shall recur to the subject. If we can be instrumental in persuading all photographers to use the metric system, and the trade houses to supply the proper weights and measures, material assistance will have been given towards its general adoption.

**Induced Radio-activity.**—M. and Madame Curie are still pursuing with ardour their investigations into the radio-activity of the hitherto unknown body they have extracted from the uranium ore, pitch-blende. They have recently communicated to the Academy of Sciences a paper describing a remarkable and unexpected property possessed by the radiations—a power of inducing radio-activity in a variety of other bodies submitted to the radiation from polonium and radium. These substances are powdered and placed on a horizontal plate, and a few millimetres above it the material to be tested, placed on supports. In this manner the substance is proved to become impregnated as it were with the radiative effluve, and for several days the intensity diminishing rapidly, but not disappearing entirely for some time. It was necessary to use very strongly radio-active material, that employed by the investigators being from 5000 to 50,000 times more active than uranium, which, it will be remembered, was the substance to which attention was first drawn by Becquerel for its radiating power. In the present investigation the aim was to discover whether the induced radio-activity was to be attributed to vapour or powder thrown off from the originating body on to the induced matter, but though arguing from analogy such emission was to be expected, yet the conclusion arrived at was that the result was actually owing to induced radiation, and not to transference of radiating matter. The final experiment, which seemed conclusive, was made by enclosing the polonium or the radium material in a metallic box with a thin aluminium bottom, and then placing plates of the various substances in external contact with the aluminium. The plates became endowed with a radiative power from ten to seventeen times greater than uranium, a radiation entirely different from the secondary Röntgen radiation, which ceases the moment the Röntgen rays are prevented from striking the emitting body, while with the new property under discussion, the radiation persists, as pointed out, for days.

THE question naturally arises, Have M. and Madame Curie separated a new element or new elements, or not? and, to answer it, M. Eugene Demarcay has, in a paper published in the *Bulletin* of the French Chemical Society a paper describing the results of a spectroscopic examination of several specimens sent to him. The first received had a radiating power 70,000 times that of uranium. In the photographic spectrum obtained he finds a series of new lines quite as strong as the strongest of those from the accompanying barium, and ten other fainter lines, so faint as to render their origin doubtful, so that, before publishing them, he would prefer to wait till he obtains a still purer form of radium.

**The "Missing Star Shower."**—From some highly interesting letters in *Nature* last week it would seem possible that the expected meteor shower may actually have occurred, after all, but in the daytime. Professor N. Story Maskelyne first heard of the observation in Wiltshire, and asked the observers to put in writing their own descriptions of the phenomena they witnessed. The three letters are published. They are all from what may be termed one party of casual observers, but they really appear to have seen, and through a slight mist, an immense number of falling stars. A fourth extract from a letter is from another quarter (in Essex), and describes a similar appearance.

NEVERTHELESS, many astronomers hold the opinion that the stars which should have appeared the middle of last month may be expected in November of 1900 or 1901. It is calculated from the descriptions given that these daylight-seen meteors could not have

been Leonids, seeing that the constellation of Leo would have been well below the horizon at the time, while the observers coincide in stating that the meteors seen all appeared to start from one point.

IN view of their possible appearance next year, it may be well to note that any camera observers can add very much to the scientific value of their negatives if they obtain spectrographic trails by a simple addition possible—merely a prism or a diffraction grating, which, as *Nature* states, can now be purchased, of practically perfect make, very cheaply, of sufficient size to cover the lenses of ordinary cameras. After the camera has been focussed, the prism or grating can be very simply attached to the hood of the lens, the whole then constituting a small prismatic camera, which will give the spectrum of any meteor whose image falls upon the plate.

### THE NASCENT SILVER THEORY.

[Translated from the *Photographische Correspondenz*.]

A LIVELY exchange of opinions has recently taken place concerning the theory of the formation of the invisible (latent) developable image, brought about by exposure of silver bromide to light. The silver sub-bromide theory advocated by me, amongst others, was attacked, and an attempt was made to set up in its place the idea of the primary formation of nascent metallic silver (nascent silver theory). I entered several objections, and in various articles, which appeared in this periodical, I supported the silver sub-bromide theory upon the ground of demonstrated, experimental facts.

Professor Abegg, the principal advocate of the nascent silver theory, now finally concedes, in an article upon this question,\* which appeared in the *Physikalische Zeitschrift* (vol. i., 1899, p. 32), that the nascent silver theory, by itself, is insufficient to explain the whole of the photographic phenomena, and thinks that the experiments "clearly permit the possibility of a combination of both theories."

Professor Abegg is therefore in complete agreement with the view I entertained more than ten years ago. I might be satisfied with this but for the fact that the researches I have recently made, in consequence of this discussion of the question, have led me to further divergences from Professor Abegg's opinions. At the present time I find it impossible to attribute to the nascent silver theory, even in the sphere of secondary action, that marked influence in the formation of the developable latent image which I formally thought might be the case.

I was then of opinion that the primary latent image consisted of sub-bromide, which formed metallic silver under the action of the developer. The metallic silver in contact with silver bromide then caused further noticeable reduction of metallic silver. This, in addition to the first process, I considered of great importance. Professor Abegg was of opinion that nascent silver was the sole cause of the formation of the latent image, but he now abandons the idea and returns to my old conception, which he at first contested; but recently I have had to recognise that this action by contact, upon which Professor Abegg sets special importance, is quite secondary. Spectrum photographs, taken with optically perfect spectral apparatus (concave gratings) giving fine definition, have convinced me of this. Multitudes of closely crowded, perfectly sharp lines may thus be photographed, which, upon development, attain considerable density without spreading laterally in the same degree. This is proof that contact action exerts less influence than the penetrating energy of light.

However, I think much has been gained, if the untenable nascent silver theory has at least been partially abandoned by its originators. Efforts are now being made in the *Archiv für Wissenschaftliche Photographie* to save the "nascent silver theory," at all events in name. The publication now uses the expression "nascent silver" (vol. i. p. 109) to indicate generally the substance of the latent image, whether the idea be that of sub-bromide or metallic silver.

I think it is inexpedient to include in this manner under one collective name two distinctly different ideas. Nascent silver and the theory associated with it were at first used in distinct opposition to the sub-bromide theory.

The proof of the untenable nature of the theory should not be made the ground for applying the term "nascent silver theory" to some other thing which may be more easily defended. The nascent silver theory

\* In the paper Professor Abegg overlooks the fact that meanwhile the indestructibility of the latent image has been proved in connexion with gelatino-bromide of silver as well as collodion.



comprehends such a clearly defined photo-chemical idea, that it is inadmissible to give the name offhand a different meaning.

Whether the nascent silver theory be false or true, the name is attached to a certain opinion, and it is contrary to the necessary precision of language to change meanings without adequate reason. If the "nascent silver theory" cannot be sustained, we should abandon the use of the term "nascent silver" for the denotation of something which differs from its original meaning.

DR. J. M. EDER.

#### RODINAL AS A DEVELOPER.

Of this particular developer more has been used in my own practice since its introduction than of any other developing agent, although it is by no means the only one I use, for, indeed, there are but two of the late introductions, diogen and kachin, which have not been tested, and tested as I prefer to test any such matter, not by using it on two or three specially exposed plates, and upon the results basing one's opinions of its usefulness or otherwise, but by making up some amount of it in stock solutions, and employing it for plates, exposed in the ordinary manner, out of doors, and under such conditions as one's work is mainly undertaken under, and continued over some reasonable length of time; for, however clever a photographer the experimenter may be, it is impossible to pick up and at once employ any strange reducing agent with the same facility as those which constant use has given complete control over. The more is this so when any radical change has been made either in the manner of its working or nature of the resulting negatives given.

Each new developing salt introduced to us comes with its accompaniment of high-strung praise over its wonderful qualities, then a few letters, and, it may be, one or two articles appear, followed later by the usual crop of complaints. So was it with Rodinal, but its chief, if not only, sin seems to lie in some supposed difficulty to obtain dense negatives. No greater mistake could be made, for density may be built up as readily with it as by any other developer, if it be desired and means taken to ensure it.

What I like about it in particular is the simplicity and readiness with which any variation is possible, for, being highly concentrated, and in one solution, at a moment's notice either negative-making, bromide enlargements, or lantern slides may be dealt with, the only difference being a more copious dilution with water of this developer is advisable when paper or slides are being treated than when making negatives, with regard to which, by the way, some considerable correspondence lately has been carried on in the photographic press relative to that highly important topic. Should a developing solution be used more than once? It produced some interesting and certainly amusing reading, one side holding, with true British doggedness, that, after once having done its work on a plate, a developer should be consigned to its resting-place, the dark-room sink, while others asserted the contrary, and for a time right merrily waged the wordy warfare.

To me it was intensely amusing, for just about the time I had five dozen exposed plates awaiting development, and hitherto it had been my practice, when anything like a batch of, say, one dozen or more were dealt with at the time, to mix up my developers, and proceed gaily to pass one plate after another through, until either the whole batch were finished or development became slower, when the addition of ten or twenty minims from the stock bottle set matters going briskly again. Such had been my practice in a general way, and, in spite of the woes and evils supposed to follow such a practice, past experience seemed to justify the risk, and four dozen exposed plates were in one evening transformed into forty-seven decent, respectable-looking negatives, most, if not all, of which possess some measure of success, if Mr. Chapman Jones's definition of that desirable article, the perfect negative, be a correct one, viz., that it is pure silver in clean gelatine, for all through the series of twenty-three whole-plates and twenty-four quarter-plates. So far as diversity of subject, exposure, and so forth would allow, they presented a uniformity of colour, density, and general good quality which left little to be desired, and certainly no cause of complaint; yet for this batch I had used the selfsame solutions right through, with only, as already pointed out, one or two additions from the stock solution to revive its developing action.

Some slight discolouration necessarily takes place when a number of plates are passed through the same developer, whatever it may be composed of; but, with rodinal, and indeed pretty nearly any of those reducing agents of kindred nature, this appears to have no detrimental effect upon plate or film submitted to its action, which is certainly not the case when pyro is employed; and where this particular developer, pyro, is the one used, there can be no doubt of the better plan being to treat each plate with a freshly made solution, for the simple reason oxidation quickly transforms a pyro developer into a dirty, muddy concoction, unless a large percentage of sulphite has been employed as a preservative.

One reason why difficulty arises, when developing plates with rodinal, to obtain ample density, is because, as a rule, it is used considerably diluted, and time is not allowed for it to build up sufficient density, which, by the

way, is done somewhat slowly, if the developer is being used weak, where, for any reason, exposed plates are first treated with dilute rodinal, after such detail has been brought out as may be thought desirable, density may rapidly be obtained, either by adding rodinal from the stock, or transferring the plate to another dish containing one part of rodinal to ten or fifteen parts water, to which has been added sufficient potassium bromide to hold in check its action. In this manner density may be obtained quite as quickly and effectually with this developer as when employing any other. In the same way, where plates submitted to it are found to have been much over-exposed, they may likewise be transferred to the strong and restrained developer just referred to, when development will proceed more correctly, and the results should prove quite satisfactory.

On the other hand, where either excessive contrasts in the subject itself or brought about by insufficient exposure, having been given the plate, the effects of this evil may be much reduced by employing a developer considerably weaker than normal; for instance, one part of rodinal may be added to sixty or ninety parts water. A batch of plates may then be submitted to it, and practically we have "stand development," for which I have found nothing more convenient when dealing with small sizes, such as quarter-plate, than one of the glazed pot tanks sold by all dealers, and used for fixing or aluming negatives in. A dozen plates may then be treated at once by placing them in the grooved tank, with sufficient of this dilute developer to cover them; then a tray or lid, or, indeed, anything, being placed over the tank, one may go about other matters and feel perfectly certain no harm is likely to occur if, from time to time, examination be made, and such negatives as have progressed sufficiently be fixed and washed in the usual way. One matter, however, should not be forgotten, plates developed with this or similar reagents are rather deceptive as to density, and need to be carried apparently further than where pyro, or even hydroquinone, has been used. So also, for some reason or other, when developing in the manner just referred to, they are better for being carried slightly further than when developed with a solution of normal strength. Curious as it seems, the fact remains, and should be noted when commencing stand development.

Used for developing prints on bromide paper (contact or enlarged), it gives pearly greys and good rich blue-black, while for lantern-slide work it needs development carried very far indeed before the shadows become blocked, when the developer is used reasonably dilute, say 1 in 40.

A curious effect was noted some time back while making a series of lantern slides, many of which were given full exposures, and so developed as to get the brightest red colour possible. The plates were Paget's slow, and, having towards the end become rather weary, I hurried up development of the last ten or twelve slides by adding a few drops of rodinal to the slow-acting developer in which they had been. The small transparencies at the moment under treatment were very red in colour, but after the slight addition of rodinal it rapidly cooled down to a pleasant brown, and having several duplicate exposures, by varying the amount of rodinal added to the developer, specially intended to produce a maximum warmth of colour, showed that, as it was added in greater or less quantities, so did the vivid red slide rapidly alter in colour, and, if pushed by the addition of much rodinal and allowed time, they seemed to turn to a rich warm black. Some of the resulting slides treated in this manner turned out a beautiful rich warm sepia, while others, having had just the same lengthy exposures, but developed straight away in rodinal, gave a warm black image, and I can well imagine, to first partially develop for bright red colour, then cool it down, by a brief immersion in rodinal developer, would prove a useful method of obtaining any desired warmth of colour between black and red entirely by development, with considerable certainty and in a speedy manner.

A commendable feature also about this developer is its sociability, for it will mix with and work in conjunction with any other developing agent I have used, and, from its all-round usefulness, should find a place on the shelf of every practical photographer, be he professional or amateur.

W. THOMAS, F.R.P.S.

#### HINTS ON BROMIDE PRINTING.

BEFORE the members of the Leeds Camera Club, on Wednesday, December 6, a lecture was given by the Rev. W. H. Dick, of the Manchester A.P.S., on the subject of "Bromide Printing." The lecturer first dealt with the negative, and told his audience that if they made up their mind to print in bromide—one of the most useful processes at this season of the year—it was imperative they should also make up their mind to produce a suitable negative. By a series of diagrams he showed how a negative of many degrees of density, from opacity to clear glass, must act, that the ideal negative should have its deepest shadow printed black when its highest lights were just beginning to degrade, and not before. In some forms of printing a different range was necessary, but, for the best class of bromide work, he might liken the gradations of the negative to the keyboard of a piano, taking all the upper and middle scales, but leaving out those of the base. The production of such a negative was clearly demonstrated, showing that a weaker developer than usual ought to be adopted, and, though every detail and gradation were relative in a properly exposed and developed plate, yet the light was able to pass through these gradations and correctly represent them. Following on to the



printing he advocated the use of the oxalate and iron developer, and, though its use necessitated the clearing acid bath, yet it was capable of producing the best work, and with considerable control, and this could be adapted to suit the particular class of negative. By a series of prints he showed that, with a light at a uniform distance, exposures of  $1\frac{1}{2}$ , 3, and  $4\frac{1}{2}$  seconds produced, with a given strength of developer, certain results; while with exposures of 3,  $4\frac{1}{2}$ , and 6 seconds, and a weaker developer, a different result was obtained, for, while the  $4\frac{1}{2}$  seconds in the first set clearly indicated over-exposure, the 6 seconds in the other set was about equal to the one of 3 seconds in the first.

The extremes in the making up of the developers were for the first:—

Saturated sol. oxalate potash .....	4 drachms.
" iron sulphate.....	1 drachm.
Ten per cent. sol. potass. bromide .....	1 drop.

For the second—

Saturated sol. oxalate potash .....	12 drachms.
" iron sulphate.....	1 drachm.
Ten per cent. potass. bromide .....	3 drops.

Of course, any modification between these two could be adopted, and the lecturer recommended them to make trial exposures on a given negative to determine for themselves which gave the best result, and make a note of it. Then, by comparison with that negative, any other could be dealt with later, and they would have some certainty of producing results which, if not absolutely equal to platinotypes, certainly came very near them; while as to permanence, he could show them prints of four years ago which had not altered in the least.

#### AN IMPROVED FERRO-PRUSSATE PROCESS.

We append the principal details of Mr. A. F. Hargreaves' method of producing modified "blue" prints upon cotton, linen, paper, or other suitable textile fabrics.

The designs, says Mr. Hargreaves, are fixed upon any of the above-mentioned materials by the deposition or precipitation of a pigment, lake, or colouring matter heretofore unknown to the art and science of photographic printing.

The pictures produced are unchanged by exposure to sunlight, are novel and beautiful in colour, and will stand a boiling soap solution.

This invention dispenses with the use of any of the salts of gold, platinum, silver, or other precious metals so much used in photography, and is a development or extension of the well-known ferro-prussiate process.

Two chemical substances, ferric ammoniac citrate and potassic ferri-cyanide, are each separately dissolved in water, in about the following proportions:—140 to 175 grains ferric ammoniac citrate in 3 ounces water; 120 to 160 grains potassic ferri-cyanide in 3 ounces water. The above solutions are then mixed.

The solution of these two materials is brushed over a piece, say, of bleached cotton cloth of any required size, or the pieces of cloth may be dipped into the solution, the operation being done in a dark place.

The excess of solution is now pressed out by means of, say, pressing rollers or any other suitable method, and in this condition the sheets are carefully dried in the dark.

The sensitized sheets are now used for printing in the usual way known to photographers and engineers from photographic negatives or drawings made on thin transparent paper or cloth. After printing, it is only necessary to wash out the unchanged or soluble material by means of water, whilst the changed portion which is blue, being insoluble, remains.

It is important that the blue prints should be well washed in water in order to eliminate all unchanged chemicals; and, in order to do this more effectually, I may digest them in a dilute solution of hydrochloric acid, and afterwards well wash in pure water.

As stated in my provisional specification, I make no claim whatever to the above process, but use it or its equivalent for the purposes of my invention, which, though dependent on having this photographically produced blue print as a starting point, is a distinctly after-process.

Now, the essence of my invention consists in utilising the iron contained in the blue colouring matter as above produced by actinic light, and making it the medium or base for the formation of another colouring matter, which is more intense, beautiful, and permanent.

In other words, I use the iron in the blue as a mordant in the same way as calico-printers purposely fix oxide of iron on cotton cloth as a preliminary in the dyeing of purples, blacks, greys, &c.

When cotton cloth on which there has been fixed an oxide of iron is subjected to certain dyeing materials, such as alizarine or logwood, purples and blacks are produced, the first-named material producing a well-known and highly esteemed coloured lake known as madder or alizarine purple, and is one of the most permanent colouring matters known.

Now, my chief novelty consists in utilising the fact that the blue colour referred to, being an iron compound, acts as if oxide of iron alone were fixed on the cloth, and it can therefore be used as a mordant, or, in other words, as a basis for the formation of purples and blacks.

For the purposes, therefore, of my invention I use a photographically produced blue print on any suitable material, though I prefer cotton cloth.

The blue prints are subjected to the action of a dye bath containing any or all of the following dyeing materials added to a considerable volume of water: madder, alizarine, purpurine, or logwood.

The blue prints are preferably entered into the dye-bath at a temperature of about 100° F., and the temperature gradually raised in thirty or forty minutes to the boiling, and agitated during the whole time. They are then well washed in clean water, and afterwards treated to a boiling soap solution. They are then well washed, dried, pressed, and (if desired) starched, and mounted in any desired manner.

It must be understood that, in mentioning the three first-named materials, I may use any preparation or modified form thereof. For instance, madder is a root of a plant called *Rubia tinctorum*, and contains alizarine and small quantities of purpurine, but it has been almost entirely displaced in the arts by artificial alizarine; notwithstanding this, it may in some cases be preferable to use it and certain preparations therefrom, such, for instance, as garancine, which was formerly prepared from madder in large quantities.

In the same manner there are certain modified forms of purpurine, such as flavo-purpurine, any of which I may use. In fact, alizarine of commerce contains more or less of all these materials.

According to my most recent experience, I prefer to use commercial alizarine containing this material in its purest form.

#### GRAVURA PLATES AND PAPER

BEFORE the Gospel Oak Photographic Society, on Tuesday, December 5, Mr. Baldwin, representative of the Paget Prize Plate Company, demonstrated to the members of the above Society the capabilities of the Gravura paper, lantern plates, and opals, manufactured by his firm. At the outset of his demonstration, Mr. Baldwin made a few remarks relative to the chief characteristics of these materials, from which it appeared that they were of the "gaslight" development order, that is to say, that all the operations connected with the production of lantern slides or prints could be conducted in an ordinary room, lighted by gas, thus dispensing with the dark room and ruby lamp, which was necessary when using ordinary bromide paper or lantern plates. The chief advantage of the paper lay in this fact, but there was another important consideration which was not to be lost sight of, and that was the ease with which colours could be obtained on either paper or lantern plates, ranging from cool sepia to red chalk. These were obtained by increasing the exposure beyond that required for black tones, and at the same time using the developer very much diluted and restrained, and in the case of the warmer tones, using in conjunction with the diluted restrained developer a solution of ammonium carbonate. It was the invariable rule that, the warmer the tone desired, the longer should be the exposure, and the weaker and more restrained the developer. For black tones, however, the concentrated or normal developer should be used without the addition of ammonium carbonate.

Regarding the exposure required, nothing definite could be said, as this would vary with the source of light, character of the negative, and distance between the two. As to the source of light, for amateur use nothing better could be wished for than magnesium ribbon, though for black tones ordinary gaslight would answer, the protracted exposure required for the warmer tones somewhat putting it out of court when these were desired. For the professional photographer the incandescent gas light was the cheapest, and two large-size burners would be ample. As a guide to the exposure necessary, it might be mentioned that one or two minutes might be given with a negative of average density at a distance of about four inches from an ordinary gas flame, or from half an inch to an inch of magnesium ribbon burnt at about 12 to 18 inches from the negative. Hard negatives would require to be nearer, soft negatives further from the ribbon or gas flame; this distance was only approximate.

If warm tones were required, then the quantity of magnesium ribbon might be increased from  $2\frac{1}{2}$  to 5 inches (according to the colour required), or the exposure to the gas flame increased to from ten to twenty minutes.

The developer, which was recommended by the makers of the paper, and which had been found to give the finest result, was a metol-hydroquinone one made up as follows:—

Hydroquinone .....	35 grains.
Metol .....	14 "
Soda sulphite .....	1 ounce.
Soda carbonate (crystals) .....	$1\frac{1}{2}$ "
Potass. bromide .....	20 grains.
Water to make up to .....	29 ounces.

This was the normal or concentrated developer for black tones.

The ammonium carbonate solution, previously referred to as used when warm tones were desired, was prepared as follows:—

Ammonium bromide .....	1 ounce.
Ammonium carbonate .....	1 "
Water to make .....	20 ounces.



The developer for warm tones might vary, as in the following :—

FOR COOL TO WARM SEPIAS.

Concentrated solution .....	1 ounce.
Ammonium carbonate solution .....	.50 to 60 minims.
Water to make .....	60 ounces.

FOR WARM BROWNS TO REDS.

Concentrated solution .....	1 ounce.
Ammonium carbonate .....	½ "
Water to make .....	8 ounces.

FOR RED CHALK.

Concentrated solution .....	10 ounces.
Ammonium carbonate solution .....	½ ounce.
Water to make .....	20 ounces.

The lantern plates required no alteration of the developer for black tones, but, where colours were required, the quantity of water to be added to the developer should be only one-half of that required for prints. With this exception, the manipulation was exactly the same. The opals were to be used exactly the same as the paper.

One point not to be overlooked was the difference in the time of development. For black tones this might be only about thirty seconds, but in the case of red chalk it might amount to five minutes, or even more.

At the conclusion of his remarks, Mr. Baldwin exposed and developed prints, lantern slides, and opals, showing the full range of tones which might be obtained, the beauty and simplicity of attainment of which was very much admired by the members present.

In answer to questions, Mr. Baldwin said that Gravura, like all other papers, was capable of the finest results only when used with negatives which suited it best, which in this case should be of a soft character, with plenty of detail in the shadows. As to the permanency of the process, it had only been on the market for such a short time that nothing could be said from the practical aspect, but in theory everything was in favour of its being quite permanent.

## FILM PHOTOGRAPHY: THE LATEST PROCESS.

The latest process of film photography is due to Mr. Albert Hofmann, of Cologne, who gives the following description of it :—

Smooth, well-gummed, even baryta-weighted or similarly prepared papers, or woven materials, or other flexible bodies serving the purpose, are coated either on one side or both sides with substances soluble in alcohols, ethers, or benzines, such as resin alone or in combination, but at all events not made brittle, but softened through being dissolved in fatty oils or turpentine. The best results are obtained with simple solutions of shellac, gum sandrac, or mastic, with the addition of fatty or drying oils, *e.g.*, castor oil, also with turpentine or the common pine-tree resin, with suitable additions to make and to maintain the product soft and ductile.

Just as good are the soluble albuminous bodies of cereal origin, such as vegetable gluten.

After this film is taken up and is dried on, one applies a gelatine coating, to which is added a hardening medium, alum, chrome alum, or the like. With a suitable concentration, one can get a sufficiently thick coating in one operation, otherwise one must repeat the operation often enough to give the final product the requisite strength, in order that it may act as independent negative without any later strengthening. Under certain conditions, gelatine can be applied to both sides of the paper, and, after being dried, coated with a layer sensible to light, whereby it is rendered serviceable for using on both sides. In this case the original paper must be blackened. The laying on of the sensitive sheet is accomplished in the well-known manner, as well as the development, fixing, and washing of the negative after exposure.

Before the negative is dried, it is placed for a few minutes in a spirit bath, after which the paper easily loosens itself from the foundation. In order that the separated negative may be hardened and softened, it is now immersed in alcohol containing five per cent. of glycerine and five per cent. of formalin.

The film coming out of this alcoholic glycerine bath is then dried, suitably pressed on to a scrupulously clean glass plate, varnished, and copied, exactly like every other negative.

It can, however, be used as an independent film, without transfer to a glass plate.

## A ROLLER-BLIND DARK SLIDE.

MR. HENRY MAJOR has submitted to us a model of a dark slide of novel construction.

In place of the ordinary rigid shutter a blind passes over rollers. It has an aperture for the insertion and exposure of the sensitive film, the blind being operated from the back by a small projection, or cord, moving with great ease, and the whole being encased in aluminium.

The slide can be made square with scarcely any increase of size, and, used with a square focussing screen, obviates the employment of a reversing back.

A feature of the slide is the extreme rapidity with which the change from focussing to exposure is effected. This might render it useful to portrait photographers, as they can by one rapid movement displace the focussing screen and expose the plate.

The operating part can be drawn sideways, upwards, or downwards, according to circumstances, the latter movement being an advantage in the larger sizes, when it is often difficult to draw a shutter upwards.

It can be easily and inexpensively adapted to any camera or used with an adapter devised by Mr. Major, which, dispensing with a focus cloth, has a focussing chamber which reflects the inverted image right side up. The focussing screen is fixed on springs which automatically keep it in register. The focussing chamber and screen open outwards for the insertion of the dark slide, which drops easily in, and, the back being closed again, the spring screen holds the dark slide in position, the only part of it remaining exposed being a small projection at the back for operating the blind. The danger of light getting between the camera and the dark slide, and between the draw-out shutter and the plate, is entirely overcome.

Another form of focussing chamber consists of a collapsible spring, which moves outwards on opening the back of the camera, and has a hooded aperture for viewing the screen.

It is claimed for this dark slide and adapter that, for quickness of focussing and exposure, it nearly approaches the non-focussing snap-shot camera; that there is no danger of shifting the camera when inserting or removing the dark slide, or exposing the plate, or of partial exposure, or of partly removing the slide when exposing.

The whole system is clever and practicable, while the roller-blind dark slide is singularly compact, neat, and ingenious.

## A NEW PRINT-WASHER.

THIS has been invented by Mr. G. T. Harrison, who employs an ordinary metal body or barrel, A, which he mounts on a suitable stand, B. The feed water inlet consists (see figs. 1 and 2) of a series of holes or perforations, C, which extend along the bottom of the barrel, A, from end to end, and are inclined so as to produce a rotary movement of the water within the barrel.

The waste-water outlet consists of a parallel series of holes or per-

FIG. 1.

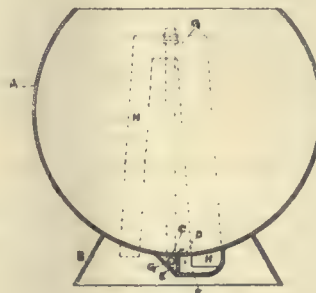
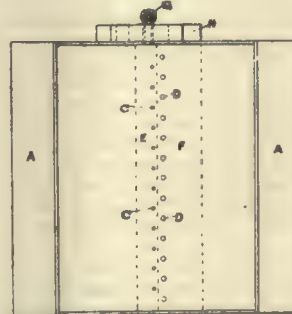


FIG. 2.



forations, D, which are preferably slightly larger than the inlet holes, C. The two series of holes run closely parallel, the inlet holes, C, and the outlet holes, D, being preferably arranged at alternate intervals (see fig. 2), so that the rush of water from each inlet hole passes between the adjacent pair of outlet holes, so dislodging any print having a tendency to settle



over the outlet holes, *n*. By this means the outlet holes, *n*, cannot become choked by the prints as they are carried round the washer.

Separate inlet and outlet conduits, *m* and *r*, in connexion with the inlet holes, *c*, and outlet holes, *n*, run longitudinally beneath the barrel,

FIG. 3.

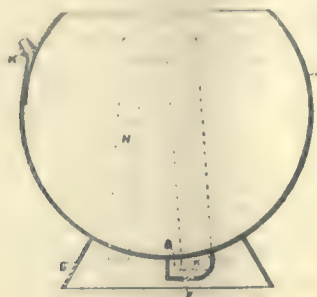
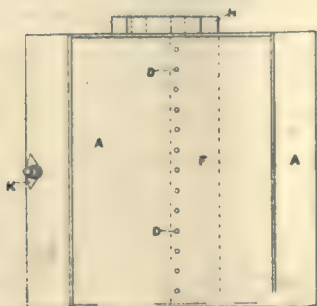


FIG. 4.



*A*, the inlet pipe, *c*, being preferably carried from the top of the washer, and the outlet being siphoned over at *n*, so as to discharge at the bottom and so prevent splashing.

In place of the inlet holes, *c*, a fan feeder, *k* (see figs. 3 and 4), with a semicircular opening to the inside of the barrel, *a*, may be employed. In this case the pipe, *c*, and inlet conduit, *m*, are dispensed with.

As the interior of the washer forms an unbroken curved surface with no projecting parts, the prints or plates are therefore not liable to damage during the washing operation.

#### PERMANENT ALBUMEN PRINTS.

MR. D. BACHRACH, in an American contemporary, gives the following method of obtaining black tones on albumen paper:—

Take the regular albumenised paper supplied to photographers, not thicker than the ten kilo Rives (the single albumen is better than the double-coated), and immerse it in a silver solution of the strength usually employed for floating it, for about the same length of time, and dry it. Fume with ammonia precisely as with the regular process, and then print on the back. If the paper is free from albumen spots on the back, a plain paper print of the very finest quality is the result. I recommend a silver solution about sixty grains to the ounce in strength.

To tone the same, if a rich, warm tone is desired, use the usual gold toning bath considerably weaker than that used for albumen paper. It must be remembered also that the depth of printing and the washing before toning must be the same as for albumen prints. The most important part, however, where failure has most often resulted, consists in the thorough fixing of the prints. A solution of hyposulphite of soda from six to eight ounces to thirty-two ounces of water, fresh every day, and fully twenty minutes' immersion therein, with frequent moving, followed by an hour's washing in running water or frequent changes in still water, will, if faithfully carried out, ensure prints almost absolutely permanent, and even less liable to deterioration in the whites than platinotypes.

Should pure black platinum tones be desired, the first toning to the warm black must be followed with the platinum bath, precisely as with the Aristo platino paper, only a stronger solution is required. In that case, however, the prints should be immersed in water made slightly alkaline with soda, and then rinsed or washed a short time in clear water before fixing. The prints thus treated are the most permanent of any prints excepting platinotypes and carbons that I know of, exceeding the former in the permanence of the whites.

We have here a process capable of yielding a wider range of tone and

individuality than any of the methods at present in favour, and the prints by this method have the additional advantage of giving an excellent surface, one peculiar in its advantages, for the colourist, by reason of its albumen backing. The print is really all through the body of the paper, and is practically indestructible by the ordinary elements. There are many advantages in this method that will commend themselves to the photographer, which it is not necessary to mention, and which will become apparent to each one by constant use.

In connexion with platinum toning I wish to state that photographers are wasting a good deal of money in purchasing the platinum toning solutions sold under various names, which are not a whit better than the formulae published in the journals time and again. A fifteen grain bottle of the platinite salt costs forty-five cents, and will tone as many prints, as uniformly and with the same character of tones as the eighty cent and one dollar bottles of the prepared solutions. I have had a number of them analysed, and this is about or near what they were found to contain:—

Chloro-platinite of potass. ....	15 grains.
Citric acid.....	72 "

An improvement is made if about fifty grains of common salt are added to the above and all dissolved in one or two ounces of water. This will keep indefinitely, and a small portion can be used and diluted with water for each batch of prints. It will be at least a good practical lesson to try this process of printing, if nothing else is gained.

#### A NEW SYSTEM OF ELECTRIC LIGHTING FOR PORTRAITURE.

MESSRS. G. & W. MORGAN, of 393, Union-street, Aberdeen, are introducing a system of electric lighting for studio portraiture, for which they claim the following advantages: Large area of dispersion and diffusion, from 108 to 180 square feet; greatly increased rapidity; entire freedom from eye strain (softer light); economy of current, and ease of manipulation.

The system has to be fitted permanently into the studio, on the opposite to the daylight glass, resembles an ordinary window for daylight, and is fitted with a special kind of obscured glass. The light used is from arc lamps automatically fed, and so arranged behind the obscured glass, and fitted with a system of diffusers and reflectors, that all the rays from the arcs, both direct and reflected, pass through the obscured glass into the studio, one mass of soft, but very actinic, light, every part of the glass frame having an equal amount of illuminating power.

The arc lamps are compensating in their action, so as to work well in series, and are economical of current; they also carry a large quantity of current, if necessary, for rapid exposures.

Messrs. Morgan further state that, using full power with a rapid plate, and lens working at *f*-3, children can be taken in quarter-second exposures. The light may be increased or diminished at the will of the operator so gradually as to cause no distraction of attention on the part of children and others. The working parts are all out of sight except the switch-boards.

We have had submitted to us specimens of large portraiture produced by the aid of Messrs. Morgan's system of electric lighting. They are certainly fine examples of this class of work, and are barely distinguishable from effects obtained by means of natural illumination.

#### THE RIGHT TO THE NEGATIVE.

The case of Harbord *versus* Brewer & Co., came on at Yarmouth County Court last week. It was an adjourned claim by Mr. A. T. Harbord, solicitor, for the return by the defendants of several photographic negatives.

The action was heard at the last Court, the point involved being whether negatives are the property of the customer or of the photographer. The defendants had bought the negatives in dispute with numerous others at an auction of Mr. Watson's effects on Regent-road, and plaintiff, hearing of this, claimed the negatives as his property, declaring that they never should have been sold by a third party. His Honour at the last hearing was inclined to the opinion that the law was, that negatives were the property of the customer, but on the representations of Mr. A. F. Clowes, the defendants' solicitor, his Honour consented to reserve his opinion till the subsequent Court.

His Honour now gave judgment, and said he had looked at the cases. He could not find any case in the High Court that practically decided the point whether a photographer was entitled to the negatives or not, but cases in the County Court which bore upon the point showed that the photographer was entitled to the negative. His verdict must, therefore, be for the defendants.

Mr. Clowes remarked that the case had excited great interest in the photographic world, and he asked his Honour to grant him a special fee, as the matter was of public interest. He was sure, if his Honour awarded him 10s., Mr. Harbord would be glad to pay, as he got his legal advice on the point free, gratis, and for nothing.

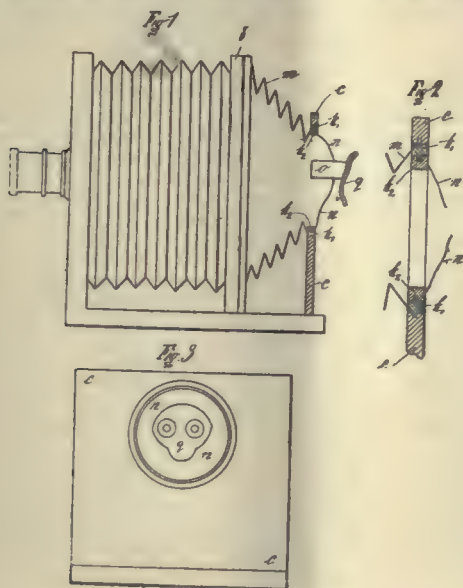
His Honour, however, said he could hardly certify that the issue was one of public importance.



## A NEW FOCUSSEING DEVICE.

This has been devised by Mr. J. Fleck, who describes it as consisting of two parts or "focussing bags,"  $m$  and  $n$ , connected together by means of concentric rings,  $k_1$  and  $k_2$ , that are rotatably fitted together. The part,  $m$ , which has preferably the form of a bellows, is attached at its front end to the back of the camera. The part,  $n$ , is provided at its rear end with a mask,  $q$ , which is shaped to fit the face, and which is formed with sight holes directed towards the focussing plate mounted in the camera frame,  $b$ . These sight holes are preferably fitted with eyepieces,  $o o$ . In this manner the two advantages which are found to be incompatible with each other in other apparatus, namely, the complete exclusion of light and the capability of using eyepieces, are here both obtainable in one device.

For the purpose of enabling the focussing to be effected with still



greater sharpness, the part,  $n$ , is made of soft light-excluding fabric.

If it is desired to view more fully the outer portions or edges of the image on the focussing plate or screen, it is merely necessary to remove the eyepieces,  $o o$ , together with the mask,  $q$ , resting normally in a fork support (not shown in the figure) out of the said support, and to move the same around the entire contour of the image within the limits of the ring,  $k_2$ .

The forked support is mounted on the upright,  $c$ , in which also the outer ring,  $k_1$ , is fixed. The upright,  $c$ , can be made to slide for the purpose of adjustment in guides fixed to the camera frame, and, when the correct distance from the focussing plate has been found, the upright,  $c$ , is clamped in the said guides by means of a spring or pin.

## ELEMENTARY PERSPECTIVE AND COMPOSITION.

At the meeting of the London and Provincial Photographic Association on December 7, Mr. W. R. Stretton read a paper on the above subject.

He said that, even amongst advanced workers, there often existed a very hazy knowledge of the scientific principles underlying the production of a picture, and especially in regard to their application at the moment of taking a photograph, and that, while most people possessed an inherent power of appreciation of pictorial result, those who can produce from the abundance of nature such results are lamentably few. "In a multitude of counsel there is usually wisdom," and, as his remarks were primarily addressed to the beginner, he had no fear of criticism, but would welcome anything that might remove ignorance of facts and add to his own knowledge. The usual lines of instruction with their apparent jangle of technical terms are best avoided, if one would interest the average aspirant to society medals; therefore, the subject must be treated from merely a mechanical aspect, what a composition is, and how perspective comes into play in producing it. Composition is only the arrangement of complex forms in order to present them to the eye as a single idea. Perspective is a mechanical process involved in reaching it, and is a technical name for certain natural laws that regulate the size and appearances of all objects, according to their distance and intensity of illumination. Perspective drawing is the mechanical rendering of objects in the same way in pictorial forms, with the essential difference that the objects are shown upon an imaginary surface at an arbitrary distance from the eye. A pinhole camera is a perfect perspective recording instrument, giving a rendering in precise values according to the

distance of objects before it. The substitution of a series of lenses for the pinhole provides the power of altering the size without the appearance of the objects, or, in the opposite way, it gives the power of altering the distance and appearance without altering the size.

Does the camera lie? The camera and lens tell only such lies as its users direct and concoct, but the machine is labelled instead of the man. Photographers of life-long standing have criticised prints, and ejaculated, "Too short a focus lens was used;" but it is out of the power of a man to tell from any strange print or negative the focal length of the lens used. A well-known man has said of a quarter-plate photograph that it was taken with a short-focus lens, whereas it was taken with a nine-inch lens. For particular subjects each has better qualities than the other, but the general principles involved are simply those affecting the angles, and consequently light and shade effects. That, where objects lie parallel with the plane of the picture, short-focus lenses are best used is well known, and long-focus lenses where objects lie obliquely, though the question is determined by the lighting.

When once I said (continued the lecturer) that there was no more art in the average photograph than the amount that existed in the object in front of the lens, the judgment exposed was considered rather harsh, but the fact remains that the really good composition amongst the vast number of exposures is lamentably small. Pictorial composition is a natural gift not freely bestowed. It is the power of selecting and recording objects in such a way that, when the whole be viewed, the balance and proportion of parts allows the eye to take in the whole as a complete subject. The photographer must consequently, upon the precision of the facts as shown by his lens, use far greater power of selection in making a composition than an artist, and he must of necessity oftentimes include absolutely objectionable facts such as would be excluded by his brother of the brush.

An effective illustration is shown in the slides upon the screen, the first showing two unconnected spots interfering with each other and irritating the eyes; the second has a connecting line by which the irritation is removed, and the eye appreciates the whole, for photographers' composition is one continued struggle to make isolated objects and masses into some general scheme. They are continually finding out that visual values and perspectives differ from those recorded by our lenses and our photographic plates, so that one comes to the conclusion that, when opticians can give us a lens that will work like that of the eye, any one with a camera will be able to mechanically produce compositions, for the difference between the two lenses explains everything. The eye can only focus a point, but that at any distance, and everything beside that point is not clearly defined. The photographic lens is supposed to be specially made to focus everything beyond a certain distance, so that, to show the objects in some way that only a definite idea be conveyed, the eye becomes a necessity.

Space prevents reference to the extensive and valuable hints upon the arrangements of masses and lines, triangular, square, and circular forms, breaks and their uses, light and shade, the limitations of the photographic plate in its imperfect transcription of varying intensities, questions of foreground and point of view, sky and cloud, and their suitability, &c., but, in conclusion, Mr. Stretton urged the importance of aiming as near perfection in pictorial results at the initial stage of exposing the plate rather than to trust to the power of alteration in the print. It is more truthful to nature and photography alike.

Mr. Philip Everitt wished first of all to disabuse some of the members of the idea voiced by other of his fellow-members that he made any claim to artistic capability, and especially with the camera. The amount of matter laid before the meeting made it difficult to select any one thing for comment, but he thought Mr. Stretton might have laid greater stress upon composition, in so far as masses of light and shade were concerned as opposed to lines. Lines were very important, and they certainly did tend to give the observer of the picture an indication of the artist's intention; but masses of light and shade and their arrangement were more important in a photograph than mere lines. One must consider in what way one is most likely to get particular effects, by attention to lines or by attention to masses of light and shade. He believed by the latter, and it was one of the faults of photographers of the present time that they were not direct and simple enough in what they did. They strove far too much for detail, and too little for breadth of effect. This led him to the conclusions of the Chairman, who said that there was no analogy between the eye and the lens. He saw, however, a strong analogy, and the functions performed by the two were very similar. The defect lay rather with the photographer in getting certain planes in focus and suppressing other planes. There may be two or three facts in a picture which one wants to connect, and they lie in different planes. The problem is how to delineate these masses sufficiently, and yet suppress, perhaps, the intervening spaces. It is often a practical impossibility, and the work breaks down because of too much detail in parts not requiring it. Another point on which greater stress might have been laid was this, the function of the horizon and its position in the picture. He well recollected the case of a friend who wanted to take some cloud negatives at the seaside, and who ascended a height under the belief that he would better succeed there than below. He was astonished to find that he got less sky from the higher ground than from below. Many people overlooked this fact. But the lower you want your sky line the



ower must be the camera, and the higher the line the higher the camera. The sky line must always be at the height of the camera or observer.

Mr. Walter D. Welford believed that the motive underlying the lecture was truthful rendering of subjects before one by photography, but he never understood why it was necessary to portray a landscape truthfully at all. If, in looking at a picture, one had exact distances of things, angles of view, and so forth, it would be a different matter. But, as a rule, one had no knowledge of the place or its bearings, the simple question being, Is it pleasing or pictorial or not? It seemed to him that, although underlying principles were helps to pictorial composition, yet there were hundreds of paintings and photographs which please us well, until somebody discovers something about the place and says that it is not in strict composition. He was struck with one slide, of which it was said that a certain tree would be better removed. Now, if he were convinced of this, he should have blocked it out or done something else to satisfy his conscience. There was no advantage in the merely strict delineation of a scene, as, unless it be known, it makes not an atom of difference.

Mr. Stretton did not see any reason to excuse his criticisms of the slides, which by some were thought to be severe. Having started out to work on certain definite lines, his purpose was to prove it by illustration, but he was willing to admit that few people could supply thirty slides such as those shown with such a high average perfection, and they were very creditable to their maker. In talking about lines to the exclusion of masses, he confessed that it was a case of getting into studio cant. Lines of a composition are made up of masses, and the successful handling of these makes the beauty of the composition. Mr. Stretton thoroughly believed that Mr. Welford could not understand the necessity for truthful rendering of a subject. He had heard him say that the ultimate object was the print, but here he had to disagree. If one is going to take a photograph, and it is not to be anything else, well, there is an end to art in photography.

#### NEWCASTLE AND NORTHERN COUNTIES PHOTOGRAPHIC EXHIBITION.

THE Annual Exhibition and *Conversazione* in connexion with the Newcastle and Northern Counties Photographic Association were held last week in the Barras Bridge Assembly Rooms, Newcastle. There was a large attendance, over which the President (Mr. G. B. Bainbridge) presided, and he was supported by the following gentlemen: the Rev. Principal Gurney, Messrs. T. Bainbridge, G. L. Snowball, W. S. Corder, Percy Corder, W. E. Cowan, John Watson, Barkas, Spence, Milburn, and others.

The President extended a very warm welcome to Principal Gurney, who, he said, was ever ready and willing to help forward any objects, social or scientific.

Principal Gurney, who was received with loud applause, said he thanked them for the honour they had done him in inviting him to open that Exhibition and *Conversazione*. It was the more gratifying to him because he ventured to believe that it was no mere personal compliment, but rather a recognition of the position and work of the University College of Newcastle, and, therefore, a courtesy which his colleagues as well as himself highly appreciated. Although the Newcastle-upon-Tyne and Northern Counties Photographic Association and the Durham College of Science could hardly be described with accuracy as kindred institutions, there were many reasons why they should be drawn together in cordial sympathy and mutual sincere respect. Photography, when properly understood, was built up upon two great foundations—science and art. Both departments were, he ventured to say, represented at the local College in a manner satisfactory to students and creditable to this great city, the metropolis of the north, and certainly no one could look round that splendid Exhibition without realising that those members who had produced those excellent examples of their art must have availed themselves of the latest resources of science, and also that they must have had considerable practical acquaintance with the principles and laws which had been indicated by the greatest artists of the world. He had to acknowledge himself to be a mere outsider in photography. The exigencies of a busy life had left him little time and few opportunities to indulge in what might have been to him, as it had been to many of his friends, the most delightful of hobbies; in fact, he believed he laboured under the not uncommon disadvantage of having been born too soon.

After referring to photography in the sixties, the Principal went on to say that chemistry had made enormous strides; physics had advanced even more rapidly; but the most striking and most important progress had been made on the artistic side of photography. It was evident that mere manipulators of apparatus might be little more than mechanics, or even intelligent recording machines; but photographers had recognised the splendid capabilities of their art, or perhaps it would be more accurate to say that they had raised the old handicraft into an art. Nothing was more noteworthy in such exhibitions as the present than the profound artistic knowledge displayed in many pictures. Nowadays no wise person would venture to depreciate the importance of studying the rules of art, and be content to trust to what was called their good taste. The good taste of an untrained mind was a very uncertain

quantity. Genius might here and there establish a few exceptions, but they only served to prove the rule. The majority of men and women ought to be taught what to admire, and why they ought to admire it. They might all like in their own way what was beautiful, but the most intense sense of pleasure in the perception of beauty was reserved for the artist. To copy nature by a mechanical process could give none of that intellectual delight which was obtained from the consciousness that they had obtained the best result from certain given materials—that by putting their mind and heart into their work they had taught the world a truth that it would be the happier for knowing, and by a creative idea they had increased the perception of beauty. No thoughtful person could study the photographs displayed in the Exhibition without the conviction that they were works of art; there could be traced the working mind of an artist. They were not the result of the labour of a mere mechanic. Of course, their production required an operator familiar with his materials and trained in every stage of the scientific process. Every art was learned by assiduous practice, and photography was no exception to the universal law. The photographer must know how to make the best of his subject—how to set forth his picture so that it might present the most pleasing appearance without any sacrifice of truth. It was absolutely necessary that he should be able to manage light and shade. Chiaroscuro gave breadth of effect, it prevented attention being attracted to parts meant to be subordinate. There could be very little satisfaction in a picture where there was no unity, where the artist had failed to produce a complete and harmonious whole. In a well-thought-out picture there should be balance as well as contrast. One of the chief sources of pleasurable impressions was undoubtedly variety; without variety of line, and of form, and of light and shade, the composition was apt to become dull and monotonous; but in the effort to introduce variety they must never allow themselves to lose sight of the charm of simplicity. No amount of ingenuity of intricate contrivance would compensate for the absence of repose. Lastly, it should be remembered that suggestion was often more effective than emphasis. It was more important to know what to omit than what ought to be included. A knowledge of what must be sacrificed was even more necessary than the perception of intrinsic beauty of details. No artist could fully grasp the capabilities of his art who had not thoroughly familiarised himself with its limitations.

In conclusion, Principal Gurney congratulated the Association upon the success which had crowned its work, and the utmost he hoped to do was to stimulate and encourage young beginners to try to realise the dignity of their art, to cherish high ambitions, to express noble thoughts by intelligent work, to the delight and instruction of all to whom it might come, and thus to add to the happiness and progress of their generation.

The members' competition produced a large entry of work, in which a marked improvement on former years was visible.

The following are the awards: Silver medal, Mr. W. S. Corder, portrait; bronze medal, Mr. G. B. Bainbridge, cattle; Mr. G. L. Snowball, landscape, with sheep; highly commended, Mrs. Burrell, portrait; Mr. Hendry, landscape; Mr. W. B. Ellis, landscape; and Mr. Brady, landscape.

In addition to the members' competition work, there was also a representative loan collection, including work by Messrs. Craig Annan, Wellington, Wade, Charles Reid, Lodge, Worsley Benison, Thomas, L. and H. Selby, Cockerill, and many others.

#### THE CAMERA CLUB.

FROM the December number of the Camera Club *Journal* we extract the following interesting announcements:—

We regret to have to announce the retirement of Mr. Basil Lawrence, who has for a long time ably edited the *Journal* under very considerable difficulties. Owing to his resignation, it has been decided that the editorship shall be placed "in commission." After this month the *Journal* will, therefore, be conducted by a small sub-committee.

Several of our members of the Services have received orders to proceed to South Africa. Among them, Major-General Sir H. E. Colville is in command of a Brigade of Guards; Lieut.-Colonel Lysaght is in charge of the Treasury Chest, and, we trust, will be able to find room somewhere for his camera; Surg.-Major Beevor, of the Coldstreams, who did so much good work with the X rays during the Afriki campaign, is again to the front. The cavalry will have the advantage of the experience gained by Major Eckersley in the last Ashanti War. Major Hickman Morgan, D.S.O., has embarked as Principal Medical Officer in charge of the *Princess of Wales*, with a large staff of surgeons, nurses, and men of the R.A.M.C. This ship, which is, doubtless, known to many members as a popular cruising yacht, the *Midnight Sun*, has been completely fitted up as a hospital ship. It is to an expert and scientific photographer and member, the Duke of Newcastle, that the country is indebted for the presentation to the *Princess of Wales* of a most complete apparatus for investigation by means of the Röntgen rays.

We must all welcome among us once again our old friend, Captain Hinde, who, after having distinguished himself as an officer in the service of the Congo Free State, and as the author of *The Fall of the*



*Congo Arabs*, has of late years been in the service of the East African Protectorate, in charge of the Massai tribe, who occupy a district which is really undefined, but is roughly about 250 by 150 miles. His headquarters are at Narrobi; but, as the tribe is nomadic, Captain Hinde is generally on a tour of inspection, and leads also a wandering life. Sport has, fortunately, not been lacking in his district, and as he has promised to give us an evening, describing the country, the people, and the other animals on Thursday, January 25, 1900, we hope that he will also be able to show us some of the results of his powers with gun and camera.

On Monday evening last, Mr. E. J. Humphery, M.A., addressed the members of the Club on the subject of the new oxy-magnesium lamp, the invention of the Platinotype Company, which has already been described in our columns. There was a very large attendance of members, and Captain Abney occupied the chair. In the course of the evening some twenty-four portraits of members and visitors were taken by means of the light, and all the exposures were successful. This is very high testimony to the simplicity and efficiency of the apparatus.

## Our Editorial Table.

### FLORENTINE FRAMES,

Manufactured by FROST & REED, 8 Clare-street, Bristol.

By the courtesy of Messrs. Frost & Reed we have become the recipients of a welcome gift in the shape of a new frame, which they have specially designed for photographic portraiture. It is carved in walnut, to the Florentine design, and has an English gilt bevel flat, proportioned to the size of the frame. The one sent us is for 12 x 10, and the depth of the richly carved frame is three inches, the bevelled flat being nearly another inch. Messrs. Frost & Reed say that the width of the moulding is increased in larger sizes and diminished in the smaller, so that the proportions may always be relied upon for correctness and suitability to the size. Besides the frames carved in walnut wood, the same kind of frame, in carved wood richly gilt, is also supplied.

We have very great pleasure indeed in bringing the Florentine frames to the notice of our readers. The carving is beautifully done, and the frames are neatly made and finished throughout. Portraits so framed might be safely hung in the drawing-room, in the assurance that they would be in complete accordance with the best taste. The Florentine frames should receive a considerable share of patronage from photographers.

### THE BRITISH WEATHER CHART, 1900.

By B. G. JENKINS, F.R.A.S. Large size, 25 in. x 10 in.; post free, 6½d.  
London: R. Morgan, 65, Westow-street, Upper Norwood, S.E.

In this chart the author has forecast the probable weather of each month for next year. A series of mean readings is also given, and the entire chart is based upon the information and data contained in papers previously published. Mr. Jenkins remarks that he is now "able to state that the forecast curves may be relied on as a basis for deducing the general character of the weather of 1900."

### THE INTERNATIONAL ANNUAL OF ANTHONY'S PHOTOGRAPHIC BULLETIN, 1900.

Edited by W. I. SCANDLIN. 312 pp.  
London: Percy Lund & Co., 3, Amen-corner.

Good paper and printing, and numerous well-produced half-tone illustrations from photographs, help to make this a handsome book, and the articles and formulae constitute it as useful as it is handsome. Amongst the European contributors we notice the names of R. A. R. Bennett, C. H. Bothamley, R. H. Bow, J. Gaedicke, M. J. Harding, Chapman Jones, Rev. F. C. Lambert, Rev. T. Perkins, G. E. Thompson, Major-General Waterhouse, and others. The Anthony Annual is full of readable information on photography.

### LEHRBUCH DER PHOTOGRAPHISCHEN CHEMIE UND PHOTOCHEMIE.

#### II. THEIL: ORGANISCHE CHEMIE.

By ALEXANDER LAINER, Professor at the Vienna Technical School.  
R. Lechner, K.U.K. Hof und Universitäts-Buchhandlung, Vienna.

This volume forms the second part of Dr. Lainer's work on Organic Chemistry, and with the first volume on the Inorganic, published some time since, completes a work on Photographic Chemistry of considerable value. The present volume deals with the aromatic compounds, and is consequently of special interest. It brings within its scope all the modern developers, the colour sensitizers, the albumens, and the albumenoids. A very useful appendix deals with the method of determining the constituents of an inorganic salt soluble in water.

## News and Notes.

**PHOTOGRAPHIC CLUB.**—Wednesday evening, December 20, at eight o'clock, "Elementary Chemistry of Photography," by Mr. C. F. Townsend.

On December 21, the London and Provincial Photographic Association will discuss "Old and New Developers." Visitors are welcome at the White Swan, Tudor-street, E.C.

**ROYAL PHOTOGRAPHIC SOCIETY.**—Photo-mechanical Meeting, Tuesday, December 19, at 66, Russell-square, at eight p.m. "Negatives for Three-colour Work," by Captain W. de W. Abney, C.B., F.R.S.

**MR. LYDDELL SAWYER**, of 230, Regent-street, W., is now engaged on a large life-size painting of Mr. John Hollingshead. This is to be presented to Mr. Hollingshead on the occasion of his forthcoming benefit at the Empire Theatre.

**BRIXTON AND CLAPHAM CAMERA CLUB.**—Mr. J. McKinley Milne writes "It is with regret that I have to inform you that Mr. Whittaker has been obliged to resign the position of Hon. Secretary to the above Club on account of ill health. All communications, &c., in connexion with the Club should be forwarded to me at 77, Atlantic-road, Brixton, S.W."

**MR. G. ALBERT SMITH**, F.R.A.S., of St. Ann's Well and Wild Garden, Brighton, asks us to announce that he has made arrangements with the Warwick Trading Company, Limited, 4 and 5, Warwick-court, High Holborn, London, W.C., whereby that firm will, for the next few years, have the exclusive benefit of the entire output from his Brighton factory.

**MR. A. H. BAIRD**, 89, Lothian-street, Edinburgh, desires the present address of Mr. J. Taylor, photographer, who during a period of five months (June to October) was photographing in the districts surrounding Lanark, Haddington, Portobello, Perth, and Cupar Fife. Mr. Taylor is English-spoken, is about forty-five years old, five feet four inches high, has a brown beard, and wears spectacles.

"THE BORDERLAND IN SONG AND STORY."—Under the auspices of the Edinburgh Photographic Society, the President (Mr. Alexander Eddington) delivered a lecture on "The Borderland in Song and Story," in Queen-street Hall last week. Mr. H. J. Blanc, R.S.A., presided, and there was a large attendance of members and friends. During the evening Mr. J. Douglas Young and Mr. George Barclay sang a number of Border songs, and the lecture was illustrated with an excellent series of lantern slides.

**BIRMINGHAM PHOTOGRAPHIC SOCIETY.**—In consequence of severe illness, Mr. F. Rayner will be unable to deliver his address upon "The United States of America," announced for Tuesday, the 19th inst.; but, in place thereof, Mr. J. F. Hall-Edwards, L.R.C.P., F.R.P.S., has consented to give a lecture upon "Colour Photography," dealing with the composition of light, the phenomena of the spectrum, and the latest and fullest development of colour photography. The lecture will be illustrated by Ives's kromoskop lantern, examples of Joly's process, and various interesting experiments.

**AFFILIATION OF PHOTOGRAPHIC SOCIETIES.**—At the Executive Committee Meeting, held at 66, Russell-square, on November 23, Mr. A. Mackie in the chair, the Committee accepted the kind offer of the loan of a lecture upon "Architectural Photography," in respect of the pictorial side of the subject, by Mr. Henry W. Bennett, F.R.P.S., whose lecture upon the technical details of this branch of work has been in circulation for some time. In response to a specific request, it was resolved to ask the Board of Judges to adjudicate upon lantern slides as well as print competitions sent in by the various societies. The position of negotiations for further lectures was laid before the Committee, and steps were also taken with a view to the speedy extension of the sets of lantern slides now available, and the acquisition of some new work.

**ROYAL INSTITUTION.**—The following are the lecture arrangements at the Royal Institution before Easter: Mr. C. Vernon Boys, six Christmas lectures (specially adapted for young people) on "Fluids in Motion and at Rest;" Professor E. Ray Lankester, twelve lectures on "The Structure and Classification of Fishes;" Dr. W. H. R. Rivers, three lectures on "The Senses of Primitive Man;" Professor H. H. Turner, three lectures on "Modern Astronomy;" Dr. Charles Waldstein, three lectures on "Recent Excavations at Argive Heraeum (in Greece);" three lectures by Sir Hubert H. Parry; Mr. W. L. Courtney, three lectures on "The Idea of Tragedy in Ancient and Modern Drama;" The Right Hon. Lord Rayleigh, six lectures on "Polarised Light." The Friday evening meetings will begin on January 19, when a discourse will be given by the Right Hon. Lord Rayleigh on "Flight;" succeeding discourses will probably be given by the Hon. C. A. Parsons, Professor J. Reynolds Green, Mr. H. Warrington Smyth, Professor J. H. Poynting, Major Ronald Ross, Professor Frank Clowes, Sir Benjamin Stone, M.P., Professor J. Arthur Thomson, Sir A. Noble, Professor Dewar, and other gentlemen.

**HOVE CAMERA CLUB EXHIBITION.**—The following is the list of the Judges' awards:—Challenge Silver: Mrs. A. O. Jennings, *Biddy*, No. 208. Class A (open), Champion: Silver, withheld; bronze, Mr. W. F. Slater, No. 3, and Mr. J. M. Whitehead, No. 7; certificate, withheld. Class B (open): Silver, Mr. P. S. Lancaster, No. 96; bronze, Mr. C. P. Stoner, No. 33; certificate, Mr. Douglas English, No. 67. Class C (open), Lantern Slides: Silver, Mr. J. Kearney, No. 129; bronze, Mr. Edgar R. Bull, No. 131; certificate, Mr. Greystone Bird, No. 111; special certificate, Mr. W. Archibald, No. 116. Class D (open): Silver, Mr. W. G. Cotesworth, No. 166; bronze, Mr. Lumley Cator, No. 162; certificate, Mr. H. Cookeon, Nos. 145-148. Class E (Club), Landscape: Silver, Mr. R. C. Foskett, No. 173; bronze, Mr. W. A. Ford, No. 181; certificate, Mr. C. B. Stoner, No. 177. Class F (Club) Marine: Silver, Mr. Douglas English, No. 192; bronze, Mr. R. C. Foskett, No. 189; certificate, Mr. C. B. Stoner, No. 196. Class G (Club), Figure Studies: Silver, Mrs. A. O. Jennings, No. 208, and Mr. Douglas English, No. 212; bronze, withheld; certificate, withheld. Class H (Club), Architecture:



Bronze, Mr. R. Chimes, No. 240; certificates, Mr. D. J. Gadsby, No. 238, and Mr. R. C. Ryan, No. 244. Class J (Club), Lantern Slides: Silver, withheld; bronze, Mr. A. B. Sargeant, No. 250, and Mr. Douglas English, No. 254; certificate, Mr. W. A. Ford, No. 261. Class L (Club), Lantern Slides: Bronze, Mr. A. R. Sargeant, No. 264; certificate, Mr. Douglas English, No. 268.

To the current issue of the *Transactions of the Botanical Society of Edinburgh* Mr. R. A. Robertson contributes a practical paper on the "Photo-micrography of Opaque Stem Sections—Recent and Fossil." Mr. Robertson's method has much to recommend it to all who are engaged in research work or teaching, and who need a method of reproducing accurately the diagnostic characters of timber as seen in transverse and longitudinal sections. Micro sections as usually made do not present enough surface to exhibit, typically, all of the characteristic appearances. Large areas are therefore necessary, and it is to a demonstration of the best method of obtaining these that this paper is devoted. No sectioning is necessary, as only the specially dressed opaque surface of the block of wood is micrographed. This is a distinct advantage where museum specimens are concerned, as the micrograph may be taken without in any way damaging the preparation. A photo-micrographic camera, which is capable of working either vertically or horizontally, is best adapted for the purpose. The microscope accessories are removed, and a half-plate lens is fixed to the front of the camera. The wood specimen is propped up in position in front of the camera, so that the plane surface is at right angles to the optic axis of the apparatus. Focussing is arranged by means of a Welsbach incandescent gas-light, which stands on one side of the apparatus, and finally by means of a focussing glass and magnesium wire. The radiant for exposure is a magnesium ribbon apparatus, arranged like the Welsbach on the opposite side. Mr. Robertson's experiments show that eight inches from the surface of the wood is the best position for the light when exposing. The time of exposure varies with the plate, intensity of light, and colour of the wood. With slow Ifords forty seconds have been found to give very satisfactory results.—Mr. J. H. COOKE in *Knowledge*.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
18.....	Bradford Photo. Society .....	Yorkshire Photographic Union—Loan Collection Lantern Slides.
18.....	Camera Club .....	Photographic and Mechanical Discussion.
18.....	Cripplegate Photo. Society .....	Members' Night.
18.....	Glasgow and West of Scotland .....	Matéria Photographica. W. J. B. Halley.
18.....	Kingston-on-Thames .....	Christmas Card Competition.
18.....	Oxford Camera Club .....	A Trip on the Mediterranean. E. A. Bevers.
18.....	Stafford Photo. Society.....	Photographic Christmas Card Competition.
18.....	Whitby .....	Demonstration: Bromide Enlarging. E. Hall.
19.....	Birmingham Photo. Society ..	A Four Months' Tour in the United States of America. F. Rayner.
19.....	Gospel Oak .....	Demonstration: Carbon Process. W. Beyer.
19.....	Hackney .....	Plates and Papers for Pictorial Work. A. Horsley Hinton.
19.....	Iale of Thanet .....	Negative-making. Rev. F. O. Lambert.
19.....	Redhill and District .....	Demonstration: Printing in Clouds. T. P. Padwick.
19.....	Royal Photographic Society ..	Negatives for Three-colour Work. Capt. W. de W. Abney, C.B., F.R.S.
20.....	Borough Polytechnic .....	Elementary Orthochromatic Photography. E. Sanger Shepherd, F.R.P.S.
20.....	Photographic Club .....	Elementary Chemistry of Photography. C. P. Townsend.
20.....	South London .....	Social Evening.
20.....	Southport .....	Demonstration: Working of the Sandell Perfect Plates and Films. J. T. Sandell.
20.....	Southsea .....	How a Lens is Made. C. P. Goers.
20.....	West Surrey .....	Lantern Night: Members' Slides.
20.....	Woodford .....	Modifying Developers. H. W. Bennett, F.R.P.S.
21.....	London and Provincial .....	Discussion upon Developers, New and Old.
21.....	Oldham .....	Negative-making. Reader, James Whitehead.
21.....	Oroydon Microscopical .....	Conversational Meeting.
22.....	Darwen .....	Prize Slides.
22.....	Leeds Photo. Society .....	Annual Meeting.—Election of Officers.—Exhibition of New Slides by Godfrey Bingley.

### ROYAL PHOTOGRAPHIC SOCIETY.

DECEMBER 12,—Ordinary Meeting.—Mr. Chapman Jones, F.I.C., F.C.S., in the chair.

#### ILLNESS OF MAJOR-GENERAL WATERHOUSE.

The CHAIRMAN expressed deep regret, in which the members participated, that the Hon. Secretary, Major-General Waterhouse, had been unable to attend this meeting, and one or two previous meetings, in consequence of a bronchial affection from which he was suffering, and a general wish was also expressed for his speedy recovery.

#### NEW MEMBERS, &c.

Thirteen new members were elected, and ten candidates for membership were nominated.

The CHAIRMAN announced that Dr. Abbé had been elected an Honorary Fellow of the Society.

#### THE NEXT EXHIBITION.

It was stated that the Organizing Committee for the Exhibition of 1900 had been constituted as follows: Messrs. Chapman Jones, A. Mackie, J. J. Vezey, R. Child Bayley, H. Vivian Hyde, F. C. Lambert, J. A. Sinclair, J. B. H. Wellington, H. Snowden Ward, and J. C. S. Mummery.

#### ELECTION OF AUDITORS.

Messrs. H. Vivian Hyde and W. Thomas were unanimously elected auditors of the accounts of the Society for the current year.

#### THE DALLMEYER FOCOMETER.

Mr. T. Bolas, F.I.C., F.C.S., read some "Notes on the Use of the Dallmeyer Focometer," the instrument which formed the subject of Mr. Dallmeyer's Traill Taylor Memorial Lecture, and which was presented by him to the Society. Mr. Bolas said his principal object was to emphasise the fact that the Society were the owners of the apparatus in question, that members and affiliates had as easy access to it as to the books in the library, and that as much use as possible should be made of it. It was not an unusual or special form adapted solely or chiefly for the purpose for which it was designed by the donor; but it was an optical bench for general or universal service, and would be kept in a room where it would always stand ready for immediate use. He believed that an idea had been expressed in certain quarters that the instrument was so valuable and of so delicate a nature that its use should be subject to a series of regulations so drastic as to be only worthy of the London County Council; he hoped, however, that this would not be the case, for it was better to run the remote risk of slight damage than to fence the apparatus about with restrictions which would prevent its general use. It was a piece of work which any university or technical school laboratory would be proud to possess, considered simply as a rule, it was a very valuable possession, for it was by no means easy to get a good, rigid, graduated system of such length—eight feet. At several international photographic congresses attention has been called to the inaccuracy of the sizes of plates, and it had been suggested that plates which did not closely approximate to their nominal dimensions should be returnable to the makers, and also that there should be a definite limit to the thickness of plates in the respective sizes. Mr. Bolas showed how the focometer could be used for obtaining extremely accurate measurements of the linear dimensions of plates and of their thickness, and said that, if Mr. Dallmeyer had set out with that object in view, he could not have devised a more satisfactory instrument. With regard to its more legitimate purposes, he thought it would be chiefly used by members of the Society for the accurate determination of the focus of lenses, and for locating on the mounts of the lenses the principal planes; and he suggested that those who preferred to work entirely by mechanical methods, and to get their results without calculation, would find it very convenient to employ Dr. Schroeder's method, which, with other methods, he described and illustrated. He proceeded to point out that, if certain additions were made from time to time as required, the Society would be in an altogether unique position as regarded the facilities which it could offer for the examination of lenses. For instance, means might be provided for measuring flatness of field, and for examining a lens for marginal definition as affected by astigmatism.

Messrs. DALLMEYER, DEBENHAM, TALLENT, and LAMBERT, and the CHAIRMAN took part in the brief discussion which followed the reading of the paper.

#### PRINTING TYPES.

Mr. Bolas then read a further paper on "The Origination of Printing Types by Photographic Methods," in which, having explained the method of making printing types from original steel punches, he proceeded to point out the essential difference between the very slight bevel or angle of relief ordinarily given to the face of a type-founder's punch, as contrasted with the irregular hill-like slope of a letter photographed either separately or as part of a printed page. He suggested that the steep slope of the type-founder's punch arose less from the exigencies of printing than by reason of the inconvenience which would arise in casting type if the slope from the face towards the shoulder were less steep, the inconvenience of a less steep slope being most pronounced in the case of faces which come close to the margin of the shank or which oversail as "kerns." He gave manipulatory details whereby small pieces cut from a phototyped sheet might be so mounted as to make serviceable photographic punches, or originals from which electrotyped matrices could be made; and he demonstrated the hand-casting of a type from a photographic matrix. The paper concluded with a suggestion that photographic reproduction might conduce towards a return to the free or writing style for printing characters, and instances were given of cases in which the method would be economical.

#### COMING EVENTS.

December 19, Photo-mechanical Meeting, "Negatives for Three-colour Work," by Captain W. de W. Abney, C.B., &c. January 2, 1900, Lantern Evening, "Round about the Matterhorn and the Aletsch Glacier," by Mr. Henry Speyer.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 7,—Mr. J. E. Hodd in the chair.

Mr. WALTER D. WELFORD (the Hon. Secretary) passed round some of Burroughs, Wellcome, & Co.'s ortol tablets for trial. There was a curious point about the proportions of the ingredients to which he wished to draw attention. The firm had for some time been working out the formula without his knowledge, and they also knew nothing about his own experiments until the publication of his recent article on the subject. He now had the formula of Burroughs, Wellcome, and himself compared in grains, and the similarity between them was remarkable. On a basis of 2 grains of ortol, the difference in the quantity of sodium carbonate was 0.2 in 16 grains. The sodium sulphite was



as 1 to 2, and the bromide as 4 to 1, but, as there was no hypo in the tabloid formula, the result was practically the same, for Mr. Welford had a small proportion of this slight intensifying agent.

Some prints of several colours upon Gravura paper were shown, some done by Mrs. Welford and black in tone, and others by Mr. Bartlett of a warmer colour.

Mr. A. MACKIE took the opportunity of criticising the custom with many paper-makers of supplying their goods in cut sizes and not in sheets. Large numbers of people had little or no use at all for fixed sizes, and it would be a great boon if they were enabled to buy in large sheets if they so wished.

The suggestion was thought to be one which would commend itself to the makers' attention.

The CHAIRMAN showed half-a-dozen lantern plates, nine years old, for comparison with what was thought the proper thing of the present day. The glass was of about double the thickness which is now the fashion, a generosity which would be now little appreciated.

Mr. MACKIE remarked that, while thin glass was desirable for plates of small dimensions, it was very risky for 12×10 or larger plates. He had used plates which positively bent in the hand.

#### PHOTOGRAPHIC CLUB.

DECEMBER 6.—Mr. A. Mackie in the chair.

Mr. F. A. BRIDGE remarked that, in Mr. Fall's recent lantern lecture upon animal photography, an observation was made that he could not use for his work backed plates, because the backing slowed the plates to a degree which he could not afford. It would be interesting to know whether this was also the experience of other members.

The CHAIRMAN thought that many people entertained the idea that backing slowed a plate, on the ground that the backing medium prevented the reflection of light from the back surface of the glass, which would otherwise help the exposure.

Mr. J. R. GOTZ said that, when a plate was backed by a white medium, it quickened the plate. The inverse would be that a dark backing would slow it. This was perhaps Mr. Fall's basis of argument.

Mr. HENRY E. HULL had proved that a white backing helped the exposure a little, although tending towards halation. However, it did what was often wanted. Practically it was a help, but theoretically it was not very likely.

Mr. BRIDGE was doubtful about the matter, and thought that, given decent conditions, backing could not possibly slow a plate.

Mr. BRIDGE showed two negatives on Secco film, which he had developed and stripped, and a discussion ensued as to the possibility of the grain showing in the resulting print or positive. A slide was subsequently made, but nothing aggressive was noticed. It will be shown on the screen, however, at a future meeting.

#### GRAVURA PAPER.

Mr. BALDWIN demonstrated, for the Paget Plate Company, the use of Gravura emulsion upon paper, opals, and lantern slides. Gravura specialities offer a means of printing which can be safely conducted in diffused gaslight. The emulsion is slow, but such as to give, by modification, a range of colour from blue-black, through all the intermediate tints, to red chalk. It may be had either glossy, matt, or rough, and the colours are obtained in every case by pure development. Being a slow emulsion, exposure is best effected by the combustion of magnesium ribbon, rather than the use of the ordinary gas jet, and its superior constancy furnishes additional reason for its employment. For black tones, half an inch of magnesium at fifteen inches or more will be suitable for a negative of medium density; for brown tones, six times this quantity; and for red tones eight times should be allowed. For black tones, the developer should be used in what is termed "concentrated" form. A diluted developer with a short exposure tends to give greenish-black tints, not the blue-black for which Gravura is noted. As one lengthens the exposure for warm tones, so also, proportionately, must one dilute the developer. Red, the extreme of the warm colours obtainable, requires the longest exposure, combined with the weakest developing solution. The developer recommended is a metol-hydroquinone combination:—

Hydroquinone .....	55 grains.
Metol .....	14 "
Sodium sulphite .....	1 ounce.
Sodium carbonate .....	1½ "
Potassium bromide .....	2 grains.
Water, to make .....	1 pint.

For the warm tones dilution of the above is necessary, as stated, the scale being as follows:—

Cool to warm sepias .....	1 ounce to 5 ounces water.
Warm brown to red .....	1 " " 7 " "
Red chalk .....	1 " " 19 " "

In each case an increasing proportion of the following solution is also required:—

Ammonium bromide .....	1 ounce.
Ammonium carbonate .....	1 "
Water, to make .....	1 pint.

The quantity varies from 50 minims to half an ounce, according to colour.

A number of prints and opals were made and passed round, and a hearty vote of thanks was accorded to Mr. Baldwin.

**Croydon Camera Club.**—There was a goodly company on Wednesday, the 13th inst., to hear and see all about a new and certainly remarkable film, the invention of a member of the Club, Mr. J. T. Sandell. All kinds of "supports" have been advocated and tried for spreading the sensitive gelatine emulsion upon, but so far without absolute satisfaction. The remarkable point about Mr. Sandell's film is that there is no support whatever. The film consists of nothing but the actual gelatine emulsion itself. A moment's

thought will convince that, if there are no counteracting defects or faults due to the above expedient, there must be an enormous gain in doing without the troublesome support. Amongst the advantages are that development, proceeding from both sides of the film at once, is more rapid. For the same reason, fixing and washing are done far more quickly than with a glass plate or a celluloid film. A curious, undesigned advantage which accompanies the Cristoid film, as it will be called, is that, in consequence of the expansion set up in the gelatine film during development, each negative is a size larger than when exposed. Thus a quarter-plate will, after development, measure about 5×4, while the latter size will become enlarged up to about half-plate—6½×4½. If desired, this enlargement may, however, be prevented by the use of spirits of wine. Not the least advantage of this wonderful film is its great latitude, which Mr. GRANT, who, in Mr. J. T. Sandell's unavoidable absence, undertook the lecture and demonstration, stated was equivalent to the difference between 1 and 800. In order to illustrate this, he developed films, one of which he stated had received 300 times the exposure of the other. The above, together with other films, were developed all together in one dish for a fixed time of six minutes. The shortest exposed film was, when fixed, apparently of admirable printing quality; the other film was, as anticipated, too dense for use in ordinary printing; but, after a short immersion, straight from the hypo, in an amber-coloured solution of ferrocyanide of potassium, the reduction in density which ensued transformed it into an equally satisfactory negative. This valuable latitude is due to the fact that the Cristoid film consists of the double emulsion employed for the Sandell plates. In this there are two adherent emulsions, one being very rapid, the other slow and thickly coated. The developer advocated is one of the newest that has lately come to the front, viz., pyrocatechin, which, as the PRESIDENT remarked, recent improvements in manufacture have made absolutely reliable in action and cheap in cost, while investigations have resulted in a more suitable accelerator being used than was at first advised, with the result that we now find in this reducing agent a clean, reliable, rapid, and density-giving reducer, which is, moreover, a one-solution developer.

**Polytechnic Photographic Society.**—Mr. SANDELL gave a demonstration on his new Cristoid film before the Polytechnic Photographic Society on the 6th inst. This film, which is just being placed on the market, possesses similar characteristics to his well-known Perfect plate, and consists of a double gelatine emulsion without any other support. Particular attention was given to the difficulties which beset hap-hazard workers, and remedies were suggested, the chief of which, the lecturer stated, was to adopt the use of one plate and one developer, ingeniously adding, preferably, the Sandell Perfect and its recommended developer.

**Richmond Camera Club.**—The meeting on the 4th inst. was devoted to a show of members' lantern slides. Slides were shown by Messrs. Cheese, Dale, Davis, Emery, Kilbey, Richardson, and Rodman. Those by Mr. Davis were experiments with the new Gravura plates, and showed the range of colour obtainable very well. The slides by Messrs. Cheese and Rodman were illustrative of a cycling tour in Germany and Austria last summer, and Mr. Kilbey showed some remarkable results obtained with a focal-plane shutter working at 1/100 second.

**Woodford Photographic Society.**—This Society held its Annual Exhibition at the Wilfrid Lawson Hall, on Thursday, Friday, and Saturday of last week. The Thursday was devoted to a "private view" and the opening ceremony; on the other two days it was open to the public. A number of members and their friends gathered together on Thursday to welcome Colonel Lockwood, M.P., who performed the opening ceremony; and, after he had been conducted round the screens, he ascended the stage, and, in a speech remarkable at once for literary charm and graceful delivery, congratulated the Society upon the excellency of the work shown. After a slight interval a number of slides were passed through the lantern. The arrangement for the display of the pictures, as well as the quality of the work on view, showed an advance upon previous years. Nearly all the principal members contributed, as well as many of the younger ones, and, considering that no external photographic work was shown, the Society's display was very creditable, both in regard to quantity and quality. Many of the pictures have been on view in London and elsewhere from time to time. Among the principal contributors may be mentioned Messrs. H. T. Malby, F.R.P.S.; H. W. Bennett, F.R.P.S.; H. Wilmer, F.R.P.S.; E. Marriage, F.R.P.S.; A. Horsley Hinton, J. T. Ashby, E. Noble, W. L. F. Wastell, F. G. Ember, &c. The lantern slides and transparencies were quite a feature of the show, and attracted a great deal of attention. On Friday Mr. E. J. WALL, F.R.P.S., attended and gave a lecture upon "Colour Photography." The attendance throughout the whole time the Exhibition was open was very satisfactory, and gave great encouragement to those who worked so hard to make it a success.

**Fakenham District Camera Club.**—December 4.—Mr. WALTER D. WELFORD, F.R.P.S., favoured the above-named Club with a visit, and in the evening delighted a numerous company of members and friends with his lantern lecture, entitled

#### A BELGIAN EXCURSION.

The lecture was illustrated by about 200 slides from negatives taken by twenty-two members of a party which, in August last, spent a very happy week in Belgium under the leadership of Messrs. W. F. Slater and W. D. Welford. For an hour and ten minutes Mr. Welford kept every one thoroughly interested and amused, and the end came only too quickly. The slides were of uniform excellence and attractive variety, comprising cathedral and other exteriors and interiors, street and market scenes, figure studies, and river and canal scenes in and about Brussels, Antwerp, Namur, Dinant, Malines, Bruges, and Waterloo. The animal and bird studies at the Antwerp Zoo, and several of the interiors and character studies were especially good.

**Liverpool Amateur Photographic Association.**—The weekly meeting of this Society was held at the rooms, Eberle-street. Mr. F. ANYON gave an interesting demonstration on

#### COMBINATION PRINTING: THE EVOLUTION OF A SNAP-SHOT.

Mr. J. H. Welsh (Vice-President) presided. Mr. ANYON dealt with his sub-



ject in an able manner, and by practical illustration showed the ways and means of producing an artistic result by the combination of a series of pictures, mostly snap-shots taken at various times. By the means of snap-shots taken in Scotland, Bootle, and the Isle of Wight, Mr. Anyon produced a beautiful specimen of photographic art. While on the subject of combination printing, he showed the audience how, by means of quarter-plate pictures of sky and foreground, he could produce a beautiful result of half-plate size. A vote of thanks was accorded the lecturer on the motion of Mr. A. TYRRE.

**Edinburgh Photographic Society.**—The third meeting of the session of the above Society was held last week in the hall, 38, Castle-street, Mr. A. Edington (President of the Society) in the chair.—There was a large attendance. Mr. J. B. READMAN, D.Sc., read a paper on "The Chemistry of Photography in Relation to Development," showing the action of light on the silver sensitizers used in the photographic plate, and the action of the developing solutions. Mr. Readman illustrated his remarks by chemical experiments, and at the close was heartily thanked.

### FORTHCOMING EXHIBITIONS.

1899.  
 December 15-18 ..... American Institute Photographic Salon (New York). Hon. Secretary for European Exhibitors, H. Snowden Ward, 6, Farringdon-avenue, E.C.  
 „ 15-Jan.1900 Huddersfield (Invitation). W. A. Beevers, Cloth Hall-street, Huddersfield.  
 „ 27-30 ..... Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.  
 1900.  
 January 29-31..... Southsea Amateur Photographic Society. F. J. Mortimer, 10, Ordnance-row, Portsea.  
 February 10-24 .... Edinburgh Photographic Society. J. S. McCulloch, 10A, George-street, Edinburgh.  
 March ..... South London Photographic Society.  
 April 3-7 ..... Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Patent News.

THE following applications for Patents were made between November 27 and December 2, 1899:—

- PHOTO-PLASTOGRAPHY.**—No. 23,640. "Process of Casting Photographic Plaster or other substances for the Production of Stereotypes, Pictures, Engravings, and the like, flat or raised, and for the Reproduction of Photographs." M. BERNSTEIN.  
**ANIMATED PHOTOGRAPHY.**—No. 23,679. "A New or Improved Method for Photographing and Exhibiting Moving Pictures." G. HOLLINGUM.  
**COLOUR PHOTOGRAPHY.**—No. 23,685. "Improvements in Apparatus for Producing or Exhibiting Colour Photographs." W. WHITE.  
**PROJECTION APPARATUS.**—No. 23,742. "Improvements in Magic Lanterns and similar Projecting Apparatus." D. A. LOWTHIME.  
**COLOUR CINEMATOGRAPHY.**—No. 23,863. "Improvements in Cinematographs for Taking and Projecting Photographs in Colours." W. N. L. DAVIDSON.  
**FILM COATING.**—No. 23,880. "Improvements in Apparatus for Coating Photographic Films and Plates with Sensitive Emulsions." C. E. HEARSON.  
**FILM-DRYING.**—No. 24,020. "Portable Stand for Quickly Drying Photographic Films or Plates." E. K. HOLMES.  
**CINEMATOGRAPHY.**—No. 21,039. "Improvements in Apparatus for Taking, Projecting, or Inspecting Series of Photographs." W. BRITAIN, JUN.

## Correspondence.

\* \* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### STEREOSCOPIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Most human eyes are  $2\frac{1}{2}$  inches apart. As I have proved, a stereoscopic camera, whose lens centres are  $2\frac{1}{2}$  inches apart, gives ample

stereoscopic effect, absolutely without eye strain. Cameras with wider centres, therefore, give unnatural effects. There is much eye strain, which has probably much to do with the disuse of the instrument.

Small plates,  $5\frac{1}{2}$  by  $2\frac{1}{2}$  inches, would be cheap when the demand came. The camera with 4-inch lenses might be "fixed focus," or focussing, but any way would be as small as a  $\frac{1}{2}$ -plate hand camera—what an immense saving over the cumbersome things offered now. These huge boxes are again a powerful reason for leaving them at home. I should like to see you handle this subject, taking as text, " $2\frac{1}{2}$  inches must be right, as it is natural."—I am, yours, &c.,  
 OLD SUBSCRIBER.

[Our correspondent, who resides in a distant part of the world, has probably overlooked the fact that within the last year or two we have several times dealt with the subjects of hand cameras for stereoscopic work and the separation of lenses. The latter point formed the theme of an article in these pages so recently as September 22 last. In the main we agree with our correspondent's ideas, although a fixed separation of  $2\frac{1}{2}$  inches is wrong in practice. It suffices for objects near to the camera, but in landscape work, where it is sought to obtain relief in objects situated, perhaps, hundreds of feet away, a separation of  $2\frac{1}{2}$  inches is insufficient. We deal with the matter in our ALMANAC just published. Perhaps the most important matter in stereography is to see that in the prints or transparencies foreground objects are not separated more than  $2\frac{1}{2}$  or 3 inches. We possess hundreds of slides that transgress this rule, and, consequently, make it a matter of considerable difficulty to obtain the binocular effect.—EDS.]

### DR. VON ROHR'S THEORY AND HISTORY OF LENSES: AN APPRECIATION AND A PROTEST.

To the EDITORS.

SIR,—The high praise you accord to Dr. Von Rohr's recent publication in your review on the 24th ult. will be endorsed by every student of optics, and again, any one interested in the historical evolution of lenses must respect the great research involved in its compilation.

Although Dr. Von Rohr, as stated, is connected with the firm of Zeiss, of Jena, it is not difficult to discover that in the main he attacks the subject-matter in the true scientific spirit, but his departure from it in a few isolated instances makes this departure the more remarkable.

I am one of the few left who was intimately acquainted with the late J. H. Dallmeyer, and the contemporary history of his life and work. Dr. Von Rohr, as you say, denies to him great powers of originality; unfortunately Dr. Von Rohr does not stop here; he disfigures an otherwise dignified work by innuendoes of an uncharitable nature, that are both personal and incorrect, and are the more to be deplored, as that eminent optician and generous man thus referred to has been dead some sixteen years.

It is well known that a certain section of the press was hostile to J. H. Dallmeyer in his early work, while another was appreciative. Dr. Von Rohr has consulted but one side of contemporaneous history, but even from this source we could not have made certain of the innuendoes referred to. Where he obtained his information from, and his motive, if any, are subjects best known to Dr. Von Rohr himself.

I make this protest, not out of disrespect for Dr. Von Rohr's ability and honesty of purpose, as will be evident, but as a tribute of deep-seated respect for the kindest employer with whom I laboured in my early days, and also in sympathy with his son. I am certain that no matters of history could have been referred to Mr. T. R. Dallmeyer, which is astonishing, as this gentleman is still the head of the firm.

I have purposely avoided details; to translate these aspersions can serve no good end. Further, I may say that I have not one iota of interest in the commercial aspect of the photographic world; but, at the period at which I was connected with it, I am confident that no contemporary optician could deny the first rank to the late J. H. Dallmeyer for originality. To name but a few of his works that occur to my memory: I saw the launching of his patent portrait lens, the rapid rectilinear, the wide-angle rectilinear, and the wide-angle landscape lenses.

In conclusion, my object is not in any sense controversial—let the old controversies of thirty to forty years ago be investigated by those who are sufficiently interested to examine both sides—but to enter a strong protest, due to the memory of a man whose work still lives, and the influence of whose work will always live.—I am, yours, &c.,  
 195, Great Portland-street, W., December 6, 1899. WILLIAM CURRY.

### ACTINOMETERS.

To the EDITORS.

GENTLEMEN,—Two recent references seem to me to call for direct contradiction.

Mr. George Fernau in an article in your ever-welcome ALMANAC gives a series of tables for calculating enlargement exposures from actinometric observations which would, no doubt, be useful; but in his introduction he



asserts that "no instrument or mathematical calculation based upon it will permit of accurate reckoning the time of exposure required by day or artificial light for enlargements on bromide paper by means of a camera."

Now, for some years, the Watkins Standard Exposure Meter has been provided with the two scales for conjugate focus and density of negative, and an enlargement exposure can be calculated straight away on the slide rules at one calculation without reference to a single table. The scale is also extended for calculating exposures when copying, and the instrument is extensively used for both these purposes. It is a little amusing to see that Mr. Fernau copies the exact relative speeds of bromide papers, which are the result of my own tests, and are given on my speed card for use with the Watkins meter.

I am inclined to think that Mr. Ferrero is entitled to the credit of first calculating enlargement exposures with an actinometer. He worked out some tables for use at the Camera Club.

The second statement is in a summary on page 749 of the *BRITISH JOURNAL OF PHOTOGRAPHY* of a paper read by Mr. H. W. Bennett at the Royal Photographic Society.

"With regard to exposure, actinometers were of no practical value for interior work." As some readers may take this to be the consensus of expert opinion, I am bound to point out that the statement is contradicted by the fact that the actinometer is constantly used for interior work by scores of expert architectural photographers.

To give an instance: In 1897 the one medal for an architectural interior at Pall Mall was awarded to Mr. Harold Baker; in 1898 the medal for an architectural interior was taken by Mr. C. S. Baynton. Both these gentlemen are enthusiastic in their use of an actinometer for interiors, and used them for the medalled pictures. Mr. Bennett was an exhibitor of architectural subjects at both these exhibitions.—I am, yours, &c.,

ALFRED WATKINS.

Hereford, December 9, 1899.

#### PRINT-WASHERS.

To the EDITORS.

GENTLEMEN,—I can thoroughly corroborate what your correspondent, Mr. A. E. Stanley, says of Marion's sectional print-washer in your issue of December 1. I have had one in constant use for some time, and I find it the most convenient and perfect washer I have yet seen. It acts equally well for plates or prints, thoroughly washing them with a most economical expenditure of water and time, one hour's washing with this trough doing the work as thoroughly as three hours in the usual manner. It is a boon that I could not well dispense with now that I know it.—I am, yours, &c.,

A. M. MACDONA.

Halton, December 6, 1899.

#### ORTOL.

To the EDITORS.

GENTLEMEN,—I find no less than four letters in your columns on Ortol; but as I have no means of knowing to what extent they are merely weak attempts at humour, there does not appear much to pay attention to. If the letters signed "Jonathan Wideawake" and "Hendrich Salt" are attempted skits, they have not even the merit of cleverness. The latter gentleman should really learn German before he tries to write bad English. "C. E. F. N." and "Novice" do not appear to have troubled their wits very much. They both deem my formulae obscure, but, if they will turn back to page 711, they will find that I do not use the terms Solution No. 1 or Solution A at all, but I use the name of the chemical. It is very plainly and nicely printed in your paper. I will therefore ask "Novice" if he makes a solution of ortol, 1 ounce; metabisulphite,  $\frac{1}{2}$  ounce; and water, 60 ounces, how he is going to get 3 ounces of pure ortol out of it as he suggests? If he can, he will prove my argument that ortol is cheaper than pyro. Perhaps the bromide paper formula is not so clear as it might be, so I amend it to 1 ounce of ortol,  $\frac{1}{2}$  to  $\frac{3}{4}$  ounce of soda, 1 ounce of sulphite, 1 ounce of water, and 20 grains of bromide. The difference in the soda is  $\frac{1}{2}$  ounce for soft to  $\frac{3}{4}$  ounce for hard negatives. In all my writings I am not ashamed of my own name, and therefore decline to answer any more letters unless the writer feels the same way. Nor am I at all ashamed of my advocacy of ortol—the future will prove the truth of my assertions—and, if those who are endeavouring to make fun of me now will have the honesty later on to admit that I at least knew what I was writing about, then they can have as much fun as they like. The enormous interest taken in ortol of late, and the number of converts from pyro, very few would credit unless they were in my position.—I am, yours, &c.,

WALTER D. WELFORD.

To the EDITORS.

GENTLEMEN,—I am sure all your readers must be very much obliged to Herr Sapt for his supplementary figures to Mr. Welford's results.

My prejudices against the idea of the repeated use of a developing solution are being weakened by the prospect of being able next year,

perhaps, to do an entire year's work with "one lot of solution." But I am still in some doubt as to whether I may not have to add a little water from time to time during "die hottest days" so feelingly alluded to by mein herr Sapt; and, if this correspondent will tell us whether he added any water so as to get all his 9760 films wetted as well as developed with eight ounces of solution, it will save me and others some experimental work. Even if water has to be added for purposes of development, the only limit to the repeated use of the developing solution now seems to be the full maintenance of the Water Company's supply, which is sometimes a little short during "die hottest days." But, after all, no very large amount of water is wanted, so we ought to be all right for next year.—I am, yours, &c.,

S. HERBERT FRY.

12, South-villas, Camden-square, London, N.W.

#### ADDRESS OF A SCULPTOR.

To the EDITORS.

GENTLEMEN,—We should not forget our old friend Albert Toft of Manressa-road, Pimlico, who some years ago modelled the presentation bust of the President of the Royal Photographic Society, James Glaisher. It was an admirable likeness. He also produced a medallion, a copy of which graces the walls of my billiard-room. Mr. Toft has executed several commissions for me, which in every instance have given complete satisfaction. I need scarcely add Mr. Toft is a gold medallist, an exhibitor at the Royal Academy; his busts of W. E. Gladstone, Rowland Hill, and many others testify to his skill.—I am, yours, &c.,

A. L. HENDERSON.

Templestowe, Torquay.

To the EDITORS.

GENTLEMEN,—Enclosed is a mount from Mr. Forsyth of Finchley-road, N.W., who has lately supplied a memorial tablet erected in our parish church in memory of the late Canon Jeffreys, the tablet is of brown veined marble, moulded and ornamented with oak-leaf border and coats of arms with a circular profile portrait in white marble inserted, the portrait being composed from several photographs of the gentleman; the work is very satisfactory. Perhaps Mr. Forsyth could undertake the work that "W. D." mentions in your last issue. I do not happen to have a print by me of the tablet, but should be happy to send one to "W. D." if he would like one, as I have a good half-plate negative of it taken by magnesium ribbon, as daylight is so flat and weak where the tablet is placed. This is not a bogus affair such as Mr. Penlake writes of. The camera was raised on a level with the centre of the work.—I am, yours, &c.,

Highgate, Hawkhurst, December 7, 1899.

E. WILLIAMS.

[No doubt our correspondent is now sufficiently supplied with the addresses of sculptors who are prepared to execute work from photographs.—EDS.]

#### THE NEW OXYMAGNESIUM LIGHT.

To the EDITORS.

GENTLEMEN,—In the last two numbers of *THE BRITISH JOURNAL OF PHOTOGRAPHY* you make mention of a new method of artificial light for portraiture by Mr. Smith of the Platinotype Company.

Now, this system of burning magnesium ribbon in oxygen gas was introduced and, I believe, patented about fifteen years ago by Mr. McLellan of Glasgow, and a great number of the apparatus sold throughout the country by Mr. George Mason, who was agent for the invention.

The method for using the above was just the same as described in the *JOURNAL* with the exception that the magnesium was not lighted by electricity. Water was introduced into the oxygen globe, as Mr. McLellan found that the light was more steady when burned over water, also with a supply of air.

Enclosed is a rough sketch as near as I can remember of the old system. I have observed for upwards of forty years all the systems of artificial lighting for photography, and believe that the oxymagnesium is the most actinic light, and the best for taking instantaneous photographs.

Much praise to Mr. Smith for bringing the subject before the photographic profession.—I am, yours, &c.,

JOHN URIE.

9, Wood-street, Alexandra Park, Glasgow, December 5, 1899.

[We are much obliged to Mr. Urie for his letter and the sketch. The latter shows a gas-holder supporting a glass globe wherein the magnesium is burnt in oxygen. The principle of the system is, of course, not new, and in all applications of it to photographic purposes there must inevitably be some similarity of design; but in the Platinotype Company's apparatus there are many differences of detail as compared with the older forms, and, above all, the fact that the magnesium ribbon is electrically ignited.—EDS.]



## THE KODAK DIVIDEND.

To the Editors.

GENTLEMEN,—I have to inform you that the Directors have declared an interim dividend on the Company's Preference issue for the quarter ending December 31, 1899, at the rate of six per cent. per annum, and on the Ordinary shares at the rate of ten per cent. per annum for the same period, which dividends will be payable on or after the first proximo.

They have, further, resolved that the transfer books be closed from the 18th to the 31st inst., both days inclusive.—I am, yours, &c.,

T. HALLETT FRY, Assistant Secretary.

43, Clerkenwell-road, London, E.C., December 12, 1899.

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

## PHOTOGRAPHS REGISTERED:—

E. Ball, 30, Edward-street, Stockport.—Photograph of Colonel Wilkinson.

G. Denney, 1, Cary-parade, Torquay.—Photograph of E. F. Knight, war correspondent, "Morning Post."

\* A. T. DEANE.—A matter in which we cannot be of assistance, as it is against our rule to recommend one maker's goods in preference to those of another.

\* CHRISTMAS AND NEW-YEAR'S MOUNTS.—W. WAIN. Refer to the Advertisement columns for the last month or two, and you will find where you can get what you require. We do not recommend any particular maker's goods, whether mounts or anything else. It is quite against our rule to do so.

\* STAINED BROMIDE ENLARGEMENT.—W. W. N. If the stains came out within a month of your receiving the enlargement, it is clear that it was carelessly produced, and the enlarger must supply another free of charge or refund the money, which may be recovered in the County Court. We are surprised that any one should demur to replace a picture under such circumstances, even for his credit's sake.

\* INK STAINS ON NEGATIVES.—W. A. WHITING says: "Could you kindly suggest, in your Answers column, a safe remedy for removing ink stains?"—Without knowing the composition of the ink we cannot offer a suggestion. What would remove one kind would not remove another. If the stain cannot be got rid of by washing, the best way will be, as it is in the hair, to touch it out in the prints. Tampering with the negative may lead to its ruin.

\* WINTER PORTRAITS.—J. AND R. write: "Would you advise us as a business matter to make a feature of winter portraits—that is, portraits with wintry surroundings, like some we have seen from Canada and the States?"—Yes, if we are going to have a "good old-fashioned winter," then it might prove very remunerative. But, as we do not know what sort of winter we shall have, we cannot advise further. However, it may be well to be prepared with specimens and suitable accessories on the chance.

\* TITLES OF PROCESSES IN FRANCE.—AJAX says: "Can you tell me what is the process called 'Phototypie' used in France (and perhaps also in Germany)? Is it a modification of collotype? There are numberless processes for producing book illustrations—or rather names given to processes of reproductions—but I suppose they are all much the same. The German 'Lichtdruck,' for example, is, I suppose, a collotype of some sort."—In reply: By phototypie the half-tone engraving process is probably meant.

\* TRANSFERRING COLLODION POSITIVES.—POSITIVE says: "Will you kindly inform me how to transfer the film of a wet-plate positive (from the glass plate) to a metal surface. Is there any special collodion used?"—Simply immerse the positive in a dish of water to which a few drops per ounce of hydrofluoric acid have been added. In a few minutes the film will leave the glass and may be floated on to anything that may be required. It may be well to give the metal a thin coating of gelatine, allowing it to set, before floating the film on to it. It is advisable to use a rather thick and rough collodion.

\* COPPER PROCESS.—FINCHLEY says: "Customer orders a picture on copper, from negative of sitter. Can you suggest what process is required? On copper, not printed from copper."—If a print, simply, is wanted on the metal, it can easily be produced by the carbon process in the ordinary way; but the picture will be reversed, as regards right and left, unless printed from a reversed negative. It may, however, be made by the double transfer method, developed on flexible support, and then transferred to the metal. In this case the copper must have a substratum of gelatine to which a little chrome alum has been added.

WANT OF DENSITY IN NEGATIVES.—N. CONWAY writes: "I am now completing the development of a lot of negatives I took on my holiday in the autumn. I developed some a few weeks ago, but business prevented my doing the remainder at that time. Now I find that the image comes out very slowly and I cannot get sufficient density. Is this due to the long keeping or what, as I am using the same developer?"—It is probably due to the lower temperature we have now. Warm the dark room up to 65° or 70°, and use the solutions at the same temperature, and we have small doubt all will go well.

IRON DEVELOPER.—T. BATEMAN says: "I have bought a fresh lot of sulphate of iron, and made up a solution of it of the same strength I always make it for developing bromides. It seemed all right at first, but on standing for a day or two, a lot of the iron falls to the bottom of the Winchester, and the solution is so much the weaker. I got some more from another shop, and that has gone the same. What is the reason, as it has never done so before?"—The reason is that the solution, when made, is nearly or quite saturated with the salt, and cold has caused it to crystallise out. The remedy is, not to expose the solution to a low temperature after it is made.

SPOILT DAGUERRETYPE.—W. R. writes: "I had a Daguerreotype portrait, which is highly prized by its owner, brought to me to copy. It was very much tarnished, and I tried cleaning it round the edge with rouge on soft wash leather and it came off easily. Then I went over the whole picture with it and got off all the tarnish, but there is only a very faint trace of the portrait now. Please tell me in your next how to restore it, as it belongs to one of my best customers!"—We cannot nor can any one else. In clearing off the tarnish in the way you have done, you have cleaned off the image, and there is no known method of restoring it. The picture is irretrievably ruined.

STEREOSCOPIC PHOTOGRAPHY.—H. G. DOGGETT says: "In your most valuable article on Stereoscopic Photography in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1900, you refer on p. 674 to a form of stereoscope 'peculiarly suited for transparent photographs.' That particular form of photograph is my special hobby, and I should esteem it a great favour if you would be so kind as to tell me where I could obtain such a stereoscope as is indicated in the passage quoted."—In reply: The context of our article will show that the form of stereoscope referred to (a combination of mirror, prism, and lenses) was suggested by Sir Howard Grubb. So far as we are aware, it is not on the market.

PRESERVATIVE SOLUTION FOR P.O.P.—D. HALL says: "Some time ago (say three years) you published a solution—I believe it is called lemon solution for preserving prints, that were available for, say, a month or so—which I think would now be useful to me, as I occasionally have to print one copy, which makes it rather expensive for gold toning. Could I therefore so far trespass on your good nature as to ask you to oblige me with a formula?"—We cannot call the formula to mind, and the data, "say three years ago," is too vague upon which to start a search. It is not a very costly matter to make up just sufficient solution to tone a print as occasion requires, seeing that a couple of grains of chloride of gold or less is sufficient to tone a full sheet of paper.

HYPO IN THE DEVELOPER.—C. W. says: "Mr. Walter D. Welford, in his article on ortol as a developer, which ends in the last number of your JOURNAL, says: 'The use of a minute portion of hypo is a decided advantage. The action of the hypo solution is rather curious. Half the quantity appears to act just as well, and a little more does no good, whilst too much merely gives fog.' He also tells one that for developing bromide prints he does not think that the minute quantity of hypo would do harm, but rather recommends its being left out. He nowhere says what the action of the hypo is. Can you tell me?"—The hypo is said to act as an accelerator, but we ourselves have not tried it with ortol. Indeed, we never use it in a developer in our own practice.

ORTHOCHROMATIC PHOTOGRAPHY.—F. J. P. says: "I shall be very grateful if you can give me a little advice as to the use of isochromatic plates. Can you recommend me the best brand of isochromatic plates, and if a longer or shorter exposure is required when using the screen? Would these plates be the best for taking snow and mountain scenery, and, if so, would they be equally suitable for short exposure, such as street scenes, &c., and general landscape?"—It is strictly against our rule to recommend any particular maker's goods. Better get samples of the different brands on the market, and see which answers best in your hands. A longer exposure is necessary with a screen, the time depending on the depth of the colour. The plates will do quite well for ordinary work, without the screen. If the light is yellow, an advantage will be found in orthochromatic plates for snow scenes, &c.

STAINS ON PRINTS.—STAINS says: "I should feel obliged if you will kindly explain the cause of the stains on enclosed print. It is not till after mounting and burnishing that they appear, and in some cases the prints have got out to customers and been returned owing to their being like sample. I have not long been started in business, and have not had much experience in printing, having been operator and retoucher only. At first I thought it might be owing to using a dish in which a diluted solution of acid for platinum prints had been used, and in consequence I got a new set of dishes. The toning bath is the formula recommended for Barnet P.O.P., which paper I use. I might add that the fixing is done in a different room to that in which toning is done. My assistant washes the prints and fixes them, and I do toning. Since taking these precautions the stain has not appeared so far."—The stains on the prints sent are due to imperfect fixation where they are. The prints have been allowed to stick together while in the fixing solution, so that it has not had free action all over the print.



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## A GREETING.

It is our happy privilege to possess the personal friendship or acquaintance of thousands of the readers of this JOURNAL and its ALMANAC in all parts of the world. To these, as well as to the larger number who must of necessity only know us by the medium of print, we venture to send the heartiest greetings of the season. Though the nation is at war, the arts of peace still pursue the paths of progress, and it is with the most earnest hope for the prosperity of photography that we wish all interested in it

A MERRY CHRISTMAS AND A HAPPY NEW YEAR.

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC  
FOR 1900.

EDITED BY THOMAS BEDDING, F.R.P.S.

What some readers think of the book:—

- "Even better than its predecessors."
- "A remarkable publication."
- "Full of valuable information."
- "Useful and portly."

- "A lot of it—looks all right."
- "Ever welcome."
- "Most interesting and instructive."
- "I cannot understand how, in such a short time, you can complete such a stupendous work."
- "Much to enjoy in the present ALMANAC."
- "I daily enjoy the admirable ALMANAC."
- "I see several new features, whilst retaining the general familiar appearance, which if much altered would give the impression of another book. Good old friends are best kept."
- "The most wonderful publication for a shilling that I have ever seen. You deserve all the praise words can afford for so useful a work."
- "The ALMANAC is the best thing of its kind."
- "A work of monumental capacity."

## A few opinions of the Press:—

- "Well up to date. . . . an indispensable adjunct to the outfit of the photographer." *Morning Advertiser.*
- "Welcomed by thousands of photographers, trade and amateur, who have come to regard it as indispensable." *Newcastle Daily Journal.*
- "Welcome both to professional and amateur photographers." *Manchester Guardian.*
- "No photographer ought to be without it." *Shrewsbury Chronicle.*
- "Almost a reference library in itself." *British and Colonial Druggist.*
- "A work of which specialists have long known the value." *Glasgow Weekly Herald.*
- "A useful volume which no photographer should be without." *Kent Argus.*
- "Crammed full of all the very latest information." *Invention.*
- "A massive and remarkably cheap volume." *Birmingham Daily Gazette.*
- "There is nothing like it in the photographic world that we know of, either for bulk, or variety, or merit." *Western Mail.*
- "A very bulky volume at a very moderate price." *Gloucester Journal.*
- "The whole book is thoroughly practical." *Horse and Hound.*

\* \* The 1899 Edition of the Almanac (20,500 copies) was entirely exhausted within three months of publication—a fact without precedent in the history of photographic publications.

\* \* Of the 1900 Edition just issued nearly 17,000 copies were disposed of on the day of publication: an increase of between two and three thousand as compared with last year. It is probable that the entire edition will be out of print within a few weeks from date.



## EX CATHEDRÂ.

M. "TANQUEREY," of the Société Artistique de Portraits, Paris, undeterred by the searching attentions of the English press, is still engaged in widely distributing his free-portrait circulars in this country. Several batches of his literature have recently been sent us by correspondents. We append a copy of M. Tanquerey's "third advice," which is evidently sent to those people whom he finds a difficulty in persuading to buy one of his frames: "We beg to remind you, for the third and last time, that we are still without your instructions concerning your life-size crayon portrait, now finished for a long time. If you could only be here in our studio, and see the magnificent specimen we have turned out for you, you would not hesitate a minute in remitting us the eight shillings we have already asked you to pay for the necessary boxing, packing, and carriage expenses from Paris to your home. A crayon drawing cannot be compared with a chromo or a lithograph, it cannot be rolled up and sent by mail; on the contrary, in order to secure its safe arrival and prevent it from being scratched or rubbed, it must be carefully wrapped and boxed, when it is forwarded by the Express Company, who have a branch office in Paris. All this runs into expenses, which have to be paid in advance. We are sure that you do not expect us to defray these expenses for you in addition to making you a crayon portrait of nearly 18 x 22 inches large entirely free of charge. We know you to be perfectly fair, and that you will do what is right in this instance."

\* \* \*

BUT it is plain that 18 x 12 bromide enlargements (which are reputed to be made in this country) bear a handsome profit at eight shillings each, for M. "Tanquerey" is willing to take half that sum for them—if he can get it. Thus: "As we desire to close this matter at once, we make you the following offer, good for thirty days from date: Send us four shillings, for which amount we will forward you your crayon portrait carefully packed and boxed, and, if our work is to your satisfaction, you will please remit the balance of four shillings to our carriers. Should we be without an answer to the present communication within thirty days, we will take it for granted that neither your portrait nor your photograph are of any interest to you, in which case, and after said date, we will no more be responsible for either of them. Should you decide to send us the full amount of eight shillings at once with your order, we will make you a present of a splendid detective camera, which takes pictures  $4\frac{1}{2} \times 6$ , and deliver free of all charges to your home." We make M. "Tanquerey" the suggestion that, as the expense of communicating with his English clients and boxing and wrapping up his "magnificent specimens" is so great, he should open a branch in London. Then his clients would be saved the time, trouble, and expense of going to Paris to see these specimens and the splendid detective camera which he gives away as presents.

\* \* \*

LAST week Mr. Alfred Waterhouse, R.A., presided over a meeting to consider the past progress and future methods of "Scapa," as the Society for Checking the Abuses of Public Advertising is familiarly known to its adherents. Mr. Waterhouse deplored the conduct of advertisers who enrich themselves by defacement of this beautiful world, and he would appeal to all to bring their private conduct into a line with

their ideals, and to taboo the soap, pills, or what-not of those whose advertisements were an abuse of taste or manners. An encouraging report was submitted by the Hon. Secretary (Mr. Richardson Evans), who looked to municipal authorities for the chief abatement of the nuisance, whether it takes the form of disfiguring fields, forests, hill tops, or house fronts. The public opinion, created in large measure by the Society, had at last enabled Edinburgh this year to get Parliament to extend its powers in this direction, and the success of its appeal had encouraged several other municipal bodies to add clauses to their private Bills extending their powers over open-air advertisements.

\* \* \*

WE understand that the Eastman Kodak Company, of Rochester, N.Y., are supplying the American photographic public with daylight cartridges for Kodak work, containing rollable film for two or six exposures. This departure has been made to meet the requirements of the photographer who may wish to make a few exposures without using up an entire spool of a dozen exposures before resorting to development. It may be supposed that this new convenience in film photography will in due course be placed at the disposal of European photographers. In the States a cartridge containing sufficient film for six  $3\frac{1}{2} \times 3\frac{1}{2}$  exposures is retailed for thirty cents, or two cartridges, each containing two exposures = four exposures, may be had for twenty-five cents.

\* \* \*

SOME idea of the great use made of photography by the United States in the late war with Spain may be gleaned from the fact that, in reply to a circular sent out from the United States War Office to officers and men carrying cameras during the war, there have been received over 500 negatives and 300 prints of Porto Rican subjects, over 700 negatives and nearly 400 prints of Cuban and reserve camp subjects, and nearly 150 negatives of Philippine subjects, from which something like 350 Porto Rican, nearly 500 Cuban and a few Philippine subjects have been chosen to make the final selection for an album, and these negatives and prints were then returned to their owners. There are still on hand from which to make further selections over 200 Porto Rican negatives, 350 negatives and nearly 700 prints of Cuban and reserve camp subjects, and over 600 Philippine prints.

\* \* \*

IT is stated that "the work so far has been to make selections from the negatives and prints sent in, which are usually very small. The ones selected are then enlarged to the size of eleven by fourteen inches. After having been collected and enlarged, it is the intention to retouch these enlargements, and then make negatives from them for the purpose of making the final pictures. This is necessary on account of the small size of the negatives and prints received, and on account of the poor quality of most of them, as they had been taken under disadvantageous circumstances, often by persons inexperienced in the handling of their cameras. After as much material as can be obtained has been got together, the final compilation will be made. This work is regarded of importance, having already served to determine disputed questions. It is thought that in time the collection will be of such value as to induce Congress to publish it for distribution to libraries throughout the country."



No class of persons is so largely photographed as actors and actresses, and it is commonly believed that the desire to possess their photographs is so keen amongst innumerable members of the public that the footlight favourites are constantly being asked for copies. Our contemporary, the *Stage*, makes an excellent suggestion in connexion with the matter. It tells us that the well-known actor, Mr. Wilson Barrett, for a long time now, has always been willing to give his photograph or autograph to any one desirous of it on one condition, that the recipient should contribute something to the Actors' Orphanage Fund.

\* \* \*

"It is a good and generous action of Mr. Barrett, and we wish that all actors and actresses would do likewise. When the list of donations to the Actors' Orphanage Fund is published later on, you will find that the money given through Mr. Barrett for his photograph or his autograph." Our contemporary adds, that readers of the *Stage* in the provinces constantly are writing and asking where they may purchase photographs of certain favourite artists. Its advice is, Write to the artists direct, and suggest that the 5s., 10s., or 20s. sent with the letter for a photograph should, in accordance with Mr. Barrett's plan, be given to the A.O.F. And it adds that, if those pretty and fascinating ladies, whose photographs are to be seen by the hundred all over London, were to follow Mr. Barrett's lead, they would do much good to the Fund, and through it to the children of their late comrades in art. Come now, ladies and gentlemen of the profession, says the *Stage*, why not commence the New Year with the settled determination that, when your photograph is asked for, you will give it only on the condition that you receive money for it—money which you afterwards hand over to the secretary of the A.O.F.?

\* \* \*

We may remark that it is commonly supposed that actors and actresses do not pay for their photographs. This is an error, so that there is an additional reason why they should not be expected to give them away for nothing. Of course, the more the Actors' Orphanage Fund benefits by the sale of artists' photographs, the more profit will accrue to photographers (a not wholly undeserving class, we may remind the members of the theatrical profession), so that we hope our contemporary's suggestions will be largely availed of.

#### "PYRO" AS A DEVELOPER IN COLD WATER.

BE it by a kind of instinct or an intuitive sense of the fitness of things, whatever the cause indeed, the professional photographer generally blunders into, or stumbles upon, the right thing at the right time when that time arrives for a move forward. We say stumbles upon advisedly, for it must be admitted that few of those whose business in life is the utilisation of photography for portraiture or landscape give much time to experimenting, and of those few a still smaller proportion to exact experimenting; yet, as we say, they generally, to use a favourite scientific argot, seize the psychological moment when it arrives. The history of practical photography shows how the once-despised amateur did the laborious work of the laboratory and the professional walked in and took possession, and very often without the usual formula of acknowledging thanks.

Let us hark back to facts within the memory of many of our

readers. Time was when every one used iodised collodion and pyro developer. Within a brief period it was abandoned, and "bromo-iodised" collodion took its place, to be quickly followed by the abandonment of pyro for iron as the main developer. Equally sudden, when once started, was the change from the combined toning and fixing to the alkaline toning with a separate bath. At this time almost every one used Saxe paper. A well-known contributor once told us that when, after trying every kind of paper in the market and finding Rives infinitely superior to any, he, when placing his orders, was simply laughed at by his friends the makers, who said, "Nobody ever uses Rives." Yet who ever even hears of Saxe nowadays?

Coming to a later period, when emulsion photography and alkaline developer was devised, at a time when every portrait photographer and most landscape photographers in the land may be said to have used wet collodion, the same mysterious instinct gave warning that the moment had arrived, and with great dispatch baths were cast aside, and bottles of limpid collodion allowed to dry up into masses of horn. Oxalate of iron became the chosen developer; yet, before the novelty of the radical change of procedure from wet to dry had worn off, a wave of change passed over the land; iron developers were abandoned, and in virtually every dark room the developer was "pyro," and it has remained the favourite every since—at any rate, up to a very recent date. Excursions in the region of metal have been made, but few so far have taken to its general use, and some have announced their abandonment of it. It is not our purpose at the present time to say which is the developing agent we consider deserves the preference; we merely tabulate a few facts, and we abstain from self-laudation for the position in the van of progress that this JOURNAL has taken, as evidenced in the early days of gelatino-bromide.

Let us look at another aspect governing the choice of a developer, one, strange to say, that, all-important though it is, has held practically no position in the discussions upon the subject—we allude to the cost of the various developing agents. We are not aware that, apart from the question of using the same lot of developer for a succession of plates, any one has claimed that, weight for weight per ounce of water, any of the more modern developers will bring up the negative to sufficient density sooner than pyro; or, in other words, that an ounce of any one of them will make more quarts of developer of suitable working strength than would pyro.

That being the case, let us look at the price. What developing material, except pyro and hydroquinone, can be bought for a shilling an ounce, at which price these two are cheerfully sold? That is a dominant consideration, and exercises, perhaps unfelt, a dominant influence in keeping pyro at the top.

Hydroquinone at one time threatened to oust it, but, except among amateurs, the progress it once made has been arrested, and it has fallen back again in repute. The chief reason for its preference by amateurs is the fact that it does not stain the fingers anything like so readily as pyro, and this is an important consideration to those not professionally engaged in photography. The latter, as a rule, have always ignored any such fad as caring for stains—witness the "hands" we used to see in the "good old wet-collodion days." But is the use of pyro necessarily attended with stained fingers? We say no. We are about to give our readers a valuable tip: when dry fingers are dipped into any liquid, they quickly absorb, as it were, a portion of it, and it is very difficult to entirely free them from that absorbed liquid. So with pyro. But the bane



suggests its own antidote. Let the fingers before touching the developing solution be saturated with water by dipping them in it, and it will be found that, if every now and then they are again wetted with water, while occasionally fingering the plate in the developing solution, the stain will be reduced to a negligible minimum.

We will conclude by referring to one property of pyro often incidentally alluded to, but not yet to our knowledge exactly estimated, its amenability to the influence of temperature changes. We have heard from a contributor who has a series of experiments on this point in progress; and he estimates, subject to correction after further experiments, from indications already tabulated, that, after 55° F., a change of temperature in the direction of reduction needs an increase of five per cent. of the time needed at 60° for each single degree of temperature reduction! Our own experiments tend to confirm his estimate. Here is the key to a vast number of failures of "insufficient exposures," of "weak exposures," and so forth. The importance of this subject has not hitherto been grasped; but, contenting ourselves now with strongly calling attention to it, we must bring our article to a close with the promise that any more exact data obtained shall be brought forward in these pages as soon as available.

**Gold in Sea Water.**—We had thought that the last had been heard of the old fable of gold in payable quantity in the waters of the sea; but it seems that there still remain some believers in it, judging by the quest made by one of the *Daily Mail* reporters. Of course, we all know that there is gold in sea water; it is not many months since we published particulars of a thoroughly scientific examination of such water from various sources, but the quantity was so small as to render it an impracticable task to extract it without costing more than the product was worth. A reduction in the price of chloride of gold will not be brought about by auriferous oceans. The reporter referred to went down to Brighton, brought home a few gallons of ocean, and set to work to precipitate the gold therefrom by means of some wonderful preparation, the nature of which he was not allowed to divulge, but the name of which any of our readers used to residue-collecting could readily guess. He dumped into his few gallons of ocean two or three pounds, instead of an ounce, of his secret chemical, and obtained nearly a gallon of "sludge." This he took to an assayer of repute, who found it to contain '0031 of a grain of gold! If he had taken a thousand or two gallons of the water at Brighton, he would, at this rate, have obtained the munificent sum of twopence for the gold therein! He considers it is too early to express an opinion as to whether a projected company or syndicate could make by dividends by robbing the sea of its gold at this rate. Very possibly they may extract gold, but it would be from shareholders' pockets and not from the waters of the sea.

**Supposed Daylight Meteors.**—Last week we gave an abstract of some letters from Wiltshire and elsewhere which had been published through Professor Storey Maskelyne in *Nature*, the writers having described some star showers they had seen in broad daylight. In the current number of that periodical Mr. W. F. Denning pulls the accounts to pieces, and shows that the effects seen were not objective phenomena at all, but merely ocular illusions that could at any time be observed by any one looking intently at the bright sky for a few minutes. Mr. Denning writes: "It is astonishing that, if one calls the attention of people to imaginary phenomena of this kind, and asks them to look, they will, in ninety-nine cases out of one hundred, see the same thing and encourage similarly mistaken ideas. Yet, if we observe an unequivocal object, it is often very difficult to make others perceive it, and comprehend its character and the nature of the observation."

**A New Use for Röntgen-ray Photography.**—In a paper lately read before the Royal Society by Messrs. O. T. Heycock, F.R.S., and F. H. Neville, F.R.S., they described a method of making photographs of sections of particular alloys of gold they were experimenting upon. It consisted in using Röntgen rays instead of taking a negative by reflected light. The negatives so obtained were enlarged, and, say the writers, "the contrast between the Röntgen-ray photograph and the surface photograph of the same alloy shows what a much better picture of the structure of the alloy is given by the Röntgen rays."

**Novel Method of Thawing Frozen Water Pipes.**—The present is a very critical time for dark-room and printing-room operations. Every one is making strenuous efforts to get his negatives and prints through in time for Christmas; but it is an exceedingly well-contrived and organized place that is not interfered with by a long-continued and severe frost, which stops the water supply and arrests all printing work. Hence the plans described in *Science Abstracts* as being in successful operation in Canada will be of great interest. Alternating currents of electricity are passed through the frozen pipes, and usually, in a few minutes, the ice is thawed and water flows quickly through the pipes. A pressure of ten to fifty volts is used, obtained from a portable transformer connected with the street mains. A current of 200 to 300 ampères is passed through and the required effect is produced. Such a plan, if there are practical means of introducing the current, should, if it proved to be uniformly successful, be invaluable, for it often happens that the structural condition of a building in connexion with the water supply does not permit of the adoption of the obvious precaution of placing the pipes where the cold cannot find its way to them.

It must not, however, be forgotten that the stoppage of the water supply is not the only evil effect from frozen pipes, and when the water freezes it expands with such force as usually to split the pipe, and thus lead to leaks and floodings when the frost goes and the ice in the pipe melts, this, of course, being the explanation of the popular idea that it is the thaw that bursts the pipes. We have described from time to time many of the methods published or patented for preventing this bursting, but we doubt whether any are equal to Professor Apjohn's old contrivance for so preventing it. His plan was to solder into the exposed parts of the pipe at intervals (the shorter the better) short lengths of lead pipe closed at one end and open at the other. The water being turned off, these open ends are soldered against apertures in the supply pipe, and then offer a cushion of air for the expanding water to press against. The pressure is thus relieved, and, though ice is formed, its tremendous pushing or bursting power is prevented from acting, as it expends its energy in compressing the air in the chamber formed by the lead tube. The only thing that could militate against success would be the placing of the projecting tubes we are describing at so great a distance from one another that occasions might arise when the freezing water would, in two separate spots, shoot across the tube before the whole tube was frozen. The water would then be confined between these two ice barriers, and the "bursting charge" of frost have free play.

#### PHOTOGRAPHIC COPYRIGHT—AN APPEAL TO THE PHOTOGRAPHIC SOCIETIES OF THE UNITED KINGDOM.

We have much pleasure in giving publicity to the annexed appeal, which the Photographic Copyright Union is making to the photographic societies of the United Kingdom for their support in opposition to Lord Monks-well's Copyright (Artistic) Bill, which will probably be reintroduced to the House of Lords next session. We have already drawn attention to the fact on several occasions during the past year that that Bill proposes to substitute for the present Copyright Act of 1862, which has been found to work exceedingly well in the interests of photographic copyright, a measure alike unjust and spoliative in its provisions, and calculated to do serious harm to the photographic profession, as well as to amateur photography. We trust that the appeal for support now issued by the



Union will meet with a unanimous response from all the societies, so that the existing Act, in so far as it concerns photography, will not be interfered with by the Legislature.

### PHOTOGRAPHIC COPYRIGHT UNION.

*Affiliated with the London Chamber of Commerce (Incorporated).*

LONDON CHAMBER OF COMMERCE, BOTOLPH HOUSE, EASTCHEAP, E.C.

14th December, 1899.

The Committee of the Photographic Copyright Union invite the support (not necessarily financial) of the Photographic Societies of Great Britain and Ireland to oppose Lord Monkwell's Copyright (Artistic) Bill, which Bill will soon be for the second time before a Committee of the House of Lords. The enclosed petition draws attention to two important points which in our opinion every one who practises photography, whether as an amateur or as a professional, should strongly oppose. The drafting of this Bill has been prepared and printed without consultation with any Photographic Society or photographer. Therefore it behoves every Society to examine with careful attention its various clauses. Major-General Waterhouse, on behalf of the Royal Photographic Society and the Solicitor and Committee of the Photographic Copyright Union have already, before the Select Committee of the House of Lords to whom this Bill has been referred, offered evidence against it, and strongly protested against its passing into law.

The Committee of the Photographic Copyright Union appeal for support to all Photographic Societies to assist in strengthening their opposition on the reintroduction of the Bill next Session. In the present Act of 1862 the very production of a photograph made without valuable consideration enjoys Copyright, whereas in the proposed Bill no Copyright can be had unless the subject be registered within six months after date of production. Considering the enormous number of negatives taken by photographers, this compulsory registration is manifestly a great injustice.

To show how this would work out, one of our members informs us that a sitter to whom he gave a complimentary sitting some years ago, but did not think then that the portrait was of sufficient importance to register, has now become a world-wide celebrity, and his portraits consequently are of great value. Had the proposed new Bill been in force, this valuable copyright would have been entirely lost, but, by simply registering under the provisions of the Act of 1862, the entire rights and profits of the copyright are still reserved to the photographer.

It is extraordinary how little the artists have recognised the value of photography in a commercial sense. No consideration has apparently been given to the fact that the financial interests of photography are vastly greater than that of all the painters and sculptors of the country. It is therefore thought desirable that every photographer, amateur or professional, should protest against the exclusion of their valuable interests and the depreciation of their status.

We therefore beg that your Society may see fit to send us their written protest against the passing of this Bill until due consideration has been given to the interests of photographers. We suggest that the President and Secretary be authorised on behalf of your Society to sign the accompanying protest.

For the Committee,  
HENRY GOWER,  
Secretary.

[FORM OF PROTEST]

We, the members of the \_\_\_\_\_ Society, respectfully approach the Select Committee of your Lordships' Right Honourable House on the Artistic Copyright Bill, and beg to submit to your Lordships our protest against this proposed Bill.

We consider that by expelling Photography from the Fine Arts, in which it has always been classed since the Act of 1862, a slur is cast on Photography which is quite unaccountable, seeing that Photography is now of far greater importance than in 1862, and has, since that time, made marked advance in Artistic qualities in all classes of Photographs, Portraiture, Landscape, and Composition.

We also consider that Clause 16, making it compulsory, in order to secure Copyright, that every photograph must be registered within six months, failing which the Copyright is to be void, would be a very great hardship to Photographers. To carry out the conditions of this Clause would entail a very heavy tax, because millions of photographs are produced every year. We therefore respectfully suggest that the conditions as to Copyright and Registration of Photographs shall remain the same as in the Act of 1862.

There are various other objections to this Bill, but these two points, Classification and Registration, are those to which we most strongly object.

(Signed) \_\_\_\_\_ Chairman.

(Signed) \_\_\_\_\_ Secretary.

Date.....

### FOREIGN NEWS AND NOTES.

**Pyro Development.**—In Dr. R. E. Liesegang's paper, *Der Amateur Photograph*, an article is published concerning pyro development which is well worth consideration. After pointing out that pyrogallic acid was the favourite developer with the wet-plate photographer, and was followed by ferrous oxalate, hydroquinone, eikonogen, and the aniline derivatives, the writer alludes to the fact that photographers are returning to pyro, and that this tendency cannot be due to pure conservatism. R. E. Liesegang has often referred to the compound nature of the image formed by pyro development, the negative being composed of metallic silver *plus* stain. This almost eliminates the risk of over-exposure. On the other hand, pyro is recommended by manufacturers of shutters as the best developer for instantaneous work. These two extremes suggest that pyro is probably the developer giving most latitude. The writer of the article recently photographed a fresco painting, and gave four days' exposure at  $f/32$  with a deep orange screen. The light was good. A window, glazed with ground glass, was in the field of view, but, notwithstanding this was immensely over-exposed, a good negative was obtained, the window being as truly rendered as the fresco painting. An old oxidised pyro developer, with which six other plates had been developed, was used. In cases of over-exposure, a stale developer is recommended. Bromide of potassium merely retards, but stale pyro corrects. The following question was recently asked by Dr. Seitz, "Should development be adjusted to exposure, or exposure adjusted to development?" The writer answers: "In studio work, where the exposure can be accurately timed, the latter should be made to correspond with the developer, which should be very energetic. By such means the exposure may be reduced, and time saved in development. In work, however, where violent contrasts of light and shade exist, the development must be modified and suited to the exposure."

**Mercuric Intensification.**—In the *Photographische Mittheilungen* Dr. E. Vogel discusses the question, How long should plates be washed when subjected to mercuric intensification? It is usual to recommend very thorough washing when this process is undertaken in order to avoid subsequent deterioration of the negative through yellow stains. Dr. Vogel holds that these stains may be traced to imperfect fixing, and that, if this process is thoroughly carried out, five to six minutes' washing in running water prior to the mercury bath is ample, unless the plates have extremely thick films. After the plate has been bleached, a second washing for five to six minutes will suffice before transferring it to the ammonia bath; but the second washing may be reduced to half a minute if sulphite of soda be used instead of ammonia. To facilitate the removal of the bichloride of mercury from the film, it is desirable to add common salt to the solution of bichloride of mercury. It also expedites the solution of the bichloride of mercury. The following proportions are given:—

Bichloride of mercury .....	20 grammes.
Common salt .....	40 "
Water .....	1000 c.c.

The salt renders the addition of bromide of potassium to the bath unnecessary. It has a similar effect and is less expensive. It is very desirable to keep the bichloride bath in an acid condition by adding hydrochloric acid until blue litmus paper is turned distinctly red. This will keep the solution quite clear. The formation of a white deposit indicates that the bath has become alkaline. The deposit has a tendency to adhere to the film, and is then difficult to remove.

**Discoloured Platinotypes.**—The paragraph by Mr. E. W. Hawes, which appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY on September 22 last, calls forth a comment from the editor of the *Photographische Mittheilungen*. Mr. Hawes attributes the yellowing of platinotype prints to the action of the acid bath, and recommends a neutralising bath of soda. The editor of the *Photographische Mittheilungen* doubts if the change of colour is due to hydrochloric acid. From his experience he attributes it to traces of platinum salts, which may be left behind even after careful treatment with acid baths and subsequent prolonged washing. Discolouration is associated more particularly with paper sized with gelatine, while paper sized with arrow-root rarely shows the defect after careful treatment. Gelatine has a well-known tenacity for various salts.



**A Copyright Question.**—*Le Moniteur de la Photographie* publishes a very interesting decision, which has recently been given in the French law courts. Clara Ward, otherwise known as Princess de Chimay, sat to P. Nadar, of Paris, for her photograph, and paid the usual charge. She also gave him permission to use the photograph commercially. The editor of the *Nouvelle Revue Parisienne* applied to P. Nadar for permission to reproduce the photograph on the cover of his paper, as he was about to publish an article relating to the Princess. P. Nadar refused, and the editor then obtained permission from the Princess de Chimay. The *Revue Parisienne* was seized at the instance of P. Nadar, and legal proceedings were instituted. The case involved further points, as the *Revue Parisienne*, although a Parisian paper published in Paris, was printed in Belgium. The judgment was in favour of P. Nadar upon all points, and right of publication must therefore be obtained from the photographer, according to French law, even if the sitter has paid for the photographs.

**The Colour of Transparencies.**—There is a short account in the *Photographische Correspondenz* of some experiments made by Dr. Eder concerning the colour of the image upon chloro-bromide plates as affected by the nature of the light to which they are exposed. Edwards's plates and hydroquinone developer were used. The light of a paraffin lamp and ordinary daylight favoured blackish tones. Incandescent gaslight, under otherwise similar conditions, tended to brownish tones. This seems to indicate that the chloride is more affected than the bromide by exposure to incandescent gaslight, which is richer in violet rays than the light of a paraffin lamp. The maximum sensitiveness of chloride of silver is nearer the violet end of the spectrum than that of bromide.

**Peroxide of Hydrogen.**—The *Photographisches Wochenblatt* gives an abstract of a paper read by Dr. Andreesen at the Berlin Photographic Society concerning peroxide of hydrogen as a developer and a reducer. Like hydroxylamine it has the properties of a developer, but it must be made strongly alkaline by adding two molecules of caustic potash to each molecule of peroxide of hydrogen. Although the fact is very interesting from a theoretical point of view, as it presents the apparent anomaly of an oxidising substance acting as a developer, whilst it confirms the law of the atomic construction of developing agents, it is, nevertheless, of no practical value, because oxygen is liberated and riddles the film with small bubbles. For use as a reducer hydrochloric acid should be added to the ordinary commercial three per cent. solution. It first attacks the densest parts of the negative, and, as it also dissolves the gelatine, it forms a strong relief.

**Platinum Toning.**—The *Gazette du Photographe Amateur* publishes the following toning process, recommended by M. A. Courrèges, for very rich, warm, black tones. The following solutions should be prepared:—

No. 1.	
Water .....	500 grammes.
Borax .....	10 "
No. 2.	
Water .....	500 grammes.
Chloride of gold .....	1 gramme.
No. 3.	
Water .....	1000 grammes.
Chloro-platinite of potash .....	1 gramme.
Phosphoric acid .....	10 grammes.

A few hours before toning, mix 60 grammes of No. 1 with 60 grammes of No. 2. The solution should be neutral when used. This may be ascertained by the colour, as the yellowish tinge, due to the chloride of gold, should be discharged. Keep the bath after use as stock solution, and make fresh additions to it for each batch of prints. The prints should be well washed before toning in the gold bath, and they should be removed from the latter as soon as the high lights turn grey when examined by transmitted light. Rinse them in two changes of water, and carefully drain them to avoid diluting the platinum bath, No. 3, which should then follow. Fix and wash in the usual manner.

**Erythrosine and Bichromate Films.**—The *Photographische Chronik* mentions that the sensitiveness of the bichromate processes may be considerably enhanced by the use of erythrosine.

As an instance, it mentions that the exposure of an ordinary collo type plate was reduced to an hour and a half in bad winter light whereas in the ordinary way it took two and a half days to print under the same conditions. Similar results have been observed with photo-litho paper and the fish-glue and albumen processes.

**The Paper Ring.**—We also notice in the same paper an extract from the *Papier Zeitung*, which states that O. S. Greenleaf, of Springfield, Mass., has bought the Springdale Paper Mills at Westfield, Mass., and, with the assistance of J. B. Mumford, who has studied the manufacture technically in Germany, will organize them for the production of photographic papers. The experiment is supported by the American trade as a means of combating the monopoly of the Steinbach-Kléber combination. The factory will produce 2500 kilos daily.

#### MR. HENRY STEVENS AT THE CAMERA CLUB.

The little band of photo-fakers which makes so much noise in its efforts to convert pictorial photography into a thing of shreds and patches knocks in vain at the doors of the Camera Club. They are "not taking any" in Charing Cross-road. Landscapes false in tone values, topped by clouds whose relationship to the rest of the picture is distinctly antagonistic, would not be regarded, we imagine, by the seven or eight hundred educated gentlemen who constitute one of the most enlightened photographic assemblies in the world with the same feelings as the raw and credulous provincial amateur. Vamped-up travesties of nature, accompanied by a whirl of meaningless words, may pass as pictorial photography with a not very exalted order of intellect, but a careful scrutiny of the one and an analysis of the other soon reveal meritriciousness allied with verbal vagueness. In other words, "fake" can only deceive the ignorant.

Only a few weeks ago Mr. E. R. Ashton occupied the large room at the Camera Club with an exhibition of Egyptian scenes produced by unfaked photography, and he has been succeeded by Mr. Henry Stevens, who for many years past has been noted for his beautiful studies of flowers, the outcome of a most intelligent handling of lens, dry plate, and printing surface. On the present occasion Mr. Stevens also shows us a number of flower studies, and we have besides human and animal portraiture in extensive variety. Always recognised as having as complete a command over successful dog and cat photography as over the properly gradated delineation of flowers, Mr. Stevens comes forward in the unfamiliar rôle of an exponent of child portraiture, and scores an undoubted success. A charming child, with a most expressive face, forms the subject of a good many of his photographs at the Camera Club, and the variety of poses in which Mr. Stevens has succeeded in representing the graceful little lady, amidst home surroundings, show him to be the possessor of a very wide range of photographic skill indeed.

Then we have a large number of cat, rabbit, and fox-terrier studies of a most lifelike character, skating scenes, costume portraits, fancy heads, and other subjects. Mr. Stevens perhaps shows to most advantage in the studies of the little girl and the portraits of the animals (who look a very happy family indeed); but the work, photographically regarded, is strong throughout, that is to say, the poses have been well chosen, the lighting is generally natural, the exposures adequate, the printing well and carefully done, and having a richness and depth which is a treat to contemplate in these times of a mild epidemic of measly gum bichromates and other rubbish.

Mr. Stevens is quite the Briton Riviere of photography. Pictorially regarded, his work is interesting and unforced; in the technical sense, it supplies a valuable lesson in what is best in photographic manipulation. Such work is not for a day, but for all time. It can be "lived" with.

The photographs will be on view till the end of January, and we hope that the Camera Club will arrange other exhibitions of good photography produced by men who are sincere in their work, and whose interest in pictorial photography is not of that commercial kind which manifests itself in what the French happily term the *réclame*. The best workers in photography allow their work to speak for itself.

#### ON SAVAGES, ADVERTISEMENTS, AND THE ALMANAC.

In spite of our boasted civilisation we are but savages yet. We pride ourselves on being eminently practical, and look on all sentiment as childish; but, for all that, our instincts, call them savage or childish as you please, will assert themselves.

So I said to myself when Jones dropped in the other night, as I saw



him turning over the pages of the ALMANAC. Now, you must know that Jones is pre-eminently practical, he has a reason for everything he does; he is an authority on optics, and what he does not know about chemistry is as yet unknown. His negatives are always done to a turn, they are invariably perfect in gradation and definition. I hope you have gathered from this what kind of a man Jones is. Well, when he got hold of the ALMANAC, he looked it through as any child or savage would have done. Holding the weighty volume in his right hand, he opened the front side of the book, which most people ignorantly call the back, I generally call it the back myself, much to the disgust of my bookbinder, who must be tired of explaining that the back is not the side, but that part which is seen when the book is on the shelf; he reads there a few words, "With the Editor's Compliments," which makes Jones envious of me, then his savage instincts get the master of him. No, he does not put the book under his arm, he could not put it in his pocket if he was to try, he has not one big enough, and rush away with it. If he did so, I should have to turn savage too, and put out my foot to trip him up before he got off my carpet. No, he bends back the fifteen-hundred-and-sixteenth leaf with his left thumb, and quickly turns the rest of the leaves over towards the beginning, stopping only when he gets to page 634—stops as a child or a savage when he sees a pretty picture, then after a good long look he skims away to page 1.

Mind, I was watching him carefully all the time and was anxious to see what he did next. I expected he would turn to the contents index, like a learned man, but no, he started again at the end, going this time rather slower, he stopped a second at page 1427, and again at 1272 and 1271. When I said, looking at the old salt, "Is that beyond the pale?" he gave a grunt. The savage again, you see, and turned on, not to stop again till page 1114; then he flew along to 1018, then to 954. This seemed to fetch him very much; then to 890, next to 826, then to 765 and 764 and 762, then away he went to 730 and stopped again at 634. At this I could not help laughing outright, for he had been looking at the pictures.

After Jones had gone, as I sat thinking how childish and savage such a learned man had shown himself, it seemed as if a ray of hope shone forth for those of us who try to make pictures. At present pictures are a drug on the market for they are of no use; but it really seems as if pictures were at last to be both useful and ornamental. If advertisers, wide-awake men every one of them, find that pictorial advertisements catch the eye and arrest the attention when plain type or blocks fail to do so, why, then there will be a demand for pictures.

There are people, however, who pretend that they never look at advertisements, pictorial or otherwise; but such beings, if there are any, cannot be unaware of the existence of such things.

Some years ago I took in the —, a paper which had very few advertisements. Then I began to reason with myself. This paper cannot be a good one, it cannot be healthy, its circulation must be bad, or more people would advertise in it. So I looked about for another and found one with more advertisements, a paper which I have subscribed to ever since, and which teaches me more than ten times what the other one did. Evidently the advertisers are able to smell out what is good.

Speaking of advertisements, I do not remember having seen in any paper such telling advertisements as have been appearing in THE BRITISH JOURNAL OF PHOTOGRAPHY during the past twelve months. I allude to Wellington & Ward's Signs of the Zodiac, designed by Walton & Co.

Some people say they throw away all loose advertisements. I have collected all these, and have made a frieze of twelve of them round my office, giving the place of honour to Aries.

It may be that pictures supply a want which our boasted civilisation feels the need of. Now that countless thousands are unable to hold that close communion with nature which their ancestors enjoyed, it may be that, no matter how learned a man may be, or how many letters he may have after his name, he will always stop instinctively at the sight of a picture. The better the picture, the longer he will stop. That must be why Jones looked so long at the picture in the ALMANAC—which is placed where pictures have been put in the ALMANACS for the past I don't know how many years—at that place where the advertisements end and the literary matter begins.

The ALMANAC does for us what we should otherwise have to do for ourselves. It condenses the past year's photographic progress as an ox is condensed into a jar of meat extract. When I began photography I borrowed the BRITISH JOURNAL for the previous twenty years, and condensed those twenty volumes into one, indexed one for my own use before I ever took a negative.

ZWITTAU.

## THE CHEMISTRY OF PHOTOGRAPHY IN RELATION TO DEVELOPMENT.

[A Paper read before the Edinburgh Photographic Society.]

To have a correct understanding of what happens—that is, what chemical change occurs—when the developing solution is poured upon the exposed plate, it is necessary, first of all, to inquire in what way the plate has altered by the exposure in the camera; and to this end I would wish to bring before you the behaviour of the halogen salts of silver when brought under the influence of light, giving, at the same time a short account of some experiments I carried out in this direction during the past summer.

There are numbers of substances which undergo either a chemical or physical change when exposed to light. Of the former (chemical change) the reduction of such salts as ferric chloride into ferrous chloride in presence of oxidisable matter may serve as one example, while for the latter (physical change) yellow phosphorus becoming in sunlight red or amorphous phosphorus is sufficiently familiar. Of such there is no time to-night to deal; rather let us confine our attention to the text of this part of the subject, and consider only the salts of silver and the photo-chemical changes brought about by the action of light upon them. It is well, however, to notice—and photographers might be apt to overlook the fact—that other substances besides salts of silver are, as I have said, changed by the sun's rays. It may be stated broadly that all silver salts are changed by the influence of light; some of the salts require the presence of other bodies to effect the change, some do not.

The silver compounds with which the photographer has mainly to deal are the nitrate, chloride, iodide and bromide of silver. The last three salts are called the halogen salts of silver, or silver haloids. It is with these that we are specially concerned to-night.

Now, to have a clear conception of the matter, the properties and appearances of each of the three salts must be examined, and their mode of formation understood. A mixture of the haloids must also be made and critically examined. Then all must be exposed to bright sunlight, and the photo-chemical change noted. It is the last part of the investigation that has puzzled so many observers, for we are brought face to face with that most mysterious thing, the latent image.

I do not presume—and I want to emphasise the statement—to offer a solution of the matter. All I can do is to report to you the chemical investigations I have conducted during the past brilliant summer, with the hope of adding a little to our knowledge on the subject and stimulate investigation, and likewise to bring before you the views of other workers in the same direction and the conclusions they were led to make.

Let us begin with the chloride of silver. It is an elementary fact to the student of chemistry that, when a soluble chloride is added to a solution of nitrate of silver, a white precipitate of chloride of silver is produced—formula  $\text{AgCl}$ . It was known even to the alchemists that on exposure to light this substance became dark in colour.

In the early part of the late summer I prepared a quantity of chloride of silver, and exposed it under water to the brightest sunlight for some days in June. A brownish-violet product is the visible result (which I have in this bottle), but another change at least has occurred. A certain photo-chemical decomposition has taken place—the original white chloride of silver has, during the process of darkening, lost some of its chlorine. This chlorine I found, by several chemical tests, in the water above the precipitate. The question now is, what insoluble compounds of silver remain? An answer to this question would go far to explain the composition and properties of the latent image. Now, precipitated chloride of silver is readily soluble in a solution of ammonia. If, therefore, the darkened chloride is treated with ammonia, nearly all the precipitate disappears, but a dark flocculent residue is left, which is not soluble in this reagent. The quantity left undissolved is so minute that it may not be possible to demonstrate it as an experiment, especially at night. The eminent Swedish chemist, Scheele, stated that this insoluble residue is metallic silver, and, it is said, he proved it to be so by dissolving it in nitric acid, which is a solvent for that metal.

I have endeavoured to repeat Scheele's investigation. The darkened chloride before referred to was treated with ammonia, and any insoluble matter allowed to deposit, and the supernatant fluid carefully decanted and residue washed with pure water until quite free from soluble silver salts. The minute black residue was next treated with nitric acid, in which it readily dissolved, but on the addition of hydrochloric acid no precipitate was produced.

The negative results indicate the absence of silver in the residue. What the latter is I have not yet determined, but purpose making a special investigation with large quantities of chloride of silver. I made another research to ascertain if the coloured chloride contained metallic silver. You are aware that mercury readily forms an amalgam with gold and silver. Now, if mercury be added to the darkened product, and the latter contains elementary silver, one would expect to get this amalgam, which could readily be examined for silver. The addition of mercury was made under various conditions, but I failed to re-establish the white colour of the original silver chloride; indeed, it was not possible to detect any outward and visible change in the latter. The mercury, on the other hand, was also examined for silver, and I obtained clear indications of its presence. The black residue, which, presumably, is the cause of the change in colour of the exposed chloride, does not appear to be metallic silver, but yet it is some body which unites with mercury. Were it silver, then the loss of the halogen and the reduction of the salt to metallic state are represented by a very simple chemical equation,  $2\text{AgCl} = 2\text{Ag} + \text{Cl}_2$ , and the developing process is capable of ready comprehension. The nature of the composition of the darkened chloride has given rise to much controversy. The view held by many is that the change is due to the formation of a new substance which they call subchloride of silver, having the formula  $\text{Ag}_2\text{Cl}$ . They argued in this fashion: If chlorine is given off when chloride of silver is exposed to light and becomes dark in colour, and that this darkening takes place even in presence of nitric acid, as I have proved it does, though not so readily, indicating it is not



metallic silver that is formed, then what can the darkened substance be but subchloride?

There is no doubt on one point, viz., the darkening is not due to an allotropic condition, as may be seen in the case of phosphorus, but a true chemical change has occurred and chlorine has been lost. Why, then, should the violet body not be a subchloride? To prove that the white chloride on exposure actually does lose an appreciable quantity of chlorine, I took 100 grains of pure crystallised silver nitrate and precipitated the silver by hydrochloric acid, and washed the precipitate repeatedly by decantation with pure water, exposing it during all the time in exceptionally bright, sunny weather. It was then dried. The resulting chloride of silver by theory should have weighed 84.41 grains. I obtained only 83.64 grains—difference, .77 grain. There is a limit to the loss of chlorine and the darkening; if this were not so, the difficulties of working with minute quantities of the altered compound would disappear, and the problem would be thus less difficult to solve. I exposed the chloride in flat porcelain trays for days on end to the sun, but a stage was soon reached when the chloride no longer darkened, and when the chlorine dissolved out in extremely minute quantities.

It would take us rather far to give chemical reasons against the view that a subchloride of silver is formed; but it seems to me that chemical theory and analogy are against the supposition, at all events, that the reduction product is represented correctly by the exceedingly simple formula  $\text{Ag}_2\text{Cl}$ , though I do not for a moment say that it may not be. Before going farther with this subject, let us glance for a little at what the father of photography discovered in regard to the sensitiveness of the silver haloids and the development of the latent image—I refer, of course, to Daguerre. Let me recall the principles upon which his process rests. A perfectly clean and burnished silver plate, or copper plate electro-plated with silver, is sensitised by exposing it to the vapour of iodine in a box until the whole surface of the plate receives a thin coat of silver iodide—subsequent investigation showed that a second treatment, this time with the vapour of bromine, greatly increases the sensitiveness. A few seconds' exposure in the camera is all that is required, and the development is effected by exposing the plate face downwards to mercury heated in a box to a temperature of about  $50^\circ \text{C}$ . As in other development processes, the progress must be watched and the correct depth reached. The image is fixed with solution of thiosulphate of soda, as with the plate used to-day. The theory of the development is that the reduced silver haloid—i.e., the reduction product—whatever exact chemical compound it may be, has an affinity for mercury—at least, mercury has some kind of action on it. The image is quite invisible before the addition of the developer, and this is the great point brought out by the discovery of Daguerre—a latent image that is visible only after development. The Daguerre plate may be developed with either an acid solution of sulphate of iron, as a wet plate, or with pyrogallol. It was proved later that the silver plate so coated is more sensitive than a washed collodion plate; there is, therefore, some sensitiser present in the former which is not in the latter, and this was believed, and is proved later, to be metallic silver forming a salt with the liberated halogen. The solution of silver nitrate in the wet plate acts in the same way. Wash the wet plate and you diminish the sensitiveness enormously, for by so doing you remove the absorbent or sensitiser. It is stated that a change in the structure of the exposed Daguerre plate has been observed. The altered product is somewhat powdery, and is capable of being removed by rubbing.

Now let us return to the appearance and properties of the silver haloids, for the one brought before you (chloride of silver) is not always used in photography.

It may seem strange that the image on the plate after exposure is invisible, but on reflection this will not be so mysterious for two reasons: first, because a very minute quantity of reduction product is formed; and second, because, as I shall show you, pure bromide of silver is much less, and pure iodide of silver scarcely at all, darkened by light.

Here is some of the latter (iodide of silver). This sample has been exposed to the sun's rays about the same time as the chloride, and see how little it has changed from the pale yellow colour it originally had. One hundred grains of pure nitrate of silver, when precipitated with potassium bromide and then exposed to bright light, gave 110.08 grains of bromide of silver, while theoretically I should have got 110.58 grains, or .5 grain less than theory, showing bromine is lost. In the same way, iodide of silver was prepared from 100 grains nitrate, and, while theory shows 138.23 grains, I obtained only 137.06 grains.

In presence of an absorbent for the halogen, the decomposition of the salt of silver is more readily effected. To show that, I exposed both the bromide and the iodide of silver to bright light in presence of a solution of silver nitrate, imitating to some extent what happens in the wet plate. You will observe the exposed products are visibly darker than these where no absorbent was present.

Now, collodion is not a halogen absorber, but gelatine is—so that, when, say, bromine is given off during the exposure of the plate, it is greedily taken up by the gelatine in intimate contact with it. This helps to account for the extreme rapidity of the modern gelatine plate.

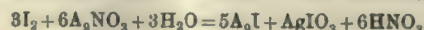
The degree of darkening of the silver haloids must not, however, be taken as a measure of their sensitiveness in the photographic sense, and it is somewhat curious that of all the haloids the most sensitive in this respect is the iodide, which, as we have seen, is the least visibly affected by light.

Here is still another view as to the constitution of the darkened product, and a certain amount of countenance is given to it by Meldola and others; this is that an oxychloride is formed,  $\text{Ag}_2\text{OCl}_2$ . Against this view we find Mr. Cary Lea, who proved that the reduced body contains no oxygen. Another investigator showed that the former was stable at the fusing point of the silver chloride with which it is associated (see *Journal of the Chemical Society*, pp. 537-1891), and it is assumed that stability is not a characteristic of an oxygen compound of silver.

Let us now look for a time at the theory of development, which, if viewed in the light of the reduction product being metallic silver, admits of ready comprehension.

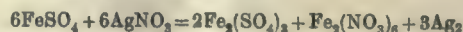
Meldola defines a developer as a substance which exerts an action upon those portions of a photo-sensitive compound which have been exposed to light different to that which it exerts upon the unexposed portions. What is the invisible image? It is believed to be of the same chemical composition as the darkened products. It consists, therefore, of the unaltered haloids along with a small amount of the reduction products—that some of the halogens have been expelled from the original salts as they existed before exposure, and have been absorbed by some body present which may be called the sensitiser, and the rapidity of the plate greatly depends upon the affinity between the absorbent and the absorbed.

Take the case, again, of the old wet plate. Here the sensitiser is the solution of silver nitrate, which readily reacts and forms definite chemical compounds with the iodine or bromine liberated during exposure:—



Again, take the once familiar tannin dry plate. Here the sensitiser is the tannin; and, lastly, the gelatine acts in this way in the plate of to-day, the sensitising action being due to their affinity for the free halogen.

The developer commonly used with the old wet plate was an acid solution of sulphate of iron. Now, if to a solution of nitrate of silver we add some ferrous sulphate, a dark-coloured precipitate of metallic silver is soon produced, the ferrous salts being at the same time oxidised to the ferric state. According to the equation



the action is too rapid, and a developer so used would speedily fog the plate. To avoid this, acetic acid or some other restraining agent is added, and the deposit of silver is more slowly and gradually thrown down. This is precisely what is required in a developer. The deposited metal adheres to or combines with the decomposition product, and a picture is thus formed by accretion of the molecules. The action is cumulative, and the negative gains in density as long as it is supplied with fresh silver. This is an example of acid development; the use of an alkaline developer for this is quite inadmissible. The development of the wet plate is a surface development, for the silver salt is on the top of the film.

What is essentially required in a developer for the wet plate is a reducing action on the nitrate of silver and no action on the unaltered silver salt, along with this a restrainer must be present.

Another developer very familiar to us all is pyrogallol. Now, the great property of this substance is its intense affinity for oxygen, and its powerful reducing effect on salts of silver and gold. If we add a solution of nitrate of silver to pyrogallol, a precipitate of metallic silver is very speedily produced, but the action is so rapid that fog would result, and, to retard this, bromide of potassium is added as a restrainer, the retarding effect being due to the formation of a more stable double salt with the silver, which is less rapidly reducible than the bromide of silver alone. In this way the reduction to the metallic state of the unaltered iodides and bromides is much more slow. You will here observe a very marked difference in the action of the two developers. The sulphate of iron has no tendency to reduce the unaltered silver haloids, but only the silver nitrate in solution on the wet plate, and this deposited silver, as we have seen, accumulates upon the reduction products. The alkaline pyrogallol solution, on the other hand, reduces the insoluble silver haloids as well as the soluble silver nitrate to the metallic state, and on this account it requires restraining by bromide of potassium. At the same time it must be noted that the reduction of the altered halogens takes place before the unaltered group, and this is the reason of the action of the alkaline pyro on the latent image taking place before the former.

Another well-known developer is ferrous oxalate. It acts much in the same way as alkaline pyrogallol—that is, as a strong reducing agent. The oxalate is really a double salt with the formula  $\text{K}_2\text{Fe}(\text{C}_2\text{O}_4)_2$ , and is prepared by the double decomposition of one molecule of ferrous sulphate and two molecules oxalate of potash.

The chemical action of this developer is as follows: The ferrous salt is oxidised to the ferric state  $\text{Fe}_2\text{O}_3$  by the bromine from the reduction product, and the latter is in turn reduced to metallic silver. In the acid development the image is built up on the surface of the negative, but in the alkaline development the reverse is the case. The picture is sunk into the gelatine, and this is caused by the newly reduced silver from the reduction product being capable of taking more silver from the unchanged silver salts in the emulsion in immediate contact, and in which it is imbedded.

This fact accounts for the sinking of the image in the gelatine film, the supply of silver coming, in the first place, from the reduction product,



but after that it is added to by growth from below. If, therefore, the gelatine negative be treated with nitric acid to remove metallic silver, the impression is left sunk into the emulsion. With acid development this is not so, the image simply disappears in nitric acid. How the unreduced haloids are acted upon by the silver during development is not fully made out, but the action is believed to be an electrolytic one, and it appears there are some good grounds for this belief.

It must not be overlooked that not only the sensitive silver salts take part in the development, but also, and very largely, is the sensitiser a factor in the case.

In the gelatine plate the intimate mixture of the gelatine with the silver salts, resulting as it does in a semi-inert condition of the latter, permits the use of strong developer for these plates, and in this way we are able to work with minimum exposures. Without the presence of the protecting gelatine, which acts as a kind of envelope and retards the action, these strong developers would speedily reduce the haloids direct to metallic silver with disastrous results. As an amateur photographer who began his work with wet plate, tent, and stand, and all the inconveniences attending them, a scorching sun and fitful winds added to the misery; the latter had a habit of upsetting not only the tent and all its contents, including the whole-plate bath, but even the amateur tied inside. In those days it did require some enthusiasm to prosecute the art. Now all is changed. No developer need find its way into the sensitising bath, no tent is required, and the development may be conducted ten thousand miles from the subject, and many months after the event. What a boon this is to all photographers, and not a little is due to the extreme suitability of the present-day alkaline developers. J. B. READMAN, D.Sc.

#### THE ELEMENTARY PRINCIPLES AND PRACTICAL USES OF THE PHOTOGRAPHIC LENS.

A LECTURE on this subject was delivered to the Thornton Heath Polytechnic Photographic Society by Mr. F. O. Bynoe, on Tuesday, December 12.

In his opening remarks he pointed out the importance to every photographer, whether professional or amateur, of some acquaintance with the construction and working of the most valuable element in his apparatus, whereby he could ascertain what to expect and what not to expect from its working. It was almost impossible to obtain these necessary details from books, and he must warn his hearers that, though much thought had been expended upon the perfecting of lenses, they were still more or less imperfect, and must be dealt with accordingly.

The first division of his syllabus being "The action of the lens in producing the photographic image," Mr. Bynoe referred to the possibility of producing an image by means of a mere pinhole, and, by the aid of a diagram, demonstrated the collection and subsequent distribution of the rays of light by this method. The advancement in speed of action was, however, shown to be due to the introduction of a lens, whereby a much larger volume of light could be concentrated on the plate, and its action thereon consequently accelerated. Though not necessary for practical purposes, it had been proved that, in so minute a space of time as the  $\frac{1}{1000}$  of a second, a photographic image had been secured.

Proceeding to his second division, "Something about light," the lecturer stated that no theory entirely explained all its phenomena, but the theory that it travelled in transverse waves was universally admitted, and this motion was illustrated by a most ingenious mechanical slide constructed by Mr. Bynoe. Darting through the luminiferous ether, which pervaded our atmosphere and possibly the whole of space, as well as most of the apparently solid bodies, the waves of light travel in all directions, and (unless deflected by intervening media) in straight lines, and, as shown by the wonderful rays from the fixed stars, they were eternal when once they had commenced their course. When they came into contact with any material object, the rays were either reflected, as from the surface of a mirror; dispersed, as from an object not having a polished surface; or absorbed, as by an object having little or no power of reflection. These phenomena were not only lucidly illustrated by carefully drawn diagrams, but by the deflection of the lantern rays by a mirror, and by their practical disappearance when projected upon a dull black card. This was followed by other diagrams showing the bending of the rays when they were passed through various transparent media, and the peculiar action of the prism, not only in diverting the rays into a new direction, but in dispersing and decomposing them into the colours of the spectrum, was shown by means of a second lantern and screen. The white rays were first seen in a direct line with the lens; a prism was then interposed, and the spectrum appeared in all its beautiful gradations, which, being again collected by another lens, reappeared in their original form. This demonstration was highly appreciated by the audience, and elicited loud applause.

By the process of refraction it was seen that the red rays changed their line of direction the least, and the violet the most, the red rays having the slowest vibratory motion and the violet the most rapid. For photographic purposes the red and yellow rays were of little value, the green and violet being the most important, but a proportion of yellow

light was also necessary for illumination. A properly corrected lens was therefore necessary to secure what was known by opticians as the effective chemical focus. Proceeding to the consideration of "the lens and how it does its work," by the aid of further diagrams Mr. Bynoe showed that every lens might be taken as consisting of a series of prisms, and exhibited sections of the double convex, the convex plane, the meniscus, the concave plane, and the double concave lenses, illustrating, by means of lines, the faculty of each form in converging or diverging the rays of light that passed through them. But the mere form of a lens did not suffice to accomplish colour correction, therefore it was necessary to combine different qualities of glass, flint glass having a higher dispersive power than crown, and by the combination of the two in certain forms an achromatic lens was constructed, and a practically perfect focus obtained. The theory of focussing was next considered, and illustrations were given of the crossing of the rays of light as they passed through different sections of a lens, creating what is known as the caustic curve. This produced a spreading of the focus, and, if not reduced to a minimum, would cause a blurred image. This led to the consideration of what is known as spherical aberration, and, by drawings upon a black-board, Mr. Bynoe essayed the difficult task of explaining this point, showing that, every lens being a portion of a sphere, the optician had not only to contend with direct but oblique rays of light, and therefore must adjust his lens in such a manner that all the focal lines were properly directed into a true focus. He then demonstrated astigmatism, by withdrawing from the lantern one of the combinations, and projecting the light through what might be described as a badly corrected lens, whereby a diagram consisting of a number of radiating lines, bearing other cross lines, was shown upon the screen. The alteration of focus caused the radiating lines to be seen to be sharp, while the cross lines were blurred, and, when the latter were corrected, the former became indistinct. The change back to the properly corrected lens secured a practically perfect focus for the test diagram, though a very slight blurring was still evident at its extremities, which suggested to Mr. Bynoe to remind his audience that absolute perfection in a photographic lens had yet to be attained, and that, as it was so difficult to correct for all errors, the present lenses must be accepted as the best compromises that opticians could give them.

The causes of distortion of the image were then discussed, and the effects of barrel and pin-cushion distortion shown by diagrams, with their neutralisation by the combination of lenses known as the rapid rectilinear. The construction of wide and narrow-angle lenses was also demonstrated, and the lecturer proceeded to explain what was meant by the curvature of field, stating that all lenses were more or less subject to that fault, and that in this particular a compromise between extremes was all that could be at present effected. The value of stops was then commented upon in their effect in assisting the lens to efficiently cover the plate, thus securing clear definition at the edges. The consideration of depth of focus naturally followed, and it was shown that the correction of lenses with that object in view had again to be accomplished only by compromise. Stopping down increased the depth of focus, so that the sharpness of all objects at varying distances could be thereby attained; but, as that advantage was counterbalanced by diminution of light, the time of exposure must be extended. In photographing interiors or other motionless objects time was not generally of importance; it was therefore desirable in such cases to stop down to the utmost possible limit.

Mr. Bynoe said that, as no one lens was universally applicable to all subjects for the best results, a proper selection of the lens to be used in certain cases was desirable. The impression on the plate depended almost entirely on the relation between the diameter of the lens and the length of its focus, and, as that was varied and regulated by the stops that were used, it explained the meaning of the figures with which they were familiar— $f/4$ ,  $f/11$ , &c. For their guidance in the selection of lenses he would certainly advise a portrait lens for perfect portraiture, and a rapid rectilinear for architectural or other work where the preservation of upright lines was necessary, but for general landscape photography he considered that a single lens of good quality was quite sufficiently satisfactory. Every optician was aiming at the production of lenses with as flat a field as possible, and for copying objects with a plane surface the flat field was essential, but it was not always so useful for ordinary work. He would therefore conclude by advising amateur photographers not to be discouraged by the lens they possessed, but to persevere in endeavouring to gain perfection by patient experience, and he trusted that his remarks on that occasion would assist them to make progress in the desired direction.

#### NOTES ON OZOTYPE.

At a meeting of the Leeds Camera Club, on Wednesday, December 13, a lecture was given by Mr. Thos. Manly, on "Ozotype," of which he is the discoverer. Ozotype is an important development in carbon printing, the essential difference being that in this process there is a visible image, while in the ordinary form of carbon working there is none. The image is printed on the transfer paper, and the tissue is then brought into contact with it. The print is formed by the chemical action of certain salts with which the transfer paper is coated. This solution is protected by letters patent, and will be shortly on the market. Any pure



paper may be used, and is evenly coated with the sensitising solution, and dried in the dark. It will keep well for a month or six weeks if kept dry. It is placed under the negative in the ordinary way, and the image is clearly and distinctly visible of a brown colour, and printing is stopped when faint detail in the high lights is visible. The image is much more distinct than it is in platinotype. The print is then well washed, and in this state can be put aside for an unlimited time, and subsequent operations conducted at leisure. A piece of ordinary carbon tissue, insensitive, is now placed in an acetic solution of—

Water .....	40 ounces,
Glacial acetic acid .....	80 minims,
Hydroquinone .....	30 grains,
Glycerine .....	1 drachm,

and allowed to remain about a minute. The print is now plunged under the surface of the solution, brought into contact with the carbon tissue, and quickly withdrawn. Squeegee the two surfaces together, and allow to dry. It is then developed as a carbon print, giving a correct image, while the ordinary single carbon transfer gives a reversed image. The subsequent print is in every respect equal to any carbon print, with the advantage of possessing greater softness of outline and perfect half-tones. The prints may be coloured instead of being pigmented with the carbon tissue by using a colourless salt of aniline, strongly acidulated with sulphuric acid, pleasing and brilliant colours obtained, and, with subsequent treatment by ammonia and other oxidising agents, different colours produced at will.

### ARCHITECTURAL PHOTOGRAPHY.

BEFORE the members of the Kingston-on-Thames and District Photographic Society, on the 11th inst., Mr. C. H. Oakden, President of the South London Society, delivered an interesting lecture upon "Architectural Photography."

Referring to apparatus, he considered a square camera with good rising front and swing back the best to use, and, if possible, the camera should be altered so as to permit of the dark slide being inserted from either side, which he found a great convenience when working in a confined space by the side of a wall. Speaking of lenses, he objected to the use of wide-angle objectives, excepting in very special cases, upon the ground of exaggerated perspective. April and August he thought the most suitable period of the year for cathedral work. With a good light, using stop *f*/32 and a Castle plate, an exposure of a quarter of an hour would be about correct for an average aisle. For all interior work he recommended slow plates, rich in silver, which should invariably be backed, as a safeguard against halation. As a further antidote against this bugbear of the architectural worker, he recommended a full exposure and quick development. He had, he said, tried all the modern developers, and was of opinion that none of them could beat pyro and ammonia, which he preferred to make up in ten per cent. solutions. For printing, nothing, he considered, was more suitable for architectural subjects than warm carbon or sepia platinotype, though a pleasing warm black might be obtained on the hot bath black paper by exposing to the steam from the oxalate bath for a few seconds before development.

At the conclusion of the lecture Mr. Oakden showed about a hundred slides, which fully sustained his reputation as an architectural worker of the front rank.

### IS COLOUR PHOTOGRAPHY POSSIBLE?

A LECTURE ON "Photographic and Mechanical Modes of Reproduction" was given by Mr. E. H. Micklewood at Plymouth Institution on Thursday, December 14.

The lecturer greatly interested photographers present by his lucid explanation of styles of mechanical art printing, in which photography played a part. In speaking of the collotype printing he incidentally remarked that the humid atmosphere of Plymouth was especially adapted for the process. Referring to the question of the possibility of colour photography, the lecturer expressed the opinion that it was no nearer than when photography was first discovered. The art would never be reached, because colour was not an objective which could be photographed, but was subjective, depending on the action of the human brain. Colour was a matter of so many vibrations per second, and how was it possible for a sensitive surface to have the capacity of permanently recording the varying vibrations? It seemed to him inconceivable that such could be achieved. There were, however, some wonderfully clever ways of introducing colour in which Nature herself did a great part of the work, but the colour had to be supplied even in that method. Ives had succeeded in making colours appear, but he had to take three positives of the original object, after which an instrument was used by which the light filtered through red, yellow, and green glasses. Ives had admitted that colour photography, properly so called, was as far off as ever.

The lecture was admirably illustrated by specimens of art printing.

In the discussion the President (Mr. H. M. Evans) remarked on the rarity of lectures on art in connexion with the Institution, although art

was one of its objects, and that all felt specially gratified at the clever lecture that night.

Mr. R. Smith disagreed with the lecturer's physiological reason concerning colour photography. It was true, colours were subjective in the mind, and were produced by relative rates of vibration, but he thought the same vibration would produce the same colour to any person except where there was colour blindness.

Mr. C. Lane said, from his point of view, the lecture was one of the most interesting he had listened to. Regarding colour photography, he was inclined to think that at the present moment there was no hope of being able to photograph Nature in its true colours.

### LIGHTING: ITS IMPORTANCE IN PHOTOGRAPHY.

#### II.

IN a previous article reference was made to a few branches of photography, and the important part which lighting played in connexion with same.

In commercial work, especially in these days, when so many different articles have to be photographed for the purpose of process blocks being made to illustrate trade catalogues and other similar productions, there are numerous varieties of what may be classed small objects for which special methods of lighting are required, and in not a few instances some of these can be treated quite as successfully by the aid of artificial light as would be the case with daylight, and, since the almost universal introduction of the electric light in our large towns and cities, it is largely employed by process workers, for the special reason, no doubt, that it is available at any moment. There are, however, on the other hand, articles innumerable in which daylight is distinctly preferable to any form of artificial lighting; and, still further, it will be found that some articles, strange to say, are best treated by a combination of both.

A by no means uncommon class of articles that have to be photographed is that of silver coins and medals, in which the great aim is to bring out the inscriptions and design in the strongest possible relief. Some writers in the past have advocated this being performed by the round-about method of taking plaster casts from the original, such casts being effected either with the aid of plaster of Paris, or sulphur, or even the homely stick of good sealing-wax. To my mind, this method entails a needless amount of trouble, and seldom yields a sufficiently sharp image, certainly by no means so clear cut as when the original itself is employed, providing it has been properly placed *in situ*, and lighted so as to bring into bold relief the form and inscription such contains.

Small coins and medals are apt to give trouble from reflections quite as much as larger objects, so that special provision has to be made to avoid these nasty visitors, and hence it has been suggested that the surface of those articles should be treated with some compound, such as putty, &c., when the light surface will become deadened and the reflections avoided. Silversmiths, however, as a rule, strongly object to this application to the extremely fine surfaces they produce on their articles, and the writer knows of one instance in which a very valuable silver ornament was greatly damaged in the hands of a careless photographer connected with process work, who evidently little knew the risk he ran when applying such a compound to a highly burnished silver article.

In point of fact, there is really no need to resort to such measures to overcome reflections in many cases. Isolated instances may be found where it is almost impossible to get rid of such visitors without an application of some kind to the surface, but these are few and far between, and an experienced silversmith can generally give valuable suggestions to any photographer in this direction, and, if necessary, prepare the articles for him.

In dealing with such articles as medals and silver coins, the burnished surfaces of them can frequently be dulled by immersion in a small quantity of ordinary toning bath, i.e., acetate of soda and gold, provided the coins are well brushed out with clean soap and water. It is, however, much to be preferred that all tampering with those articles be avoided, and, whenever possible, reflections be overcome by means of a well-devised system of lighting, and copying the same with long-focus lenses.

Some small articles may be successfully photographed through a long box or tunnel, the sides of which are lined with black velvet, thereby allowing only a vertical light or top light falling on them. A long box having about six inches of its one side cut out answers for this purpose admirably, provided the box be placed in an outside situation and no direct light be allowed to enter the open end, where, of course, the camera is made to face the object. The box thus practically becomes a miniature studio.

Other articles, such as those having a highly enamelled surface, can be well treated without any preparation, by lighting them with reflected light entirely. This form of lighting is best done by artificial light, the article being placed *in situ* in front of the lens. Two powerful paraffin lamps are placed at equal distances on each side of the object, but in the rear of it, and sufficiently to each side as to be outside the field of the lens. In front of the object being photographed are placed two slabs of plaster of Paris, or, at a pinch, two large sheets of blotting-paper tacked to suitable supports. The light from the lamps



strikes the white surface of these reflectors, and is thereby, by means of irregular reflection, caused to light the surface of the enamelled object, and, if the disposition of the lamps and reflectors is carefully adjusted, there will be no trouble from surface reflections, and articles thus lighted are easily photographed by means of ordinary paraffin lamps.

Articles such as china plates and valuable crockery ware likewise require special treatment in lighting. Sometimes work of this description can be got over more satisfactorily when very high-class results are required by applying to the makers of the articles, who will always be only too glad to provide the same pattern in an unglazed form, but, of course, this in many instances is not possible, for old china and similar articles cannot be duplicated in such crude forms. I once photographed for book-illustration purposes a number of these articles, and found that, by a special method of lighting them with daylight in an ordinary room furnished with one window, I was master of the situation. These china plates were placed *in situ* against a velvet background, stretched upon a stout box that sat easily on a table, the box carrying the object was placed right up against the window; in this position the plate appears very dimly lighted, but, the moment reflected light is thrown upon it by means of two white reflectors placed at each side, the plate instantly becomes beautifully lighted and free from reflection.

Those readers of THE BRITISH JOURNAL OF PHOTOGRAPHY who are anxious to execute work of this description should try the following simple experiment, from which much may be learned regarding what can be effected by means of reflected light alone: Let an ordinary dinner plate be placed against an opaque object such as a stout board or box, placing it, say, five feet from the window on a table, so that the plate, when standing on its edge vertically against the box, faces to the inside of the room, or, in other words, when being photographed the lens points straight against the light. After the plate is placed in this position, two pieces of white cardboard are made to throw light by reflection on the plate, one from each side at similar angles. The moment the reflectors are brought into position, that moment the most minute detail in the design of the plate will spring into view, and it is easily photographed without any troublesome reflections, *provided the foreground is prepared with a non-reflecting surface* such as any ordinary dark woollen material, and care be taken to have no bright brass fittings on the camera front. This may be accomplished by cutting a small hole in the focussing cloth, just sufficient to allow of the lens working through it, or, stated simply, when there is nothing to cause reflections, none can be present.

In all copying operations lenses of the longest possible focus should be used. The reason for this was described by the writer in THE BRITISH JOURNAL OF PHOTOGRAPHY some time back.

Other articles require special methods of lighting by reason of their particular shape. In this class may be mentioned delicate skeletons of animals, birds, and fishes, and in this kind of work the difficulty generally takes the form of avoiding objectionable shadows from one part of the object falling upon another portion of it.

In cases of this description much will be found to depend upon the form of the particular objects being dealt with, and, if artificial light be used, it should be diffused through muslin screens, or even ground glass. In almost every instance, however, some provision will require to be made so that the background is able to be placed at some distance behind the object. With dark-coloured objects, white backgrounds, when placed close up, are certain to yield eyesores in the form of shadows, which, of course, must be avoided. These can sometimes be overcome by placing the object being photographed against a sheet of glass having holes drilled through it. By this means almost any object can be held *in situ* against a transparent screen, which will not appear in the negative; and also some articles can be attached to such transparent supports by means of marine glue, and, when a suitable background is placed at a sufficient distance behind these sheets of glass, no eyesores in the shape of shadows will be apparent.

Another class of objects which sometimes give trouble are transparent objects like glass globes containing botanical specimens and suchlike. As a rule, these are best treated by photographing them direct against the light, when, by placing a muslin screen or sheet of ground glass between the window and the object, good results will be obtained.

In all inside work, no matter what the object be that is being photographed, there is always a *best method of lighting* to employ, and it should be the aim of every photographer to reason out in his own mind what that method really is.

Another very difficult class of subject is found in large metal discs or plates bearing designs or inscriptions. Among these may be instanced memorial brasses. These are, by reason of their weight, difficult to handle, and but seldom met with in really suitable positions as regards surroundings and light. Whenever possible, they are best treated exactly as oil paintings, *i.e.*, by lighting them with a very high top light and standing the object vertically.

When this is not available, they may be done by reflected daylight, after the manner described for articles having an enamelled surface like china plates, only greater attention must be paid to the reflectors, seeing the surface is always of considerable extent, and the main point is to equally illuminate the same. A case of this sort recently came under the writer's notice, where, by reason of faulty lighting, much trouble was

experienced in bringing out, even with the utmost care in printing, the fine engraved lines forming the beautiful design of the brass.

If so much thought is required in the lighting of objects indoors, outside subjects offer quite as much scope for the exercise of thought, if any particular effect be desired in the resulting picture.

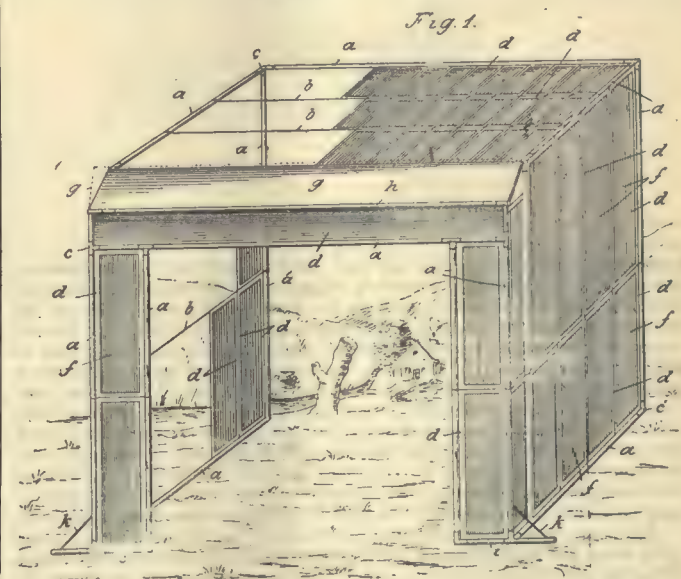
In the early days of photography—*i.e.*, in dry and wet-collodion days—in landscape working, sunlight was deemed a *sine-quâ-non*, but now, with our rapid plates, all this is changed, and it is impossible for any hard-and-fast lines to be laid down as to the best light to employ in landscape work. So much will depend upon the taste of the worker and his striving to delineate some particular effect in light, and shade, and atmosphere, all of which come under the cloak of what is now termed pictorial photography.

T. N. ARMSTRONG.

### A PORTABLE STUDIO.

HERR SCHAEZTKE has devised a portable studio which shall be capable of being made available, in a very short time, for the taking of views or portraits, whether in confined spaces or in the open, and which shall also be capable of being as easily taken to pieces for transport. Further, to render the taking of views or portraits entirely independent of the state of the weather or the light, by the employment of a special arrangement of parts, so that the operations may take place either by daylight or by artificial light (electric, acetylene, magnesium, and so on), or even with a combination of daylight and artificial light.

Frames composed of iron or wooden (or, say, bamboo) rods, easily detached one from another (and which, in some cases, may be strengthened at the corners by cross pieces), are secured, on two sides thereof, to a skeleton framing, which is made to rest securely upon the floor or ground surface by means of suitable feet. In the three vacant sides of the so-formed three-sided chamber, cross wires are fixed, and upon the latter (always in accordance with the actual amount, or desired amount, of light) are hung a certain number (more or less) of light frames, covered with wire gauze or other suitable medium, said frames being capable of being moved sideways as required. If the operation is not to be effected



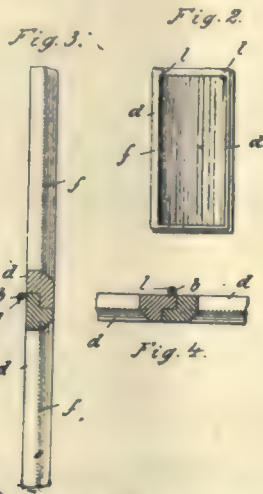
by daylight, there will also be provided, preferably below the frame forming the roof, a reflector or mirror suspended at an angle, and capable of angular adjustment, so that a portion of the light desirable from a source outside the chamber shall be thrown in a suitable manner upon the object, and another portion be available for the required front lighting.

The photographic chamber will, for the principal part, be formed of three main frames only, the separate parts of which consist of rods, *a* (say, for example, bamboo canes or the like), which are secured in a suitable manner, either horizontally or vertically, and across the frames formed by the rods, *a*, are attached wires, *b*. The connexion of the parts, *a*, of the framework may, for example, be effected conveniently by means of tubular T or angle pieces, *c*, or in any other suitable manner; it must, however, be so effected that the said parts, *a*, of the framework shall be capable of being quickly, and without much trouble, taken apart, in order that the whole apparatus may be stored with ease in a comparatively small space. The framing which forms the roof of the chamber is, in like manner, formed of rods, *a*, and here also two parallel rods are connected together by means of wires, *b*. These wires, *b*, serve not only as regards the vertical side walls of the chamber, but also as regards the roof,



for the securing or holding of frames, *d*, which are covered with a material through which light can pass, such as wire gauze or the like, as seen at fig. 2. The sides of the frames, *d*, which abut against each other, are rabbeted, so that, when they come together, they make a perfectly close joint. The formation of the rebate may be of different kinds, but, by way of example, the most simple kind for horizontal and vertical abutting edges is shown at figs. 3 and 4, in order to make it possible to employ a side light for the illumination of objects to be photographed. It is advantageous, as may be seen from fig. 1, to provide, at the front portion of the chamber, a reflector or mirror, *g*, which will be capable of turning on a hinge, *h*, so that the same may be altered in position in accordance with the amount of light which it is desired to admit. In order that the chamber so fitted together may stand securely and rigidly, it is advisable to provide the lower ends of the rods, *a*, with feet, *i*, which rods, *a*, near the angular connecting pieces, are also provided with wire struts, *k*, or the like.

If, for the illumination of the object to be photographed (as shown at fig. 1), it is desired that the light shall arrive from the left-hand side, whilst the right side is to be thrown into shadow, the frames, *d*, shown at fig. 2, will be suspended on this right side. These frames carry, for this purpose, at their upper and lateral edges, hangers or hooks, *l*, which take over the wires, *b*, in order that they may be held securely in place. By means of similar hooks, *l*, the frames, *d*, shown in fig. 1, on the right-hand side, will also be suspended upon the wires, *b*, and will also be



correspondingly fastened on the roof of the chamber. It is possible, therefore, by employing a greater or less number of frames, *d*, which are also laterally adjustable, to protect, for example, the right side of the chamber against the entry of light, and thereby to maintain the shadow portions more or less dark, whilst on the left-hand side (according as more or fewer frames), in the same manner, are hung up or otherwise, a smaller or greater amount of light for the illumination of the object may be allowed to enter, and thus it is possible to obtain the desired artistic effect in a far better manner than with glass-houses or rigid structures. By altering the position of the reflector, *g*, the aforesaid illumination can be materially increased in the way well known. Instead of the frames covered with wire gauze, similar frames provided with reflecting surfaces may be suspended, either inside or outside of the chamber, at suitable spots.

At its rear end the chamber is kept open, so that the natural landscape may serve as a background when photographing a person or other object. The operator will also be able, when erecting the chamber, to adapt the position thereof to the situation of the sun at the time. If, instead of natural light, artificial illumination is to be employed, it is possible to close in all sides of the chamber, or only a portion thereof, with the frames, *d* (placed together, and one over the other, or in several layers), in order to obtain the requisite lighting effects; or light from an artificial source may be brought into requisition, in addition to the natural light, in accordance with the effect desired to be produced and the particular object that is photographed.

#### TOMBSTONE PORTRAITURE.

MR. E. CHATHAM has devised a frame for photographs on tombstones. Here is his description of his invention:—

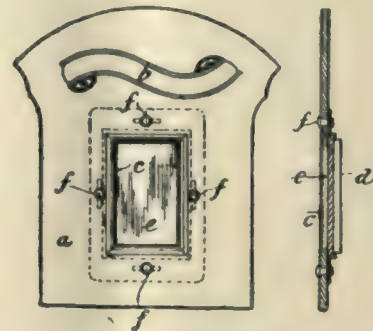
"I construct a frame of any suitable metal or material which will resist the action of the weather, and attach it in any suitable manner to the tombstone or the like. I place in this frame a photograph or portrait of the deceased person, or a number of such photographs or portraits where more than one person is buried in the same grave.

"The frame may form part of the tombstone, cross, wreath, or shade, or may be a separate part fitted thereto, or carried by a standard or standards, or other independent support.

"The body, *a*, of the frame shown in figs. 1 and 2 is made of porcelain, or earthenware, or of any suitable metal or material. Near the top is a scroll, *b*, on which any suitable epitaph, text, motto, or heading, can be moulded, printed, or otherwise produced.

FIG. 1.

FIG. 2.



"In the middle of the body an opening, *c*, is formed to display the photograph or portrait of the deceased person, with or without an inscription, such photograph or portrait being held in a white metal or other frame, *d*, covered by a sheet of glass, *e*, and fastened to the body, *a*,

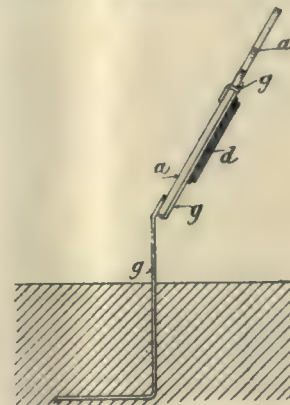


FIG. 3.

by studs, *f*, or other suitable fastenings or equivalent devices; or instead of having an opening in the porcelain body, and attaching a metal frame to the back, the opening may be dispensed with, and the metal frame attached directly to the front.

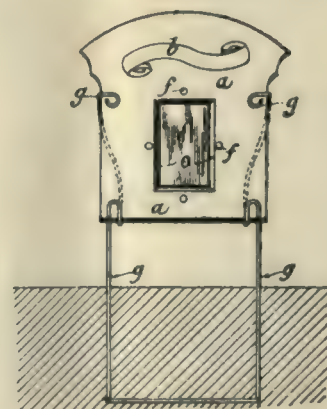


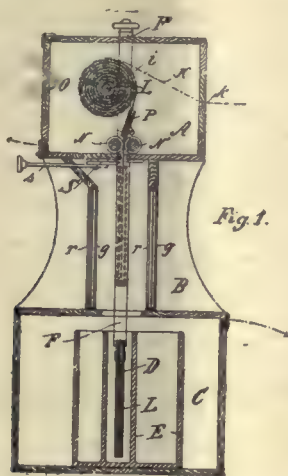
FIG. 4.

"The frame may either be let into a recess formed to receive it in a tombstone or the like, or simply attached on the surface with screws or other fastenings, or it may be used alone as a headstone, or may be carried by an independent support like the wire-holder, *g*, shown in figs. 3 and 4."

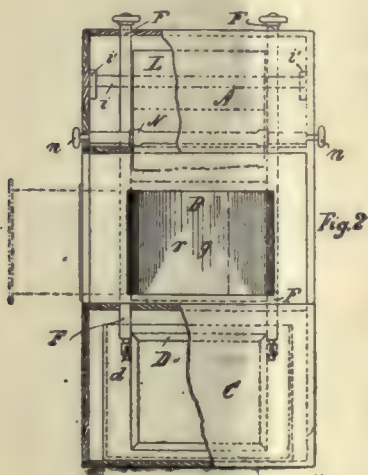


## A DAYLIGHT DEVELOPING APPARATUS.

This is the invention of Herr R. Fleischer. It comprises a casing having three superposed chambers, A B C, whereof the lower chamber, C, contains the developing, fixing, and washing baths, which in the drawings are shown as contained in a vessel, X, divided by two partitions into three compartments, either of which may be brought into position to receive the film. The intermediate chamber, B, is provided with removable coloured windows, g and r, at opposite sides, through which the film may be viewed by transmitted light. A dipping frame, D, is arranged either between rollers, so as to be capable of being moved up and down from the outside by means of draw cords, or, as shown in the drawings, by slide rods, F. The attachment of the frame to the slide



rods, F F, may be effected by a bayonet or other joint, so that, by simply turning the rods, F F, the frame may be disengaged and allowed to drop into the washing bath of vessel, X, and another frame may be attached to the rods for the reception of the next film to be developed. In the upper edge of the dipping frame is an aperture which comes just opposite a slot in the top of the chamber, A, above which is placed the upper chamber, A, for the introduction of the plate or film, as the case may be, into the dipping frame, D. For this purpose it may be a simple bottomless light-excluding casing, into which casing the plate may be inserted by means of an ordinary changing bag and then caused to slide by its



own gravity into the frame, D, when the apparatus is brought to a properly inclined position. In the case of films, as shown in the drawings, the casing, A, is provided with bearings, i', for the spindle, i, of the film spool, L. The end of the black ribbon K, is conducted through slot, k, of the casing to the outside, whilst the film is led through a metallic guide, P, and between the pair of india-rubber feed rollers, N N, of which one has knobs, n, on the ends of its spindle, in order to enable it to be turned so as to cause the film to descend into the dipping frame, D. Directly underneath the top of the chamber, B, and fitted to work over its slot, is a knife, s, which can be operated from outside by means of a handle, s, for cutting off the film as required.

## ACETONE IN THE DEVELOPER.

[Extract from a paper read at the Celeron Convention of the P. A. of A.]

I WRITE these few lines as a prelude or an excuse for the advocacy of a new developing agency introduced about a year ago, namely, Acetone.

It has, in my hands, shown a superiority over that of the carbonate of soda or of potash, it being used in their stead. It is peculiar in its action. A solution of pyro and sulphite will not answer for a developer, a solution of pyro and acetone will not develop, but together, by the reaction of the acetone on the sulphite solution, sets the developer at work. It does not soften the film or cause it to frill, does not stain or fog under any ordinary conditions. I have used it for a year past in my stereoscopic and landscape work, also in lantern-slide work, with great satisfaction, and feel warranted in recommending it highly. In the formulae I give I claim no originality. I give them as I used them. They can be modified by an increase of water, if the brand of plates or subject works to hardness; or, on the other hand, the addition of a small quantity of a ten per cent. solution of bromide of potassium can be used if deemed necessary, in formulae 1 and 3.

The sulphite of sodium I use is a saturated solution. I take, for instance, a pound bottle of sulphite and fill with water, and, on shaking a few times, it soon becomes saturated, then keep the bottle always at least half full of crystals and full of water. I fancy it keeps its purity better in this shape, and certainly it is much more convenient to make up a small quantity of developer.

Four fluid ounces of saturated solution is equal to one of crystals. Never use water hotter than 90° F. in dissolving the sulphite.

## No. 1.—PYRO.

Water .....	2 fluid ounces.
Saturated solution of sulphite.....	2 fluid drachms.
Acetone .....	1 fluid drachm.
Dry pyro .....	5 grains.

## No. 2.—METOL-HYDROQUINONE.

Water .....	8 fluid ounces.
Metol .....	15 grains.

## Dissolve and add—

Saturated solution sulphite .....	4 fluid ounces.
Hydroquinone .....	60 grains.
Ten per cent. bromide of potassium .....	1 fluid ounce.

## B.

Take of A .....	2 fluid ounces.
Acetone .....	1 fluid ounce.

## No. 3.—EIKO-HYDRO.

Water .....	8 fluid ounces.
Saturated solution sulphite.....	4 " "
Eikonogen .....	50 grains.
Hydroquinone .....	25 " "

## B.

Of above .....	2 fluid ounces.
Acetone .....	1 fluid drachm.

No. 1 is especially good for transparencies and stereoscopic work; No. 2, for Yelox or strong negatives; No. 3, for stereoscopic, landscape, and portrait work.

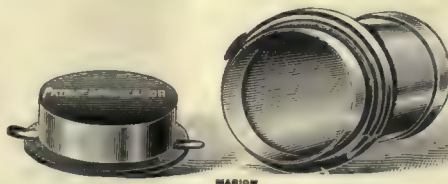
J. BARDWELL.

## Our Editorial Table.

## A STORAGE TUBE FOR PLATINUM PAPER.

Marion & Co., Soho-square, W.

A VERY slight turn enables the lid of this tube to be removed, and, like the receptacle at the bottom which contains the calcic chloride, it is



deeply sunk on the main tube, so that every precaution is taken to keep the platinum paper in a dry condition. The tube is neatly but strongly made and japanned black, and deserves the attention of those who make platinum prints and require to store the paper.



## THE AMERICAN ANNUAL OF PHOTOGRAPHY.

Edited by W. E. WOODBURY. Price 3s. London: Dawbarn & Ward, 6 Farringdon-avenue.

THE scores of pretty pictures that are given in this well-produced annua would alone suffice to make it an excellent gift book for a photographer, but, when to this feature a great number of theoretical and practical articles on current subjects is added, as well as a mass of formulae and tabular matter of every-day use, it will be seen that, besides being a thing of beauty, it is a helpful companion to the photographer. The American annual well sustains its reputation for taste and effectiveness of "get-up."

## A SIMPLE FORM OF STEREOSCOPE.

W. Tylar, High-street, Aston, Birmingham.

MR. TYLAR sends us his list of shilling packets of stereoscopic slides, which he tells us are having an enormous sale. In order to further their popularity, he has prepared a great number of packets, each containing a sample slide, five half-tone stereographs, and a stereoscope. A packet is sent on application for the very small sum of sevenpence. Judging by the sample submitted to us, the stereoscopic slides are most excellent value for the money. But the stereoscope is also wonderfully cheap and effective. It consists of a rectangular card,  $7 \times 3\frac{1}{2}$  inches, holding, at a separation of about  $2\frac{1}{2}$  inches, a pair of single lenses of about an inch in diameter. For viewing the slides sent this simple form of stereoscope answers admirably. We can recommend both it and the slides to those anxious to enjoy the delights of stereography at a small outlay.

MR. F. W. HINDLEY, who is leaving town for Switzerland, is kind enough to send us a few Convention snap-shots, which include portraits of past, present, and future Presidents of the P. C. U. K., and other prominent Conventioners. We shall preserve Mr. Hindley's excellent mementoes of a very pleasant time. Perhaps no photographic institution is so prolific in its outcome of good fellowship and mutual esteem as the Convention. Long may it continue so to be.

## News and Notes.

A CORRESPONDENT in South Africa states that the American biograph people are up at the front taking photographs of the big naval guns shelling Colenso.

WE are pleased to learn that Mr. C. A. Rudowsky, who has recently been seriously ill, has quite recovered, and is now able to attend to business. We congratulate Mr. Rudowsky, and are sure that his many friends will do likewise.

IT is stated that Mr. Coddington, of the Lick Observatory, discovered a new minor planet by means of a photograph taken with the Croker telescope, and afterwards obtained a series of observations during October and November from which he was able to determine an orbit.

MESSRS. FUERTS BROTHERS' animated photographs of war subjects include the following: Siege-train staff (470 officers and men, composed of the 15th Company, Western and Southern Division Royal Garrison Artillery) embarking on ss. *Tantallon Castle*; Departure of 20th battery Horse Artillery with guns for South Africa.

THE Fifth Annual Exhibition of the Borough Polytechnic Photographic Society will be held at the Institute, 103, Borough-road, S.E., on Wednesday, Thursday, Friday, and Saturday, December 27-30, from 7 to 10.30 p.m. Popular lantern entertainments will be given each evening, and admission to the Institute (three-pence) includes the photographic exhibition, concerts, cinematograph displays, and other entertainments organized in connexion with the Borough Polytechnic Christmas *Conversazione*.

THE following are the results of the Austin-Edwards Monthly Competitions:—Lantern-slide Competition: 3l. cash prize, Mr. J. Kearney, jun., Liverpool, *Under the Hillside* and *A Stormy Sunset*; 2l. cash prize, Mr. E. Bellingham, Blackburn, *Canal, Skipton and View through Archway, Bolton Abbey*; 1l. cash prizes, Mr. W. H. Griffiths, Liverpool, *Ruddy Morn*; Mr. H. C. Leat, Bristol, *The Whistler*; Mr. A. Bainbridge, *First Aid*; Dr. J. W. Ellis, *South Door, Le Folgoet, Finistere*; Mr. G. Shreeve, *Pilot Cutter off to Sea*. Film-negative Competition: The Frens camera given each month for the best negative on an Austin-Edwards film has been secured by Mr. William Baldwin, of Foulridge, for his negative *Worm Out*.

THE following are the results of the Warwick Competition for December:—10l. prize, Miss Edith Haslett, 14, College-gardens, Belfast, *Jacko*; 6l. prize, Mr. J. M. Whitehead, George-street, Alva, N.B., *Dreamy Eyes*; 1l. prizes, Mr. W. J. Brooke, 88, Frodingham-road, Scunthorpe, *Our Sandy*; Mr. E. Cardwell, Minster-street, Reading, *Bolton Castle*; Mrs. W. F. Clarke, 11, Park-terrace, Nottingham, *A Butterfly*; Mrs. Albert Durn, Long-street, Wootton-under-Edge, Gloucester, *Little Sunshine*; Mr. A. E. Davies, 24, July-street, C.-on-M., Manchester, *Port Skiffion*; Mrs. E. D. Girdlestone, 90, Greenfield-road, Harborne, Birmingham, *A Merry Sprite*; Mr. W. Gillans, jun., 4, Ninth-row, Ashington, Morpeth, an interior; Mr. P. Goodchild, The Colonnade, Leamington, *A Gipsy Girl*; Mr. T. Humber, Hazel-dean, Teddington, a portrait; Mr. F. Ingham, Winton House, Sale, Cheshire, an interior; Mr. Dan Jones, White House, Llandegla, Mold, *Feeding Time*; Mr. W. Knox, 380, Cumbernauld-road, Glasgow, *White Wings*; Mr. Elfie Levack, 2, Grantley-terrace, Guildford, a portrait; Mr. W. J. Obree-Smith,

14, Sutherland-avenue, London, W., *Nelley Abbey*; Mr. J. Q. Rumball, 6, St. Leonard's-terrace, Reading, *A Meadow Scene*; Mr. Gustave Servaes, Place du Sablon, Ghent, *Sunset in Winter*; Mr. Nicholas Smirnoff, 32, Welbeck-street, Cavendish-square, W., *Rocks at Folkstone*; Mr. C. S. Tyler, High-street, Earls Colne, Essex, *"Me can play Fiddle"*; Mr. H. Whittlesey, 32, Humber-road, Beeston, Nottingham, *Interior, Winchester Cathedral*; Mr. W. J. Wright, Meerbrook, Thurlow Park-road, West Dulwich, a portrait.

## Patent News.

THE following applications for Patents were made between December 4 and December 9, 1899:—

LENSES.—No. 24,089 "Improvements in Objectives for Photographic and like Purposes." P. RUDOLPH.

FILM AND PLATE-CHANGING.—No. 24,201. "Improvements in or relating to Mechanism for Changing Photographic Plates or Films." C. J. BANNISTER.

PRINT-TRIMMERS.—No. 24,278. "An Improvement in Gauges for Print and Card Trimmers." J. CHRISTIE.

SHUTTERS.—No. 24,319. "Improvements in Photographic Shutters and Apparatus for Calculating the required Duration of Exposure." THE THORNTON-PICKARD MANUFACTURING COMPANY, LTD., and C. G. WOODHEAD.

HALF-TONE SCREENS.—No. 24,468. "Improvements in Screen Gears for Photographic Process Cameras." A. W. PENROSE and H. A. BROWN.

STEREOSCOPES.—No. 24,557. "Improvements in Stereoscopes and in Stereoscopic Slides therefor." A. PUMPHREY.

## Meetings of Societies.

## MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
27-30 .....	Borough Polytechnic .....	Fifth Annual Exhibition.
28 .....	Oldham .....	Exhibition of Prize Slides.
29 .....	Bristol and West of England ...	{ Technical Control for Pictorial Results. W. Thomas.
29 .....	Croydon Microscopical .....	{ Composition and Selection of Subjects in Pictorial Photography. A. Horsley Hinton.

## ROYAL PHOTOGRAPHIC SOCIETY.

DECEMBER 19.—Photo-mechanical Meeting,—Mr. Chapman Jones, F.I.C., F.C.S., in the chair.

## A SENSITOMETER FOR THREE-COLOUR WORK.

CAPTAIN W. DE W. ABNEY, C.B., R.E., D.C.L., F.R.S., read a paper with the above title, in which he detailed the results of experiments which were themselves the outcome of much previously published work in the same direction. The sensitometer now described differed in some respects from that which he introduced in a paper read at the Camera Club a few years ago, and would, he thought, be more generally available to photographers. It consisted of a disc with arcs of suitable colours, the bands being so proportioned that when the disc was rotated the luminosity of each coloured arc would be the same; to take a photograph of such a rotating disc it would be necessary to use a screen which would cut off such quantities of light from each sector as would make the densities of each ring the same. If one colour was too dense when a certain screen was used, the experimentalist must remember that its complementary colour must be added, or possibly a mixture of two complementary colours where the rings were each of varying density. The luminosities of the colours of the several sectors, taken in the electric arc light, were given as follows: white, 120; yellow, 70; red, 45; green, 32; blue, 16.8; violet, 12.2; black, 2. Photographs were shown of the rotating parti-coloured disc, taken on Cadett's spectrum plate and with the Cadett screen, the densities of the different colour bands being identical. The application of the method to the production of negatives for three-colour work was very fully dealt with, tables and diagrams being given for the facilitation of the production of the necessary screens; the details are of such a nature that they cannot possibly be condensed into summary form, but they will, in due course, be published in the Society's journal, and will be found to be of great practical value to all who are interested in the subject. With some brands of isochromatic plates Captain Abney had failed to get absolutely uniform densities, and his paper concluded with a consideration as to where the sacrifice should be made in such cases, and which colours were most essential to uniformity. The yellows, reds, and whites should, he said, preserve the same densities as closely as possible, and he regarded yellow and white as the most important; in the red negative he would give the greatest attention to red, yellow, and white; in the green, the white and the yellow; but the green itself might vary twenty per cent. in density without material injury to the print; and, in the blue negative, the blue and white should give identical densities.

MR. JAMES CADETT said there was an idea in some quarters that it was not absolutely necessary to take the true sensation curves as a basis for correct work, and that it was possible to make a satisfactory compromise, and he asked whether sufficient allowance could be made in practice to render this idea workable.



Mr. SANGER SHEPHERD spoke in eulogistic terms of Captain Abney's new method of sensitometry, but said he preferred the older plan of working with pot-metal glasses on account of their permanence.

Mr. J. R. GOTZ asked what pigments were used for making the coloured sectors.

Mr. J. C. WARBURG asked how the colours were laid on, and what precautions were taken to ensure the evenness of the coating.

Mr. W. GAMBLE inquired whether printing inks could be used instead of pigments.

Captain ABNEY, replying to the question as to whether compromises were admissible, said some people wished to take violet as a primary, and that in that case no harm would be done; in triple projection compromise was absolutely necessary. Pot-metal glasses would fade in time, like everything else, but not in the short time in which a pigment would fade. He believed, however, that the pigments which he used were fairly permanent. The glass sensitometer was, no doubt, very useful in the hands of Mr. Shepherd, but the object of the paper was to describe a method which might be more generally useful. It was always possible to get a pure zinc white, an emerald green, a chromium yellow, a French blue, and a vermilion, and these would provide all that was wanted for the sensitometer. The colours could be laid on brutally, with a brush and very little size, and there was no difficulty in getting an even coating. Printing inks could be used, but the glossy surface must be removed or avoided.

#### COMING EVENTS.

January 2, Lantern Evening, "Round about the Matterhorn and the Aletsch Glacier," by Mr. Henry Speyer. January 9, Ordinary Meeting, "Toning with Salts of Copper," by Mr. W. B. Ferguson.

#### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 14.—Mr. Lewis Medland in the chair.

Mr. S. H. FRY showed a sheet of colour printings done on the Orloff press. This system ensures perfect registration, as the whole of the three or four colour impressions are laid upon the paper at once. The illustrations shown were trade labels, and were printed at the rate of 1000 per hour.

Mr. T. E. FRESHWATER passed round a number of prints received from India, showing the terrible destructive power of the cyclone which recently passed over Darjeeling. The railways presented a most woe-begone appearance, and the havoc wrought amongst the dwellings was no less complete.

A piece of glass for use as a focusing screen, prepared by Mr. James Wheeler's reticulation process, was passed round for examination. The glass is very translucent, but opinions differed as to the fineness of the grain. It was observed that an ordinary piece of ground glass could be more easily finely ground than a piece of plain glass. The skin of the glass was already removed, and friction with fine washed emery powder would give to it a very delicate grain. Thin plate glass also was easily worked, there being a very slight skin.

Mr. FRESHWATER gave some interesting notes of a naturalist in the north of London. He brought up a case of about a hundred butterflies, moths, and other specimens collected in his garden and the vicinity during the past summer. By means of the lantern, photographs of many of the insects were shown on the screen. Mr. Freshwater has succeeded in acclimatising to the district more than one variety of butterfly and moth by a system of nursing and feeding. He did not anticipate incurring the ill feelings of his neighbours, as most of them fed on wild growths and did little harm to cultivated plants. He also handed round some specimens of whole insects mounted in balsam by a clever and experienced naturalist, which looked very well on the screen, some being stained for the purpose.

The meeting was also given an opportunity of seeing pictures of the mounds turned up by ants, peculiar and extensive structures, many of which in the Transvaal are used as cover.

The CHAIRMAN added that they burned splendidly, and that, when he was in South Africa, he often cooked his food in a hole scooped out of the mound.

Mr. CHERRY KEARTON's very fine photograph of a spider, web and nest, was shown.

Mr. FRESHWATER said the photographs were taken by Ross's portable five-inch lens, also three-inch, two-inch, and the Zeiss's planar lens of one and three-eighth inch. Some were done with orthochromatic plates, but the majority on the Paget XXX plate.

Richmond Camera Club.—December 11.—Mr. A. C. BALDWIN, on behalf of the Paget Prize Plate Company, gave a demonstration of the capabilities of the Gravura paper, opals, and lantern plates. He exposed and developed prints on the paper and opals, and made three lantern slides while the room was sufficiently well lighted by two gas jets to enable every operation to be easily seen by the whole of the members present. Mr. Baldwin made his exposures by means of burning magnesium ribbon, the lengths required to produce black, brown, and red tones being in the proportion of 1, 6, and 8 respectively. For all tones but black, the developer was diluted and a small quantity of a ten per cent. solution of carbonate of ammonia added, the amount depending on the amount of exposure the paper, &c., has received. Exposures were made for each of the three tones, half an inch of magnesium ribbon being burnt at about thirty inches from the printing frame for black, three inches for brown, and four inches for red. The results in every case were satisfactory, and proved that it was perfectly easy to work in an ordinary room lighted with gas without fear of fogging the prints.

West London Photographic Society.—The second of the series of Begginners' Meetings was held on the 15th. Mr. G. F. BLACKMORE lectured on

#### EXPOSURE AND DEVELOPMENT,

in the course of which he advised the novice to choose a slow plate, and stick to it until he had completely mastered it, using the developer recommended

by the makers, but starting with only half the amount of alkali. He emphasised the necessity of fairly accurate exposures, and strongly commended Wynne's meter as being of great service in that direction.

Liverpool Amateur Photographic Association.—December 16.—Mr. FRED. A. SCHIERWATER gave a lecture on

#### THE VALLEY OF THE WYE.

Mr. J. H. Welch (Vice-President) presided. The lecturer was one of the fourteen members of the Association who at Easter had four days' holiday in the district, and gave the experiences of the party in a very racy, anecdotal fashion, keeping his hearers thoroughly interested from start to finish. By means of a number of slides, Mr. Schierwater took the audience all over the district travelled by the holiday-makers, starting from Monmouth, and visiting Symonds Yat, Ross, Redbrook, Tintern Abbey, Chepstow, Forest of Dean, and Raglan Castle. The slides reflected great credit on the makers, but special praise should be awarded to Mr. F. Anyon for his sheep studies in the Forest of Dean.

#### FORTHCOMING EXHIBITIONS.

1899.

Dec. 22-Jan. 1900 ... Huddersfield (Invitation). W. A. Beevers, Cloth Hall-street, Huddersfield.

„ 27-30 ..... Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.

1900.

January 29-31..... Southsea Amateur Photographic Society. F. J. Mortimer, 10, Ordnance-row, Portsea.

February 10-24 ..... Edinburgh Photographic Society. J. S. McCulloch, 10A, George-street, Edinburgh.

March ..... South London Photographic Society.

April 3-7 ..... Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

#### ORTOL.

To the EDITORS.

GENTLEMEN,—Your Berlin correspondent (Hendrich Sapt) is certainly an industrious man, but he omits to say how many assistants he has to produce his nearly 10,000 plates, films, prints, &c., and he also omits their size. Perhaps they are postage-stamp size, nine on a quarter-plate. May I also assume that his ignorance of the English language, and his peculiar method of expressing himself, is also responsible for the evident misprint or mistake, for he goes on to say, "and all this done with one eight-ounces of developer." As the metric system is in vogue on the Continent, it is evident he means eight litres of developer, or else that he has used eight-ounce bottles of ortol, this being most likely.

About fourteen days ago I purchased a one-ounce bottle of ortol (2s. 6d.). It certainly seems to be a veritable widow's cruise of oil. The used developer really seems to act better than one fresh mixed. Certainly for plates I cannot see any difference, and for bromide prints half new and half old, with a little hydroquinone added, the results are all that bromide paper will give, i.e., clean whites and good blacks, with the usual gradation.

Referring to "C. E. F. N." and "Novice" in your issue of December 8, I regret I did not see what "Novice" describes as your last issue, i.e., December 1, but in an earlier issue I noticed the commencement of an article by Mr. Welford on ortol, and it seemed to me he had reduced it to simplicity itself. The ortol was made up to 60 ounces or parts, the carbonate to 30, the sulphite to 15, and as you were to take 1 ounce of ortol or 1 part, ½ ounce of carbonate or ½ part, ¼ ounce of sulphite or ¼ part, it became evident that the three bottles of solutions all became empty or used up at the same moment, thus a very excellent formula. Regarding bromide a ten per cent. solution was ordered, and five to ten drops of this to each ounce of developer, and if pure whites and blacks are required with bromide paper, ten drops per ounce of developer is not any too much.

Doubtless both your correspondents are aware that parts may mean grains, ounces, pounds, or millimetres, and it is evident Mr. Welford, in speaking of a part, means the amount of ortol one is about to use, and



then half that amount of carbonate, and a quarter that amount of sulphite; at least, that is the meaning I attach to his instructions.—I am, yours, &c.,  
 ARCHER CLARKE.  
 63, St. John's-hill, Clapham Junction, S.W., December 12, 1899.

### THE SOUTHSEA PHOTOGRAPHIC SOCIETY AND THE WAR FUND.

To the Editors.

GENTLEMEN,—I have, no doubt you will be pleased to hear that I have been able to hand over a cheque for 45*l.* to the War Fund for the widows and orphans, as a result of the lecture which was organized by the Southsea Amateur Photographic Society, on "The Real Dickens Land," by Mr. H. Snowden Ward, at the Town Hall, Portsmouth, on Tuesday, December 12. The entire affair was a great success, and the reason I am able to hand over such a substantial sum is because a large amount of the expenses were guaranteed, and paid, by the members of the Society.

I trust other and even more flourishing societies will follow our example, and see what they can do to help so worthy and necessary a cause.—I am, yours, &c.,  
 F. J. MORTIMER, Hon. Sec.

10, Ordnance Row, Portsea, December 16, 1899.

[We congratulate the Southsea Society on their successful endeavour to help a cause that appeals to all hearts, and we hope to see their good example followed by other societies.—EDS.]

### DR. VON ROHR'S THEORY AND HISTORY OF LENSES.

To the Editors.

GENTLEMEN,—In your last number I noticed Mr. W. Curry's protest against my work as far as the late Mr. John Henry Dallmeyer is concerned. I was much interested to hear of a fellow worker of Mr. Dallmeyer's, and I very well understand his wish to record the fact that Mr. J. H. Dallmeyer was a very kind employer. But I am at a loss to understand what this has to do with my criticism as to his being an original thinker in optical matters.

I am, of course, unaware whether Mr. W. Curry understands German or not, but as long as he does not tell me the contrary, I shall think that there is some misunderstanding, due to imperfect translation. One sentence seems to have met with his special discontent (Germ. Edit. p. 218), and, to enable the public to form their own idea on this representation, I give here a translation, as exact as I am able.

"He hardly seems to have been gifted with a specially great originality of invention; in this, and especially in experimenting, he was behind T. Grubb; but, on the other hand, an unmistakable endeavour to retrace the historical development of a type or of a theory distinguishes him from among the opticians of his adopted country."

This comparison between Mr. T. Grubb and Mr. J. H. Dallmeyer could perhaps be considered as being clear enough, but I do not hesitate to declare that in using the term "Optiker" (opticians) I did not mean trading opticians only, but also men who wrote papers on optical matters.

Now, I certainly attribute the greater originality to Mr. T. Grubb, "a man," to use Mr. W. Curry's own words, "whose work still lives, and the influence of whose work will always live." Further, I cannot see any fault in giving this judgment, which I honestly believe to be correct.

Mr. W. Curry's further judgment is given in such general terms that it is impossible for me to enter into details, but there is one line which I think it my duty to answer. It runs thus: "Where he obtained his information from, and his motive, if any, are subjects best known to Dr. von Rohr himself." Now, as to the motive, I intended to write the history of photo-optics, after careful perusal of all printed sources available to me. As regards the sources where I obtained my information from, I gave them in every instance, and I am not aware that my statements are inconsistent with these sources.—I am, yours, &c.,

Jena, December 18, 1899.

DR. VON ROHR.

## Answers to Correspondents.

\* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

### PHOTOGRAPHS AND PAINTING REGISTERED:—

Anty, Ltd., 20, Front-street, Tynemouth.—Photograph of members of Peasey Park football team and committee.

H. Nickson, West street, Fleetwood.—Photograph of park and tennis ground, Fleetwood. Photograph of depa ture of fishing fleet, Fleetwood. Photograph of pleasure boats and lower lighthouse, Fleetwood. Photograph of departure of ss. "Mona's Queen" from Fleetwood to Isle of Man.

M. W. Swiney, Hartington House, Herne Bay.—Painting of Notre Dame du Saints Rosaire.

PAUPER.—Your question is scarcely one of a photographic character. A pharmaceutical chemist or medical man might assist you.

OMILOUSE and C. K. T. do not send us their names and addresses. Hence, according to our rules, their queries remain unanswered.

INVESTIGATOR.—The institution which would answer your purposes the nearest would be the Polytechnic, Regent-street, London, W., where tuition is given privately or in class.

FIXING BATH.—WARDER. Two ounces of hypo to the pint of water, with ten minutes' immersion, is too weak for the paper you are employing. Increase the hypo to four ounces, and the time to a quarter of an hour at least for perfect fixation.

BROKEN PLATES.—J. H. W. It is no use your writing to the makers of the plates. Your remedy is against the one who sold them to you. Probably they were all right when they left the factory. Any how, the one who supplied them to you is the one to whom you must complain.

LIVING VANS.—PHOTOGRAPHER says: "Would you kindly inform me where I could hire a living van from, suitable for a tour? I saw in a paper some time ago the name of a firm in Yorkshire, but unfortunately did not make a note."—In reply: We cannot find a reference to the Yorkshire firm; perhaps some reader will supply the desired information.

TINTYPES.—A. BOWER asks: "What are 'tintypes' and how are they produced, and what apparatus is necessary, and its cost?"—Tintypes are what are more generally known, now, as ferrotypes, and they are produced in the same way, as are also glass positives. The apparatus necessary is only an ordinary camera and lens. The cost will, of course, depend upon size and quality.

INTENSIFICATION.—AJAX says: "I have a valuable negative which has been intensified by Monckhoven's process, but is still rather too thin to give pure whites in the prints. Shall I get increased density if I repeat the intensifying process, and can it be done without risk of damage to the negative?"—Yes, the intensification can be repeated. There need be no risk if the operations are carefully carried out.

FROZEN WATER PIPES.—Mr. T. Everitt Innes writes: "Noticing your recent advice on keeping pipes from freezing, I venture to send the following method (which I don't think is generally known) of thawing outside sink pipes, for those who have been unfortunate enough to neglect your warning. It is simply to place a newspaper or bunch of straw round the pipe and set fire to it. I can guarantee that this is far better than some people's way of putting a red-hot poker up it and melting the lead."

THIN NEGATIVES.—H. CROSS sends a thin negative and says it was a long time developing, and, in the end, had not sufficient density. He asks if it is to undue exposure that the thinness is due?—The negative is fully exposed, but the slowness of development, and its thinness, is probably due to the coldness of the developer and the coldness of the room in which the plate was developed. Keep the solutions up to 60° or 65°, and the dark room at a similar temperature, and all will go well, we have little doubt.

PATENTING AN INVENTION.—PATENT says: "Will you tell me how I can patent an invention? Could I do it without coming to town and without applying to any agent? If so, kindly state how I am to proceed in the matter, especially as I wish merely to protect for about one year. Could I apply to the Patent Office direct to patent it, and would they give me all information free?"—In reply: You need not come to town. The necessary forms can be obtained at the Patent Office, Southampton-buildings, Chancery-lane, London, W.C., and you can obtain nine months' provisional protection for your invention for 1*l.* without employing an agent.

SPOTS ON PRINTS.—SPOTTED PRINT writes: "I enclose a print, which has come up spotted, after it has been finished ten days, some of the others done at the same time have come up the same way. I would be very glad if you could tell me the cause, and how to avoid it in future. I have written the particulars on the back of the print as to toning and washing."—It is impossible to say positively the cause of the spots; but we have little doubt they have their origin in insufficient fixation, for we note that you make the fixing one part of hyposulphite of soda to fifteen parts of water. This is far too weak for the time you give. Use a bath of three times that strength, and we surmise you will not be troubled with the spots.

BLUE PRINTS ON FERRO-PRUSSIAN PAPER.—A. C. says: "1. It is desired to write on these with an ink that will stand the subsequent bleaching; can you state one? Higgins's waterproof ink is not acid or alkali-proof, 2. What will bleach out the blue on above prints and not affect the ink, so that the new matter can be copied in the camera?"—1. Try lithographic chalk, that will probably answer your purpose. 2. Ferro-prussian papers are not all prepared alike, and you do not say how you have prepared that you wish to bleach. In our issue for May 12, and continued weekly, were a series of articles on the iron processes, which gives a collection of all that has been published on them. If you consult them, you will see how to deal with papers according to different formulae.

MINIATURE PHOTOGRAPHS.—VELOX says: "Can you inform me how the miniature photographs are taken, I mean same as taken by Messrs. Seaman? What is the arrangement of camera back or slide whereby a number of different sitters can be taken on the same plate; and also if different sizes could be taken on same plate? Can you also give me any particulars of a special printing frame for this class of work?"—Messrs. Seaman & Sons use their patented printing frame, which they also supply to the public. There are several ways by which a number of portraits can be taken on the same plate—such, for example, having several small lenses on the camera—having a repeating back on the camera, with several repeats; or, more commonly, by a combination of both methods.



# THE BRITISH JOURNAL OF PHOTOGRAPHY.

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## THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1900.

EDITED BY THOMAS BEDDING, F.R.P.S.

What some readers think of the book:—

- "Even better than its predecessors."
- "A remarkable publication."
- "Full of valuable information."
- "Useful and portly."
- "A lot of it—looks all right."
- "Ever welcome."
- "Most interesting and instructive."
- "I cannot understand how, in such a short time, you can complete such a stupendous work."
- "Much to enjoy in the present ALMANAC."
- "I daily enjoy the admirable ALMANAC."
- "I see several new features, whilst retaining the general familiar appearance, which if much altered would give the impression of another book. Good old friends are best kept."
- "The most wonderful publication for a shilling that I have ever seen. You deserve all the praise words can afford for so useful a work."
- "The ALMANAC is the best thing of its kind."
- "A work of monumental capacity."

A few opinions of the Press:—

- "Well up to date. . . . an indispensable adjunct to the outfit of the photographer." *Morning Advertiser.*
- "Welcomed by thousands of photographers, trade and amateur, who have come to regard it as indispensable." *Newcastle Daily Journal.*
- "Welcome both to professional and amateur photographers." *Manchester Guardian.*
- "No photographer ought to be without it." *Shrewsbury Chronicle.*
- "Almost a reference library in itself." *British and Colonial Druggist.*
- "A work of which specialists have long known the value." *Glasgow Weekly Herald.*
- "A useful volume which no photographer should be without." *Kent Argus.*
- "Crammed full of all the very latest information." *Invention.*
- "A massive and remarkably cheap volume." *Birmingham Daily Gazette.*
- "There is nothing like it in the photographic world that we know of, either for bulk, or variety, or merit." *Western Mail.*
- "A very bulky volume at a very moderate price." *Gloucester Journal.*
- "The whole book is thoroughly practical." *Horse and Hound.*
- "Stupendous." *The Stage.*
- "This wonderful almanac." *Pharmaceutical Journal.*
- "An absolute mine of information. . . . ought to find a place in every photographic studio." *Nature.*

## EX CATHEDRA.

By the courtesy of a correspondent, we have received a half-tone photograph of the form of certificate or diploma which the Photographers' Association of America awards to exhibitors at its annual Conventions. The nineteenth gathering of the kind was held this year at Celeron. The design of the certificate is very elaborate. A graceful half-draped figure is holding a crown of laurel over the head of a kneeling young man in tourist's garb. There is, apparently, a bit of Moorish architecture in the background, and surrounding the certificate, which is signed by the President and Secretary, there are the seal, a camera, printing frames, pestle and mortar, dishes, graduates, and so forth, while at the right-hand side of the picture some winged, cherub-looking young persons are floating about amidst a shower of mounted prints, &c. Like Todger's, the P. A. of A. can do it. We wonder if the British Convention will ever rise to such great heights?



WE have had submitted to us the reproduction of a print made from a negative taken in the "Al Vista" panoramic camera which is manufactured by the Multiscope and Film Company, of Burlington, Wis., U.S.A. It is a view of Niagara Falls, showing both falls, from Old Clifton House to the railing of the Suspension Bridge. The size of the picture is twelve inches by four inches, and, as may be imagined, a very wide angle of view is subtended. We understand that during the coming season cheap rollable film cameras for panoramic photography will be placed on the British market, and no doubt they will attract considerable attention.

\* \* \*

MR. T. C. PHYTHIAN, of Newlands, Cheetham Hill, Manchester, writes: "I have observed your article in the ALMANAC on stereoscopic photography, and am aware that you are specially interested in the subject. As you may not have seen a similar slide to those I have been producing for some time past, I take the liberty of sending a few for your inspection, thinking they may be of interest." We thank Mr. Phythian for his courtesy. The style of binocular slide which he sends us is not novel to us; we possess several mounted in a similar way, produced by the late W. Harding Warner. However, to describe the slides in question: Mr. Phythian's binocular views measure, each half,  $2\frac{3}{4} \times 3\frac{3}{4}$ , and they are attached to mounts  $6\frac{3}{4} \times 4\frac{1}{2}$ , behind green card "mats," or cut-out openings. This is a very effective way of mounting stereo slides. Mr. Phythian also possesses a stereoscope, working like a camera, into which thirty or forty slides are put at once, and racked forward, the front one dropping through a slot, and so on, and he describes this as a very pleasant way of looking at the pictures.

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SOME attention is being excited by a process for reproducing paintings, which is said to be in use just now in the German picture galleries. We are told that "it differs in its method from any heretofore employed, as it enables the reproducing artists not only to create true facsimiles of originals by means of photography and steel etching, but also to produce the depth of colour and peculiarities of manner of each master. The process, while an intricate and costly one, is not patented, but the details are kept a strict secret. After the original paintings have been photographed with the aid of special cameras and plates, the photographs are transferred to steel plates, the surface of which, by some peculiar treatment, has been prepared to receive the impressions from the negative. The outline is thus obtained upon the steel with great exactitude. The colours, as true to the original painting in the distribution of light and shade as manipulation of the brushes of eminent artists can make them, have been reproduced on the photographic copy first obtained, and the complex colour picture thus created is transferred to as many lithographic stones as there are colours represented in the picture, from which impressions are taken on presses worked by hand. The greatest care is used in the choice of subjects for reproduction." On these very meagre details it is impossible to offer an opinion or criticism of this wonderful process; but it appears to have a resemblance in some respects to a method of reproduction introduced some time ago by Mr. Henkner, though that gentleman, if we remember aright, was content with monochrome. The above process reads like a mixture of intaglio etching and chromo-lithography.

ACCORDING to Dr. Gustave Michaud, in the *Scientific American*, a Boston firm sells, under the name, "X-ray camera," an apparatus which apparently enables an object to be seen through any opaque substance. But the X rays have nothing whatever to do with the phenomenon, which is really produced by a set of four hidden mirrors that conduct the light around the opaque object. The Doctor recently devised and constructed a little apparatus, which, he says, is just as deceitful as the X ray camera, but which is more readily made, and gives results by far more astonishing for spectators who have not been told the secret of its construction. It apparently reproduces instantaneously and neatly the interior of the human body, giving to every organ its natural colour. The whole operation is performed under the eyes of the bewildered sitter, who watches the X-rays in what seems to be the act of drawing and painting before his eyes his vital organs. Dr. Michaud adds that the apparatus looks like the objective tube of a camera, with the plate on which the image is to be produced in full sight of every one. The apparatus is placed opposite the person whose viscera are to be photographed, and, to heighten the effect, a lamp may be solemnly placed behind the sitter. The operator invites every one to look at the white sheet of paper, and presses the rubber bulb of the shutter. A coloured image appears instantaneously on the paper. The lungs are of a bright red colour, the heart is darker, the veins are blue, the stomach and intestines are of a greenish tint, other parts of the body paint themselves in black on the white paper. This sudden apparition generally startles the sitter, but a few remarks on the healthy looks of his lungs will place him at his ease. The photograph is taken out of the apparatus and passed round among the spectators.

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THESE interesting results are brought about in the following simple manner: Before the experiment the sheet of paper is treated as follows; it is pinned over any anatomical drawing, showing the position of the principal thoracic and abdominal organs. If the sheet of paper is not too thick, the drawing can be seen through it. The space occupied by the lungs is then painted with a diluted solution of sulphocyanide of potassium. A more concentrated solution of the same salt is used to fill the space outlined by the heart and principal arteries. A few big veins are painted with a solution of ferrocyanide of potassium. A more diluted solution of the same salt is used for the stomach and a few intestinal folds. The rest of the body is uniformly painted with a concentrated solution of tannin. When the paper is dry, the drawing is absolutely invisible, for all the above-named solutions are colourless. The sheet of paper is now ready for use in the apparatus. The objective tube does not contain any lens, but merely a small atomiser filled with a solution of ferric chloride. When pressed, the rubber bulb sends air, not, as every spectator believes, into a pneumatic shutter, but into the atomiser. As a result, a fine and invisible spray of the perchloride of iron solution reaches for a moment the sheet of paper. Dr. Michaud points out that the reactions between ferric salts on one side, sulphocyanide of potassium, ferrocyanide of potassium, and tannin on the other side, are among the most sensitive of analytical tests, owing to the extraordinary intensity of the red, blue, and black colours which originate in these reactions. Hence the instantaneous production of the coloured picture.



## A SEASONABLE BUSINESS HINT.

PROFESSIONAL photographers—we are more especially alluding to portraitists—are not having a busy time of it just now; nor is there any great prospect of a material improvement for the next two or three months. But could not many photographers do more business during the winter months by making a greater feature of winter portraits, that is, pictures taken with wintry surroundings? In some countries—Canada, the States, and in Russia—the winter is turned to very profitable account by portrait photographers taking pictures of sitters clad in their furs, with accessories covered with snow, and a background to correspond. In the countries named they are sure of a winter, and they prepare for it. Here we are not sure of one, and few sitters would care to be taken with snowy surroundings if we experienced no real winter; yet there is no reason why artists here should not be prepared to profitably avail themselves of it should a hard one set in.

Some have had the idea in mind, for last week we had to reply in the Correspondence column to a firm in the country as to whether we should recommend them to make a feature of winter portraits, &c. We should say that all photographers would do well to at least make preparations on the chance of profiting by a severe winter, even though we have none, because it can be done with little or no outlay, and with but little trouble. Already flocks of gulls are to be seen at London, Blackfriars, and Westminster Bridges, and this is considered by many of the "weatherwise" to portend a hard and prolonged winter.

As we have just intimated, to be prepared beforehand involves very little cost and trouble; it may therefore be well to give a few hints on the subject. First, we must have a suitable background, and any old outdoor one may easily be made to answer the purpose, even if worn out for other work. Supposing it is a sunny landscape, for example, we take a white crayon, or piece of chalk, and trace over the *upper* surface only of the branches of the trees, rocks, prominences, or anything else where snow would have lodged had the scene been real. In this way an effective background is easily provided, but it may be mentioned that the crayon work should not be too pronounced, or it will become obtrusive in the picture. With regard to accessories, rustic stiles, steps, balustrades, and the like should have some cotton-wool or wadding, such as is sold by the drapers in sheets, tacked on their upper surfaces to represent fallen snow, which it will do very effectively. A few sheets of white wadding, stitched on to a sheet or piece of canvas, will complete the arrangement so far as the ground is concerned. It will now be seen that the whole thing involves very little trouble and less expense, as the chalk can be readily wiped off the background, leaving it as at first.

The next thing is the specimens. It goes without saying that they should be appropriately attired. A sitter in summer attire, or in evening dress, with outdoor winter surroundings, would, of course, be highly incongruous, but we have frequently seen equal incongruities, and from good houses, in which sitters, clad in furs and heavy costumes, have been posed before brightly lighted sunny backgrounds and surroundings, which were obviously only appropriate to summer costumes. Furs and fur-trimmed costumes lend considerable scope to the photographer, as they tell well in the pictures, and should be freely utilised in specimens of winter portraits.

The introduction of a pair of skates will also add to the effect of the winter portrait.

In many of the Canadian, American, and Russian pictures we have seen, the appearance of falling snow has been depicted, i.e., flakes of snow falling thickly on and around the sitter. This, it need not be said, is done by "faking" the negative; but it is easily done by splashing on or distributing over the finished negative an opaque pigment. One of the best methods, perhaps, is to take Chinese white, as sold in tubes by the artists' colourmen, and thin it with water on a palette, then take an ordinary toothbrush and touch the ends of the bristles on the palette so as to just take up a little of the pigment, and then, in front of the negative, pass, say, the back of a knife across the bristles so as to flick the colour on to the negative in fine particles. Before doing this it is desirable to varnish the negative, as then, if the result is not satisfactory, the pigment can be cleaned off and a fresh essay made; whereas, if it were not varnished, that could not be effectually done.

In some of the pictures of this kind we have seen, the snow has been depicted as falling every where except before the face of the subject, which gives the picture a highly incongruous appearance. Yet, of course, the portrait is the main feature to be considered in the picture. This incongruity may, however, be avoided, and yet the unobstructed portrait retained, in the following way: Let the sitter hold a small umbrella over the head, though not too forward so as to obstruct the light. In this way the face will not be represented free from the snow flakes and at the same time be free from incongruity. The umbrella, which may be a stock one, should be *thinly* covered with the white wadding, stitched on, so as to be in unison generally with the picture.

With the above hints any one with ordinary ingenuity can quickly extemporise every requisite for producing portraits that prove so remunerative in those countries where there is a certainty of having a real winter, such as we experience at times, though uncertain ones.

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**The City and Art.**—The Corporation of the City is doing its best to encourage art. At its last meeting the Court of Common Council granted the use of the Art Gallery for a time for the display and sale of works of art by Royal Academicians and others in aid of the Mansion House Transvaal War Funds. It was also referred to the Library Committee to arrange for an Exhibition in the Art Gallery in 1901 of the works of Velasquez and Fortuny. The Court also resolved to co-operate with the London County Council in the endeavour to secure the preservation, on account of its historic associations, of the house, No. 17, Fleet-street, and to contribute 2500*l.* towards the purchase of the freehold, provided that the decorated room on the first floor be preserved for the public benefit. It remains to be seen whether the vandalistic London County Council will agree with this. If this old historic room is destroyed, it will certainly not be the fault of the City Corporation; it has more consideration for art and antiquity than has the L.C.C.

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**Does Backing a Plate render a Longer Exposure Necessary?**—An interesting point was raised the other night as to whether backing the plate slowed it. The discussion arose through a remark made by Mr. Thomas Fall at a previous meeting to the effect that it did. This is not the first time that the subject has been mooted, and different opinions on it expressed, without out any definite conclusion being arrived at. A series of carefully conducted comparative experiments to settle the question would be valuable. Of course, the results, to be conclusive, should be gauged by some such method as that of Hurter & Driffield. Who will undertake the work?



**Permanent Albumen Prints.**—A fortnight back we quoted from an American contemporary an article with the above heading by Mr. D. Bachrach, which we commend to our readers. The name of Bachrach is known here as well as in the States as being one of the oldest amongst practical photographers, and anything appearing over it may be relied upon. On many occasions, when writing on the permanence of the old silver prints, we have pointed out that much of their permanence is due to the fact that very strong baths were used, and that the image was not only on the surface of the paper, but in its body; also that the old prints were more thoroughly fixed than is the case with the majority of the modern ones. In Mr. Bachrach's method the albumen paper is not merely floated on a sixty-grain bath, but is immersed in it for the time usually given in floating. It is then printed from the back, and the result is, practically, a plain paper print. As Mr. Bachrach says, "the print is really all through the body of the paper." Another point in Mr. Bachrach's method is the fixing of the prints. He uses the fixing solution about double the strength of that usually employed in this country, and allows "fully twenty minutes' immersion therein." Prints carefully produced under these conditions, and printed from strong negatives, we have no hesitation in saying, will prove as permanent as those old ones that have stood the test of time for thirty years and more.

**X Rays in Court.**—Before now, photographs taken by the X rays have been produced as evidence in a law court in this country. Recently they were shown, as a witness, in a case in Paris when Maitre Labori, the celebrated counsel for Captain Dreyfus, prosecuted his action against the *Libre Parole* newspaper for defamation in publishing reports pretending that the outrage was a sham, and that Maitre Labori had not been wounded by a revolver at all. According to the reports of the case in the *Débats* and the *Temps*, the operator who took radiographs of the bullet imbedded in the muscles of the back produced them in evidence. There is no question that these photographs had great weight with the Court, for the *Libre Parole* was condemned to a fine of 2000 francs, and the verdict ordered to be advertised, at the expense of the *Parole*, in forty Parisian journals and 200 provincial ones, the cost of each insertion, however, to be limited to 100 francs each. In face of the radiographs showing the bullets imbedded in the muscles of the back, it would seem useless to attempt to prove that the man was not shot at all, so the paper allowed the case to go by default.

**Another Meteorological Observatory.**—We read that a meteorological observatory is to be established at the summit of the great cathedral spire, Ulm, Germany. This spire reaches an elevation of 528 feet. Although the spire was only completed in 1890, the church itself was commenced some 500 years ago. There is certainly some novelty in the establishment of an observatory on the spire of a cathedral, and it almost leads one to speculate as to whether one on the top of St. Paul's would aid our Meteorological Office in making more accurate daily forecasts issued by it of the weather to be expected in London from day to day than it does at present. If our daily forecasts were more accurate and reliable, they would often be of great value to photographers.

**Gas Cylinders.**—The lantern season is now in full swing, and we see that the District Railway are repeating the same notices they issued last year to the effect that cylinders of compressed gases will not be accepted as passengers' luggage, or otherwise, nor will they be "admitted for any purpose on the Company's premises." The North London Railway have also reposted their notices that the cylinders will not be conveyed as passengers' luggage. They, however, will carry them under certain conditions, "which may be obtained at the time of booking." What they may be we are not aware, as we have not had occasion to book any by that line, and, from the wording of the notices, the conditions, it would seem, are not to be had at any other time. Would it not be better if this Company had stated on their notices what the conditions are, so that

would-be senders could know and comply with them before they tender them at the booking offices? However, we have an idea that both these Companies do convey cylinders of compressed gases, but then they generally travel in handbags or the like with the passenger.

**Photographing Gulls on the Wing.**—Photographers resident in London need not make a pilgrimage to the seaside to obtain photographs of seagulls while they are on the wing. Just now they have only to pay a visit to, say, London, Westminster, or the intervening bridges, and they will find flocks of them hovering about on their annual visit to the metropolis. Unfortunately the light is not favourable at this time of the year for rapid exposures, but there is no reason why some successful pictures should not be obtained on a fine day. Gulls are not so difficult to photograph as some may surmise, for, though swift of flight, there are times when, while in mid air, they remain almost stationary, and that is the time to wait for. With a lens with wide aperture, rapid plates, and not too quick a shutter, some tolerably good pictures of the birds may be secured. Very good photographs have been obtained of gulls on the Thames.

#### THE PHOTOGRAPHIC DEPARTMENT OF THE VIENNA POLICE.

[Translated from the *Photographische Correspondenz*.]

A new department has recently been organized in connexion with the Vienna Police Service, to which the name of "Identification Office" (*Erkennungs Amt*) has been given. It is allotted two duties: The measurement of individuals, or anthropometry, and photographic portraiture as an aid to identification.

The Identification Office is located at the prison in the Theobaldgasse, Section VI. of the city.

The anthropometrical department consists of a class room where special lectures are given in the art of measurement, and adjoining it is a large hall where malefactors are measured. The hall is likewise used for the storage of the measurement charts and the photographs.

The hall has been arranged similarly to that of the Paris establishment, which is under the direction of M. Alphonse Bertillon, whose father organized the system of judicial photography. The measuring instruments were exhibited to the public at the Jubilee Exhibition held the previous year.

The photographic department comprises a studio, furnished with two sets of apparatus, where the photographs are taken in two positions—profile and full-face. Next the studio is the dark room, adjoining which are the enlarging and other subsidiary rooms. Printing is done out of doors.

The first department undertakes the measurement of individuals and their description, for purposes of identification.

The second department is devoted to portraiture and record photography and to other auxiliary legal purposes.

Nothing of great practical importance can yet be recorded concerning the new department, as it has only just commenced operations, and further development seems desirable, but a few points will illustrate the manner in which the department may become of service to those who have charge of the public safety.

If an inquiry has to be made, certain facts must be recorded in all cases. Be it theft, robbery, murder, arson, or any other offence, the photographer is called upon to take certain photographs, and it is his duty to make the best use of his knowledge in assisting the official by the photographs he takes.

On November 1, 1899, the head of the Imperial Police also opened a Police Museum, where all instruments of crime and photographs of facts relating thereto are sent.

The following practical examples will show how the service is carried on:—

A parcel of American bank notes was handed in at an American post office, and contained a sum of \$75,000. When it arrived at its destination, the recipient noticed that \$30,000 had been abstracted. The officials who had charge of the case could not discover any clue to help them in their inquiries, and the thief would not have been discovered but for the intervention of an expert official of the Identification Office. This official, upon examining the parcel, found that three seals upon one of



the wrappers had been broken, and that one of these had been made good by pressure with the thumb. As he was acquainted with the methods of identification, he decided to follow this clue. He obtained through the head of each department a wax impression of the right thumb of each person through whose hands the pilfered parcel had passed. By his desire the names were withheld. The impressions were merely numbered, and the corresponding names were only known to the authorities. The wax impressions numbered seven. They were handed to the photographer with instructions to make enlargements from them of a certain definite size. The impression of the thumb upon the seal was also enlarged to the same standard.

The enlarged photographs were then compared, and five were at once rejected as having no resemblance whatever to the impression upon the seal. The sixth showed a slight similarity, but the seventh corresponded with mathematical exactness, and this justified the supposition that the packet had been resealed by the owner of that particular thumb.

In cases of footprints in dust or sand, these should be photographed before any measurements or impressions are made.

Another task of the Identification Office is to determine whether hair, such as may be found, for instance, in the hands of murdered persons, is that of a male or female. In order to demonstrate this by photography, a microscopic examination should be of the greatest value. Also for demonstrating the difference between the hair of men and animals, and for its graphic representation, it should be desirable to photograph the hair of men, dogs, horses, cats, oxen, goats, &c., and make suitable, characteristic enlargements for comparison in case of need.]

A very important item for comparison is blood. A prisoner declared that the blood on an axe which he had used was that of a slaughtered goat. The comparative photographs, made with the aid of the microscope, showed clearly that such was not the case, as the corpuscles of human blood, under the same magnification, appear to be much larger than that of the goat. By means of the microscope, objects may be measured within  $\frac{1}{1000}$  mm. A still more interesting fact is the possibility of determining by means of photography whether an unfortunate person has lost his life by fire or by an antecedent crime.

Apart from the apparatus, a certain routine must be observed in making these photo-micrographs. It is much easier to demonstrate a forgery. For, example, an account had been falsified by changing £. 300 to £. 560. Photographs from the front and back, and by artificial lighting, enlarged to 100 diameters, demonstrated the falsification, as the negative was more dense where the erasure had been made, owing to the transmission of more light. The figures also were uneven in appearance, being more intense where the pen had passed twice, and lighter where the ink had only been used once.

In the department of Public Safety numberless instances could be cited where technical knowledge and a high degree of personal acuteness and cold-blooded impartiality are displayed. It is still fresh in our memories what a deplorable part M. Alphonse Bertillon, the head of the Anthropometrical Service of the Paris Prefecture of Police, played in the Dreyfus case, to the astonishment of all, by declaring that the incriminating bordereau was in the handwriting of Captain Dreyfus, whereas it was afterwards shown that Esterhazy had manufactured it. Bertillon evolved a most complicated system, by which he sought to show the Court how he could form a conclusion concerning the character of Captain Dreyfus's writing from that of Matthieu Dreyfus, the accused's brother. None of the daily papers attempted to follow his deductions, and experts could only venture suppositions. He seems, however, to have studied Francis Galton's method. Galton photographed ten members of the same family—father, mother, child, &c.—and, by superposition of these under-exposed images, obtained an unsharp picture, which he declared was the family type. Perhaps M. Alphonse Bertillon obtained certain common expressions from letters of various members of the Dreyfus family, and photographed them one over the other, and thought he could thus establish the characteristic writing of the Dreyfus family. Principally on the ground of his opinion Captain Dreyfus obtained a free passage to the Devil's Island, such was the respect in which the dictum of the chief of the anthropometrical service was held.

It will be understood from this how important and responsible are the duties confided to an institution which has to interpret graphically the ordinary descriptive conclusions of medical jurisprudence. But it will also be acknowledged how conclusive a photograph must be to a Judge who has not seen the circumstances of a crime, when it registers the first, undisturbed impression of a deed *sine ira et studio*, and without possibility of prejudice or error on the part of experts.

FRANZ RITTER VON REISINGER.

#### SOME NEW EXPERIMENTS WITH LIPPMANN'S PROCESS.

DR. R. NEUBAUSS reports, in the current number of the *Photographische Rundschau*, on the experiments which he has made this summer on the above subject, and excuses himself for the reason that there are many questions raised which are not only of special interest for this process but also of general interest, and he points out that, if a Lippmann photograph be left for any time in the fixing bath, it completely disappears, as the silver is dissolved by the hypo, whilst it is well known that an ordinary negative may be left for a whole day without ill results; further, it is absolutely necessary to develop a Lippmann photograph at once, or the image will be considerably worse. Further, he asks the pertinent question, Why is it, if one of these photographs be soaked in water before development, the latent image is weakened?

Also, by sensitising the finest-grained plates with dyes, different experiences are met with, for the plates sensitised by bathing in solutions of dyes differ considerably as regards colour sensitiveness from those for which the emulsion was coloured, and it is unfortunate that all orthochromatising experiments are carried out by baths.

His recent experiments have been in the direction of utilising albumen plates for the reproduction of compound colours. He had already pointed out that careful reduction of the finished pictures with very dilute hypo and ferridcyanide reducer was an advantage, but that the process was very uncertain.

Assuming that the superficial gold glaze which appeared on these albumen results was due to contact with the mercury, he attempted to avoid this by protecting the film, and for this purpose the sensitised plate was coated with pure albumen and then strongly whirled. The results were, however, absolutely negative, as was also the case with a two to three per cent. solution of gelatine was used, though then Newton's rings were seen, the colour of which was dependent on the thickness of the gelatine coating.

Harking back to some of his earlier experiments with a mixture of albumen and gelatine, he tried the saturation of the prepared albumen plate with gelatine. The sensitised albumen plate, after treating with the dye, was laid for ten minutes in a two per cent. solution of gelatine, heated to 50° C. and then vigorously whirled; but even the thin gelatine skin then left on the plate was found to be prejudicial, so the plate was rinsed with hot water and then whirled. The result was striking; a plate thus treated and exposed in the spectrograph showed that, as regards the brilliancy of the colour, it had the character of a gelatine plate, and that with compound colours they were correctly reproduced just as though a gelatine plate had been used.

Whilst the plate is left in the hot gelatine solution it should be brushed with a soft brush in order to remove air bubbles.

The plates treated in this way showed a somewhat lower sensitiveness to red, and this was obviously caused by some of the cyanine in the albumen film being destroyed by the gelatine. In order to avoid this, enough alcoholic cyanine solution (1:500) should be added to the gelatine solution to give it a light blue colour.

In order to decide whether it was only the hot bath or whether the gelatine was essential, the plate was treated with hot water only, with the result that the colours were as bad as with the albumen plate not treated, thus proving the necessity of the gelatine. It was noted here that an albumen plate when sensitised could be left for ten minutes in boiling water without causing the albumen to coagulate or it to lose its developable qualities. A plain albumen plate thus treated was coagulated immediately.

Further experiments enabled a much simpler process to be discovered, whereby the four processes were reduced to two. Thus, after the plate had been sensitised in the silver bath and washed for fifteen minutes, it should be placed for five minutes in the following solution, heated to 50° C. :—

Gelatine solution (2 per cent.) .....	400 c. c.
Cyanine solution (1:500) .....	10 "
Erythrosine solution (1:500) .....	10 "

Then rinse with hot water and dry. The dyes will keep for a long time in the hot gelatine solution without precipitating.

Arising from past experiences, some experiments were made to try and trace the cause of the superficial golden glaze on albumen plates when taking compound colours. Compound colours can also produce this golden glaze on gelatine emulsion plates if the plate is over-sensitised for yellow and green, which frequently happens when sensitising with erythrosine for yellow and yellowish-green, and they have not the necessary sensitiveness for blue-green. With albumen plates the over-



sensitising for colours can be demonstrated most excellently. If the silver albumen plate is bathed only in a cyanine bath, the whole of the surface with compound colours appears covered with a reddish metallic glaze, and the red which is contained in all the compound colours alone appears. Exactly the same occurs with respect to yellowish-green when only sensitised with erythrosine.

We possess now, however, as will be seen later when we come to speak of gelatine plates, an excellent sensitiser for blue and green. If a gelatine plate is sensitised with cyanine, erythrosine, and glycin red, absolutely closed bands are obtained in the spectrum, and the metallic glaze is avoided, which is the proof of the over-sensitising with erythrosine. Experiments proved that glycin red was not so useful for albumen plates as to warrant its use.

Professor Wiener has shown (Wiedemann's *Annalen*, 1899, p. 488), both by calculation and experimentally, that the surface reflection in Lippmann's photographs considerably alters the colours, and that it is necessary to get rid of this by cementing on a cover glass.

Dr. Neuhaus found that some kinds of albumen clear very much quicker than others, some taking a few days and others several months. Cleared albumen, which had been kept two and a half years, was absolutely unchanged. When cleared albumen is exposed for a long time to sunlight, it darkens considerably, but this darkened albumen presents no advantage for this work. As several kinds of albumen show a great tendency to blister and slip off the glass, trial was made to make the albumen adhere better by treating it with formalin. With a one per cent. solution the albumen dissolved instantly, with a five per cent. solution it began to dissolve at the edges, with undiluted formalin the film became soft but did not dissolve, but, when sensitised after, this plate was absolutely insensitive to light.

If an albumen plate be laid in the agfa intensifier, it behaves rather curiously; in a few minutes the silver deposit becomes denser, and in some cases the colours are better. By continued action the plate bleaches and a white-surface fog forms and the colours disappear, but by treatment with amidol the fog disappears, the colours reappear, but are defective. When soaked for twelve hours in this intensifier, the plate is completely bleached, and by subsequent treatment with amidol a silver glaze appears as though the whole of the surface were silvered, but every trace of colour disappears.

(To be continued.)

#### FOREIGN NEWS AND NOTES.

**Coppering a Negative.**—The following process, which is described by Graf Vittorio Turati, of Milan, in Liesegang's *Photographisches Almanach*, might be useful for the preparation of small ornaments by means of photography. The negative or positive should be prepared by means of the wet-collodion process, and fixed and washed as usual, only preferably on plate glass. The negative should be placed in a clean dish, and covered with the ordinary cupric bromide intensifying solution, and then blackened with silver nitrate, and this should be repeated two or three times, and after washing the negative may be dried by heat or spontaneously. It should now be placed in an accurately levelled dish, and covered to the depth of about one millimetre with a saturated solution of cupric sulphate, and allowed to remain for about five minutes. Then should be added about half the quantity of fresh cupric sulphate solution which has been acidulated with sulphuric acid, and the dish well rocked. Fine iron filings should now be carefully and evenly sifted over the whole of the negative, when the negative image will be seen to gradually cover itself with a fine deposit of red copper, and it is then only necessary to rinse it under a tap and allow it to dry.

**Increasing Lamp Light.**—M. G. de la Furetière states that the addition of one part of amyl acetate to every four parts of paraffine not only considerably augments the brilliancy of the ordinary oil lantern for projection, but prevents the disagreeable smell of the paraffine. Whilst this may be true, it is as well to point out that the Hefner-Alteneck amyl-acetate normal lamp has to have the whole of its working parts made of solid silver, otherwise the acetate attacks them if made of brass, and it is therefore probable it might attack the body of the oil receptacle, its screws and burners.

**Diffraction of X Rays.**—Dr. C. H. Wind and Professor Haga have succeeded in producing diffraction fringes with X rays, and from measurements the wave-lengths run from 0.0000002 to

0.0000001 mm., and their conclusions are that the X rays are of the same nature as light waves, that they have a wave-length from 2500 to 50,000 times smaller than the middle of the spectrum green.

**Some New X Rays.**—A contributor to the *Revue Suisse de Photographie* affirms that he has been able to prove the existence of natural X rays, and he thus describes how he did it: In a courtyard of a house partly illuminated by sunlight he placed a sitter, so that he was just on the limit of the sunshine, and so that only his back was illuminated by the sun. On making an instantaneous exposure, the operator working in the shade and subsequently developing the plate, the sitter's head was found to be transparent, and a door six yards behind it was distinctly seen through it. The bones of the legs were distinctly seen also. The same results were obtained when working in a room lit in the same way. The editors of the said journal append as a footnote, "Cette publication est faite sous toutes réserves," and we are not surprised either.

**The Melano-chroscope.**—Under this somewhat clumsy and long-winded name, the firm of Lesueur are placing upon the market an instrument devised by Louis Ducos du Hauron for obtaining and viewing three-colour transparencies, and it is stated to be rather smaller than a 9×12 cm. hand camera, and to consist of six parts besides the camera or box as follows: A board containing three apertures, which limit the amount of subject included; a frame carrying three coloured screens, which is used not only for taking the three negatives on one plate, but also for viewing the transparencies; a dark slide and a frame, which has three grooves in it—the first is for the ground glass for focussing on and for the reception of the dark slide, and the other two grooves are for placing grey glasses in, in order to equalise the illumination of the transparencies; for taking the negative, a mirror is inserted in the camera, which gives the three images, and a perforated yellow screen or stop is used, and supplementary lenses are used for taking near objects. An eyepiece is also provided. Its use is said to be extremely simple and the results superb.

#### THE MAKING OF PHOTOGRAPHY.

[An Address delivered in Convention Hall, National Export Exposition, Monday, October 2, on the Occasion of the Celebration of the Seventy-fifth Anniversary of the Franklin Institute, Philadelphia.]

STANDING at the close of three-quarters of a century, marked by intense scientific activity attended by amazing progress along all lines, the most superficial consideration of photography and its applications exhibits it as one of the most important factors in the life of to-day evolved from that activity. Using the term in its most comprehensive conventional sense, it touches at numberless points all sciences, all professions, all trades and industries. It would be a hopeless task to compress into the limited time, very properly assigned to this the most recent branch of this section on this occasion, the most imperfect statement of the achievements of photography, to say nothing of indulgence in speculations as to its further possibilities. But the occasion does not seem to require it. It belongs to the Franklin Institute, and at this, its seventy-fifth anniversary, it seems appropriate to consider photography and its history in its relations to the Institute, for photography and the Franklin Institute were young together. They have grown up together. It has had a share in the making of modern photography. When the Franklin Institute was founded, the word photography had not been coined, or at least had not struck the ear of the lexicographer. It may have been one of many words used according to the fancy of the individual investigator to connect the accumulating facts of an inchoate branch of science, but it was not the first, and, when it did put in an appearance, it was not free from adverse criticism. There was a time when heliography may have been preferable, but with the extended industrial use of the electric light, magnesium light, and even gas light, to say nothing of the Röntgen rays, it would be much more of a misnomer to-day than photography, which word must be regarded as holding its place to-day as the survival of the fittest. It is an interesting coincidence, too, that the year that witnessed the founding of the Franklin Institute is perhaps the most important in the history of photography. It was not, it is true, the year in which any important discovery was made or announced. It was simply the initial year of those experiments that culminated in the discovery that constitutes the birth of modern photography. It was in that year that Daguerre first turned his attention to photographic investigations. For, after all has been allowed that is to be credited to, or even claimed for, others, he still remains the central figure in photographic history. Photographic events date backward and forward from him. Without his discovery, all photographic that preceded him would have been embalmed in the history of science, overlooked, and perhaps entirely lost, until revived by the touch of some such



great discovery as his. His success at once caused all records to be ransacked to be assured that he had indeed made so unique and marvellous a discovery. As usual in such cases, some things were found that at first sight seemed to reduce his claims, but which, when fully considered, do not affect them in the least. In 1824, then, he entered upon the fourteen years of solitary, discouraging, almost hopeless, but unintermitted experiments that finally resulted in the discovery to which his name has adhered. Accustomed as we have become to the almost daily announcement of similar great unexpected and unheralded discoveries, we can hardly realise the sensation it created, nor the struggle between the great desire to believe it true and the incredulity of that day, so much greater than that of our own. This was even heightened about time that by the then recent "Moon hoax," to which the announcement of Daguerre's discovery was compared, even by scientific men. In his classical history of chemistry, Kopp, who, doubtless, wrote from personal acquaintance with individuals present in Paris at the time, in seeking for a parallel to the excitement occasioned by Davy's great discovery of the metals of the alkalis, in the early part of the century, says of it, "something like that occasioned by Daguerre's discovery in our time." From that date (1839) we pass rapidly backward into the hazy prehistoric period that belongs to every branch of science, from which many interesting items have been recovered by the curiosity aroused by the practical success of his process. From that date forward we have only to note an immediate, rapid, steady development. There is no disposition by this statement to unduly magnify the merits of Daguerre, much less to minify the claims of others, but simply to accentuate the epoch-making character of his discovery. So much has been written with a bias, in many cases inspired by national partiality, and is being so frequently repeated, that the salient and indisputable facts are often overlooked. It may not, therefore, be out of place here to bring together rapidly facts generally received in such connexion and sequence as to exhibit the origin and making of modern photography.

#### PHOTOGRAPHIC RESEARCH SEVENTY YEARS AGO.

What, then, was the condition of photographic research in 1824? Overlooking all alchemistic and other accounts, however curious and interesting, but without effect upon the history of photography, we find, in 1777, the illustrious Swedish chemist, Scheele, engaged in investigating scientifically, carefully, we might almost say exhaustively, the interesting fact, long known, that silver chloride darkens under the influence of light. He allowed sunlight that had passed through a prism to fall upon silver chloride spread upon paper on the floor of the darkened room, and demonstrated that the violet ray was most effective in producing the change. He further established the fact that chlorine was liberated in the operation. But this, the usual, statement of these facts, and a correct one from the point of view of to-day, conveys a very wrong impression of Scheele's purpose, and of his interpretation of his results. The object of his investigation was not the action of light on silver chloride, but the action of silver chloride, or horn silver, as it was then called, on light, and he did not state his results in the way given. The scientific world of that day was dominated by the curious, almost fanciful, phlogiston theory of combustion. That hypothetical something, or nothing, was always present in their thoughts whilst investigating. Scheele was trying to demonstrate that phlogiston was present in sunlight, and he explained his results by saying that silver calx removed the phlogiston most rapidly from the violet ray. The change in the silver chloride he explained as loss of dephlogisticated spirit of salt. Disentangled, then, from the theories of his day, Scheele made two important discoveries which we recognise to-day as photographic. Many eminent investigators repeated his experiments. In 1798 Rumford, as the result of elaborate experiments, contended that the change was due to heat, and not to light. In 1801 Ritter, incited, doubtless, by the detection of heating effect, by Sir W. Herschel, the year before, in the space beyond the red of the spectrum, announced the discovery of photographic effect in the invisible region beyond the violet. He also demonstrated an opposition of the effect of the red and violet rays, and explained it by an oxidising action of the former, and a reducing action of the latter. In 1802 Wollaston arrived at substantially the same results; but, in investigating Ritter's explanation of the opposition of the red and violet rays, from which he dissented, he employed a photographic substance of a new class, namely, gum guaiacum, and considered its change of colour under the influence of light. In 1804 Young employed a silver salt successfully to investigate Newton's rings projected by a solar microscope. So Vogel, Seebeck, Senbier, Davy, Berard, in fact, almost every scientific man of prominence of that period, pursued similar lines of investigation. The motive of most of these was strictly scientific, such as the determination whether the solar beam contained three essentially different agents, of which the actinic was but one, the photogenic production of the colours of the spectrum, the exploration of the invisible regions of the spectrum, and the like. In the apparent chaos of carefully observed facts there are many that advanced photography of to-day imparts new interest to and that might well repay reinvestigation. There was but one notable attempt at practical application of facts. In 1802 Thomas Wedgwood, son of the porcelain manufacturer, in connexion with Davy, published a method of copying pictures painted on glass,

fibres of leaves, wings of insects, and so forth, by pressing them in contact with paper coated with nitrate or chloride of silver, and exposing to sunlight; but, failing in all their efforts to prevent the continued darkening of the pictures obtained in this way by the action of light, they were obliged to preserve them in the dark, and could only examine them by candle light.

#### NIÉPCE AND DAGUERRE.

During the decade preceding the founding of the Institute there was almost a complete lull in scientific activity along these lines. During this time, however, there was one man, Nicéphore Niépce, who had been working on from 1814, with great tenacity of purpose, trying to fix the images of the camera. He had sufficient suggestions of success to keep him at work. He did not approach the subject from the scientific side, nor from purely scientific impulses, but with a desire for immediate practical results. He had become interested in the recently discovered process of lithography. The difficulty of procuring suitable stone suggested the use of metallic plates, and it occurred to him to substitute light for the hand in drawing the pictures. After experimenting with various substances, among them silver chloride, he discovered that bitumen of Judea was rendered insoluble in certain solvents by the action of light. He coated metallic plates with a thin varnish of it, exposed them when dry to the sunlight under engravings previously varnished to render them more transparent, and then dissolved out the unchanged bitumen of the parts protected from the light. After a measure of success in thus copying engravings, he experimented with the pictures of the camera on similar plates, and there seems to be no question that about 1827 he had obtained pictures by this process, however imperfect. He named the process "heliography."

In 1824 Daguerre, entirely ignorant of Niépce or his work, entered upon a similar pursuit, upon parallel lines, inspired by a similar desire for immediate practical results. He was a scene-painter in Paris, and an artist of no mean character, and of great popularity in that city. The diorama, invented by him, was the sensation of the day. Crowds were entertained by its surprising effects. He was aided by the camera in preparing his scenes. The wish to fix its fleeting pictures might occur to any one, but it took complete possession of him, although the pursuit was more unpromising than that of the alchemists. He worked alone and in secrecy, with but little encouragement. His methods were empirical rather than scientific. About 1826 he learned of another worker in the same field. He immediately wrote to him, Niépce, distrustful of the unknown writer, threw the letter in the fire. A letter a year later met with a better reception. The correspondence continued, at first with almost suspicious reserve. Niépce visited Paris, met Daguerre, was greatly impressed with his diorama. Both seemed to enjoy an exchange of experience that belonged to them alone. Niépce wrote his son that Daguerre persisted in regarding his (Niépce's) process as better than his own, but that one thing was certain, they were entirely different. A partnership, styled Niépce-Daguerre, was formed, with equal interest. The article of agreement, dated December 14, 1829, was signed by Niépce as "Landowner, at Chalons-sur-Saone," and by Daguerre as "Artist-painter. Member of the Legion of Honour, Manager of the diorama." Under the terms of the partnership, Niépce contributed his process of heliography, and his experiments, which Daguerre agreed to assist in improving, and also contributed his improved camera, which was regarded as of great value, as it most likely was. Daguerre improved the process, but was diverted altogether from it by the accidental discovery of the sensitiveness of silver iodide to light. In the bitumen pictures the blacks of the original were represented by bright polished metal, from which the unchanged bitumen had been removed, and the whites by the changed bitumen. To convert these negative pictures into positives, Niépce experimented with a variety of substances, among them vapour of iodine, to darken the exposed metal, and then dissolved off the bitumen from the whole plate. It is said that Daguerre observed that the shadow of a spoon that happened to be lying on a polished silver plate that had been exposed to the vapour of iodine was permanently impressed upon it. Slight as every one knows this direct effect of light on iodide of silver to be, Daguerre seemed to see in it new possibilities for camera pictures. Niépce, however, after experimenting with it at Daguerre's suggestion, expressed regret that he had lost so much time in following his recommendation. He repeated that he did not see that they could hope to secure any advantage from this process, and suggested other substances as better. Niépce died in 1833. Success seemed as remote as at the formation of the partnership. The partnership was renewed with the son, Isidore Niépce. Daguerre now entered with even greater enthusiasm and undivided effort into the pursuit. He neglected the diorama, and lived in his laboratory, to which no one had access, not even Isidore Niépce. He became so much wrought up by his unsuccessful experiments that his wife, according to Dumas, consulted physicians in regard to his sanity. Finally there came to his assistance an accident which conducted to a fundamental discovery, as fundamental to-day as it was then. The mode of the discovery has not only a species of romantic interest of its own, but, as I recollect it, given by Professor Liebig in one of his lectures, as one of the finest specimens of the inductive method, coming thus from one thoroughly familiar with the Paris of that day, it has an added air of authenticity that may excuse the narration of it in this con-



nexion. Daguerre's method of experimenting was to expose polished silver plates to the vapour of iodine until coated with a layer of iodide, then to subject them to the image in the camera. These plates, always without the hoped-for result, or at most the very feeble direct effect, were repolished, re-iodised, re-exposed in the camera, with the same disheartening results. On one occasion, upon removal of such an exposed plate from a closet in which it had been stowed, to repolish it for a new experiment, to his great surprise he found upon it the view to which it had been exposed in the camera, not an uncertain, feeble picture, such as he had been accustomed to, but a strong, clear, unmistakable one. He exposed another plate in the camera without visible effect, stowed it in the closet, again to find the invisible picture put in an appearance. He had no way of explaining the result. All his years of investigation furnished him no clue to the influence at work. He set about systematically to discover it. He could only conclude that it must be something in the closet. He placed plate after plate, after exposure in the camera, in the closet, each time first removing something from the closet. Each time the invisible became visible. At last nothing remained but some mercury spilled on the floor of the closet. Thus by this method of elimination the magician was detected. It was a short step to subject plates that had been exposed in the camera to vapour of mercury, and the Daguerreotype process was complete.

#### FOX TALBOT.

This early period of photography cannot be passed over without mention of the name of Henry Fox Talbot, of England. He was a man of many-sided scientific character, and an independent investigator in the photographic field prior to Daguerre's discovery, and therefore not inspired by it to investigation. In 1839, January 31, he read a paper before the Royal Society, entitled "Some Account of the Art of Photogenic Drawing," &c., embodying a practical process on paper based on the abandoned process of Wedgwood and Davy, which he improved and also completed by fixing the pictures, although imperfectly, in a solution of common salt or potassium iodide. The substitution of sodium hyposulphite, first suggested by Sir John Herschel, for the iodide soon followed. He further suggested indefinite photographic multiplication of the paper originals, by taking impressions from them on similarly prepared paper, and, upon the publication of Daguerre's discovery of a latent effect of light, was quick to apply it to the preparation of a paper sensitive enough for camera impressions, and, by rendering these transparent, greatly facilitated indefinite photographic multiplication of the original negatives as positive pictures, although the terms negative and positive, in this connexion, were first used by Herschel. His Calotype process was patented by him in 1841. Although there is nothing in it that would call for the association of his name with those of Daguerre and Niépce, yet, as an independent investigator, scientifically trained, he deserves prominent mention, as one whose applications of known facts at once greatly stimulated the practice of photography and its consequent rapid improvement. In addition to the introduction of photographic multiplication by the use of a translucent support for the sensitive compound of silver, the replacement by him of the formation of such a compound by the direct combination of the halogen with the silver, as in Daguerre's process, by the reaction between silver nitrate and a metallic haloid, was typical of more modern photography.

#### DR. J. W. DRAPER.

It is interesting at this point to note the reception of the discovery in America. There was at least one man thoroughly ready to appreciate the scientific features of the process and to apply it. The numerous papers contributed to the *Journal of the Franklin Institute* by Dr. John W. Draper, several years before Daguerre's discovery, detailing investigations, are classical, and surprise us even to-day by their minute accuracy and anticipation of solutions of questions long subsequent. But he escaped making Daguerre's discovery. He succeeded, however, in doing what Daguerre had not yet succeeded in accomplishing. He took the first portrait by Daguerre's process, although, as we shall note, this claim is disputed in favour of a Philadelphian. He took the first photograph of the moon. He applied the process in a variety of ways in scientific investigation. But nowhere did the announcement lead to practical application as quickly as in Philadelphia. The old American Philosophical Society and the then young Franklin Institute had members alert for anything that was new in science. Joseph Sexton took the first photographic view in America, out of a window of the Mint with very crude apparatus in October 1839. Robert Cornelius, a lamp-maker, took a portrait in the latter part of 1839, some claim before that made by Draper. The Franklin Institute, in its Exhibition in 1840, displayed some of the first results. The *Ledger*, in its account, October 12, states: "Throughout the room are various specimens of the Daguerreotype. They consist mostly of miniatures." This shows great enterprise for a day of sailing vessels, when it is remembered that Daguerre's process had only been made public in Paris in August 1839. But the part that Philadelphia had has been so fully treated in a lecture before the Franklin Institute, several years ago, by Mr. Julius F. Sachse,\* and published in its *Journal*, that I can do no better than to refer to it.

\* Sachse, "Philadelphia's Share in the Development of Photography," *Journ. Frank. Inst.*, 135, 271.

But one fact of permanent effect, and of exceeding interest in this connexion, is the strong body of amateurs in the art which sprang up in Philadelphia, and which has always characterised it; strong not only in numbers, but in scientific character and motive.

I think I am not mistaken when I assert that the first independent photographic society in America was the Philadelphia Photographic Society, as the American Philosophical Society was the earliest scientific society. It was organized in the heroic days of photography, when the practice of photography meant a great deal, when press-the-button and snap-shot work were unknown. Members of the Philosophical Society and of the Institute were active in founding it, and making its creditable record. Dr. Coleman Sellers, President of the Institute, was a prolific writer on photographic subjects, always instructive and practical. Joseph M. Wilson, who is doing so much to give Philadelphia pure water, also a former President, has been an enthusiastic amateur from his boyhood. There are so many others, who have not filled that high position, active in advancing photography, that I must refrain from mentioning any, except Matthew Carey Lea, so well known as one of the most indefatigable, painstaking scientific investigators, whose contributions to this subject, largely along lines all his own, are not only of present practical value, but full of promise to investigators, which the future will doubtless realise. His apparatus, bequeathed to the Franklin Institute, will form a fine nucleus for the encouragement of photographic investigation. When Professor Henry Morton, then Secretary of the Institute, organized the highly successful expedition to photograph the total eclipse of 1869, under the auspices of the National Government, he was able to draw largely from the membership of the Institute for his efficient corps of observers.

#### RUSSELL; MADDOX; SAYCE AND BOLTON.

But to return to the development of photography. One of the most tantalising defects of the process, as published by Daguerre, was its slowness. It suggested portraiture, but just came short of desired success. In 1840 the requisite increase of sensitiveness was obtained by the use of bromine in connexion with iodine, and the trio of silver haloids in use to-day was completed. This use of bromine as an accelerator, as it was called, was published by Goddard, of London, in 1840. The honour of its introduction is also claimed for Philadelphia, where Dr. Paul Beck Goddard—a singular coincidence of names—employed it as early as 1839, but, as he kept the fact a secret until 1842, whilst we are privileged to believe that he first used it, we cannot claim the honour for him as against prior publication. The process, it seems, was employed at once commercially here with greater success than in France. Daguerreotype portraits were taken at five dollars each. The Calotype negatives of Talbot, with the objectionable grain of the paper, suggested better things. Glass had been used by Herschel in some experiments with silver chloride, and negatives on glass, with albumen as the vehicle of the silver iodide, which afforded excellent paper prints, were first produced by Niépce de St. Victor, nephew of Niépce, in 1847. The Daguerreotype began to recede in importance, and amateur practice of photography was stimulated. In 1850 the greatest advance since the time of Daguerre was made by the introduction of collodion, a solution of gun-cotton, then recently discovered, as a vehicle of the sensitive silver iodide. Glass and collodion seemed to possess all desired properties for photographic purposes. Nothing better seemed possible. The Daguerreotype disappeared entirely. A collodion positive process on blackened metal, an American invention, in a measure took its place, and survives to this day as the tintype. The collodion process, however, was soon found uncomfortably cumbersome by the growing number of amateurs, requiring as it did the completion of the whole process whilst the plate was still wet, necessitating the impedimenta of tents, bulky solutions, fragile vessels, &c., for outdoor work. The dispute continued for a decade between *humidus* and *siccus*, as to the relative merits of the wet process and various dry-plate processes devised from time to time. At last, in 1862, the tannin dry-plate process of Major Russell seemed to be satisfactory in results, but slow in exposure, and time-consuming in the preparation of the plates. In the wet-collodion process the metallic haloid was added to the collodion, and the plate coated with it immersed in a solution of silver nitrate, where the reaction took place, producing the silver haloid. The question naturally arose, Why not eliminate one of the most troublesome factors of the process by adding the silver salt to the collodion? In 1864, Bolton and Sayce overcame the intrinsic difficulties, and produced an emulsion of silver haloids with collodion suitable for the purpose. The process became commercially available, and bade fair to revolutionise photographic practice; but, in 1871, Dr. R. L. Maddox succeeded in producing workable plates with an emulsion of gelatine and silver bromide. The process was at once taken up, and brought by rapid stages by different workers to a high degree of perfection. Dry plates of wonderful rapidity, of great certainty and ease of manipulation, and of practically indefinite keeping qualities, were soon placed upon the market. Again a Philadelphian, and member of the Institute, John Carbutt, manufacturer, was among the very first to recognise the commercial possibilities of the new process and erect a plant to meet the demand sure to spring up. The professional adopted them slowly. The amateur recognised in them the long-desired dry plate. Photographic societies in the United States, mainly of amateurs, increased, in the decade from 1883 to 1893, from 9 to 120, or more than



twelfold. Manufacture of cheap, but good, dry-plate outfits, which dispensed with the more expensive wet-plate holder, assumed very important proportions. Dry plates, and improved developers and appliances for dry plates, began to predominate in the advertising columns of the journals, and detective cameras, as hand cameras were generally called at first, were largely advertised in periodicals in which photographic advertisements had not appeared before. But the amateur complained now of the weight of glass to be carried. A return to paper for negative purposes was made, expensive apparatus devised to coat it, and with excellent results. The critical amateur withheld his patronage. At last a substratum was produced in celluloid—singular to say, with gun-cotton as a chief ingredient—having the essential photographic properties of glass, but tough as well as light; but still the enthusiastic, patient amateur, with almost infinite capacity for trouble, but always seeking lines of least resistance, striving to avoid the unnecessary in his work, and keenly sensitive to discomfiture, complained that he had to retire to the dark room or changing bag before his day's work was half done. Again his complaint was met by the daylight loading roll of sensitive film, which will permit a year's snap-shooting without entering the dark room.

VOGEL; IVES; HERSCHEL; WILLIS, &c.

The discovery by Professor Vogel, in 1874, of the possibility of rendering plates sensitive to colours generally regarded as non-actinic, by treating them with suitable dyes, constituted the most distinct advance in photography since the days of Daguerre, widening its range of applications. Fredk. E. Ives, of the Institute, published the first perfected orthochromatic process. Orthochromatic plates soon appeared in the lists of up-to-date manufacturers.

The processes for multiplication by action of light have sympathised with the general progress of the negative practice, but have not kept pace with it. The direct printing-out processes in use from the earliest albumen-coated silver-chloride paper down through the papers of various names, coated with gelatine or collodion as vehicles, with their dependence on daylight for printing and their subsequent operations, are ante-Daguerrean in principle, and almost anachronisms in this day. The developing papers, with their independence of daylight, and in the "Velox" type permitting developing by comfortable gaslight, and, with suitable apparatus for exposure, yielding 5000 prints per day, seem more nearly up to date.

But all processes with silver are viewed with distrust in regard to permanency. Two processes at least are regarded with more favour in this respect, and are recommended by the National Photographic Records Association of Great Britain for its photographs. The carbon or pigment process, which carries back in principle to the time of Niépce, based upon the discovery of Mungo Ponton in 1839, of the loss on exposure to light of solubility or stickiness by gelatine and other organic substances, mixed with alkaline bichromates. The other, the platinum process dependent upon the reduction of a ferric to a ferrous salt by light, one of the many discoveries of Sir John Herschel, and the reducing action of the latter on a platinum salt also present in the paper. The process, originally patented by Mr. Willis, now free, is simple in manipulation, and yields artistic effects as well as permanent prints. The blue print process, humblest of all, but yielding a larger acreage than all others, also originating with Sir John Herschel, is based on the reduction of a ferric salt, and, as practised to-day, also in some degree upon the reduction of a ferricyanide.

But a thought ever present with investigators has been the multiplication of pictures by other than purely photographic methods. Niépce started with the motive of etching plates by means of light for printing. Attempts were early made to convert the Daguerreotype into a printing surface. In recent years processes based on the properties of gelatine mixed with alkaline dichromates have been commercially highly successful, as photo-lithography, the heliotype, Woodburytype, swelled gelatine and wash-out gelatine processes, &c., some capable of rendering all the tones, others restricted to black and white, but none of them meeting the growing demand for typographic blocks capable of rendering the shades of the original. At an early day it was found that, by breaking up the shades by a grain imparted to the printing surface in different ways, half-tones could be simulated, and the line screen was one of the methods for so doing. But in none of these methods was there an attempt at what might be termed a discriminating grain, a precise rendering of the shades, as an engraver would do, by lines and dots of varying sizes and separation. In 1891, Frederic E. Ives, of our Institute, patented and conducted commercially a process that might be characterised as ideal in this respect. By it all the tones of photographs and wash drawings could be faithfully rendered by typographic blocks. The testimony most conclusive on this point, perhaps, is the criticism of the art critic of one of the leading dailies of New York of engravings in a work which called for art of high character. To quote his words in regard to some pictures selected by him as the "finest in the book," he says: "Without detracting from the artist's meed of praise, it may be added that the most remarkable thing about these illustrations is the extraordinary skill displayed by the engraver," and he speaks of the "marvellous delicacy of precision and touch," "power of taking up the theme submitted by the artist," &c., and yet they were soulless photo-engravings by Mr. Ives's purely mechanical process. The blunder of the critic does not reflect on his professional

character, but only on his ignorance of the resources of photography. This process has been largely replaced in recent years, for the requirements of the general trade, by the more facile line screen half-tone process, greatly improved by the variation and proper manipulation of the screen and stops employed, and by attention to the optical conditions involved.

#### COLOUR PHOTOGRAPHY.

Colour photography, the dream of every one interested in photography, has seemed to many beset with apparently incompatible conditions, and the unattainable limit of photographic progress. It has none the less, from the earliest period, engaged the attention of the ablest investigators.

A measure of success has been announced from time to time, by Seebeck in 1810, and subsequently by Sir John Herschel, Becquerel, Niépce de St. Victor, Poitevin, Simpson, and others. In all cases a difficulty in fixing the pictures has prevented a much-desired general inspection. The following extract from a letter of Sir John Herschel, in 1865, is one of the most favourable accounts: "I received a complete coloured spectrum picture from Becquerel several years ago, which is still as fresh in colour as when received. The whole spectrum from end to end, is not brilliant, is still distinct. I seldom examine it, and only by lamp light." The more recent process of Lippmann, founded on interference of light, is of great scientific interest, but, if it has a commercial future, has not yet passed its experimental stage. Other less direct processes seem more practicable. The so-called Joly or McDonough process, dependent upon a taking screen of lines in intimate contact, coloured in series red, green, and blue, placed before the plate in taking the negative, and used in viewing the result, is also short of commercial success. The heliochromic process of Frederick E. Ives, in conjunction with the kromskop, comes nearer the complete realisation of reproduction of natural colours, and is commercially available. It requires three negatives simultaneously taken, representative of the Young-Helmholtz-Maxwell colour sensations, and three positives simultaneously presented to the eyes in the kromskop, by light through glass or screens (red, green, and blue-violet) suitably coloured for each. The camera for taking the negatives and the instrument for viewing the positives are ingenious and practicable. Until some process, based upon some new material, or new principle, is discovered, this process is likely to hold its present place. Possibly the silver photo-haloids investigated by M. Carey Lea may yet lead to the perfect colour process.

#### X-RAY WORK.

The scientific world, hardly recovered from the shock of surprise at Röntgen's discovery, and undecided whether it is dealing with rays or emanations, led by it, seems entering a new and broader field of investigation, almost uncanny in some of its aspects. The terms Becquerel rays, Russell rays, metallic radiations, vaporography, and the like are full of import. As stated by Dr. Crookes, "Some bodies without special stimulation are capable of giving out rays closely allied, if not identical, with those of Röntgen, and it would almost seem, from the important researches of Dr. Russell, that this ray-emitting power may be a general property of matter, for he has shown that nearly every substance is capable of affecting the photographic plate if exposed in darkness for a sufficient time." The list of active substances is a long one, to which a recent investigator has added the human body. The rays pass through many opaque substances, and are checked by others. They excite fluorescence. Already they have led to the discovery of a new metal by Madame Curie, and named polonium, possessing 400 times the energy of uranium, which has hitherto held the highest place. It was announced in the morning paper that Professor George F. Barker has brought with him from Paris a specimen of the new metal, and we trust we may look for some demonstration of its properties at an early day. This energy seems to be without exciting cause, and without perceptible diminution. If radiant energy, may not perfumes, which have been regarded as material emanations, be of the same character, and the rose emit rays that will affect a properly sensitised plate?

#### THE LATEST APPLICATIONS.

Photography and the microscope, too, have gone hand in hand with a more intimate sympathy even than that between the camera and the telescope. Among the earliest amateurs of highest character was a large percentage of experts with the microscope. It was in the decade following the founding of the Institute that the microscope began to assume something of its present character as an instrument of delicacy and precision. In 1831 the factory of Ross was established, and, under the stimulus and co-operation of such men as Herschel, Airy, Powell, and, more especially, Lister, improvements in the optics and mechanics of the microscope were rapidly made, so that, at the discovery of photography, microscopy had an entirely modern aspect, and it recognised at once a new ally. Dr. Draper immediately took micro-Daguerreotypes. From this time the improvements in optical appliances urgently demanded by the microscopist were ably seconded by the photographer, and both combined were largely instrumental in occasioning the marked progress in practical optics, which, in turn, reacted to advance photography and microscopy. Even in the days of slow wet collodion, good work was done with the microscope, and even stereo photo-micrographs were taken



by Professor Rood. The rapid dry plate, sensitive to all or any desired colours, has nowhere contributed more to the advance of photographic practice than with the microscope. It has become to it only less the observing and recording eye than to the telescope. The intimate connection between the microscope and the camera is also well exemplified in the Institute, where the gifted Zentmayer gave the world its best model for the microscope, and the lens which bore his name long filled a place entirely its own in photography, and when the Government placed the administration of the Total Eclipse Expedition of 1869 in the hands of Professor Morton, then Secretary of the Institute, it was unnecessary to seek further for the complete solution of the then new practical optical questions involved in such an enterprise.

In chemistry, Dr. Crookes, by aid of photo-spectroscopy and ortho-chromatic plates, has added the metal monium to the list, with its characteristic lines far out in the ultra-invisible light, in the phosphorescent glow of yttria under molecular bombardment in *vacuo*. Meteorological science is enriched by photography. It is pertinent to mention the interesting contributions of W. N. Jennings, of the Institute, to the study of lightning discharges, and the work of C. Francis Jenkins in the conversion of a scientific toy into the panthascope, which has found its extension in the kinetoscope, and which earned for him the Cresson medal of the Institute. The kinetoscope, with its miles of photographic films, as exhibited first by our H. R. Heyl, has found applications unanticipated in recording the movements during a solar eclipse and of growing plants, and has gone to the front with the army in Africa. In the industries the applications of photography are of infinite variety in character and importance. It is proposed to furnish cards for the Jacquard loom, and thus make tapestries commonplace. It will furnish water marks for paper capable of 100,000 impressions. It reproduced the *Encyclopædia Britannica* at one-third the cost of type. It preserved the valuable MS. copy of *Century Dictionary*, which was practically unseizable, in miniature form against loss by fire. It may, in the future, in the same way, find a place to economise shelf room in our libraries by compressing books that are seldom or never read. Its applications are well known in the copying of inscriptions, even in dark interiors, in the preservation and duplication of valuable documents and papers, in the detection of forgeries, especially by the method of composite photography as developed by Dr. Persifer Frazer, in the furnishing of legal evidence in general, in the detection of criminals, &c. In Canada, 50,000 square miles have been plotted by means of the photo-theodolite. In the late war the camera went to the front, and has furnished invaluable records. *Apropos* to this, it is only necessary to recall Capt. Wise making exposures whilst charging up San Juan Hill. In the present African war it promises to play an important part in reconnaissance through the tele-photo apparatus that accompanies the British forces.

CHARLES F. HIMES, PH.D., LL.D.

#### A PRINT AND PLATE-WASHER.

MR. R. GREENLAND has patented a piece of apparatus for this purpose. It consists of a tank or dish for washing photographic prints, plates, films, and the like, as shown in fig. 1, containing a tray or trays, as

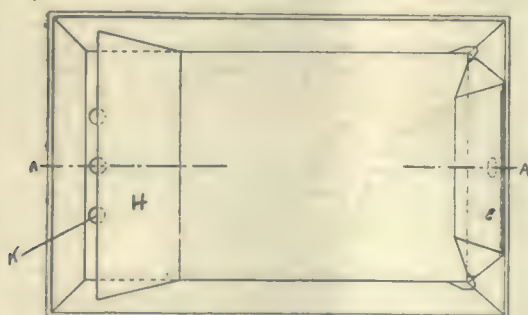


Fig. 1.

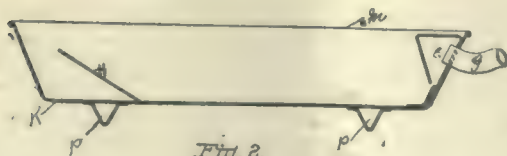


Fig. 2.

fig. 3. Fig. 4 shows a side elevation of fig. 3. The said trays to be made in separate compartments, as shown at v (fig. 3). Each compart-

ment having all four sides hinged, shown at b, and covered with a wire-netting. The framework of the bottom of tray, v (fig. 3), forms spindles for the sides, b1, b2, b3, and b4, to work upon. The said sides are looped round v at o. b1 goes under b2 and over b4. b2 goes over b1 and over b3. b3 goes under b2 and under b4. b4 goes under b1 and over b3. Projections are shown at w, which prevent sides falling on to prints in the compartments. The said sides of tray, b, can be opened to place prints and the like in, and closed and fastened as shown in fig. 3 at 6; by this means the water passing under and over the said prints cannot dislodge them, or allow them to come in contact with each other. The bottom of tray is covered with netting, as shown at f (fig. 3). Fig. 2 is section, A, A, of fig. 1. A tube, g, is fitted to tank; the other end of

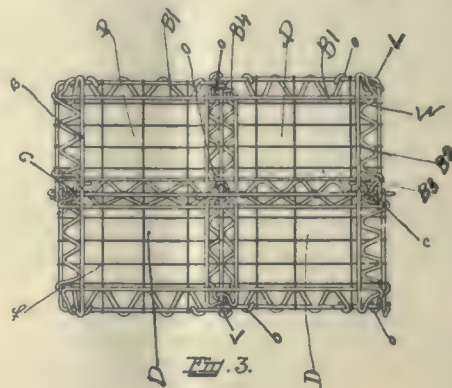


Fig. 3.

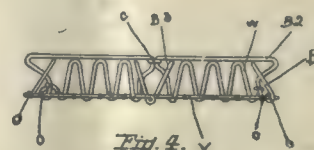


Fig. 4.

tube can be fitted to any ordinary water tap. Water passing down the said tube, g, into a director or guide, n, (as shown in fig. 1 and fig. 2,) to break the force and send a steady current along the tank flowing over and under the print in its course. The water then passes over a partition, weir, or overfall, h, which slopes at an angle, as shown in fig. 2, from the bottom of tank towards the tap, and away from entrance of water. Holes are placed in the bottom of tank, as shown at x, under partition n, to let off the exhaust water. Any light that might enter exhaust holes, x, is prevented from coming in contact with sensitive matter in the tank by the said weir, or overfall, or partition, n, which slopes directly over the said exhaust holes, x. The tank or dish is fitted with a light-tight lid, w (fig. 2). The tank is raised upon legs, as shown at r (fig. 2).

#### TO PHOTOGRAPH THE SOLAR CORONA IN 1900.

In a late number of the *Oakland Inquirer* we find a pretty full statement of the preparations of Charles Burckhalter, Director of the Chabot Observatory, at Oakland, Cal., for the expedition which he has organized to observe the total solar eclipse of May 28, 1900. In the last number of this publication, says Mr. W. W. Payne, in *Popular Astronomy*, will be found a large plate, as frontispiece, which shows the full length and width of the track of totality, to scale, as it passes over the southern part of the United States. Mr. Burckhalter's point of observation for his party is somewhere in the State of Georgia.

The particular reason for calling attention to the work of this expedition is to speak of the novel photographic instrument that Mr. Burckhalter is expecting to use on that occasion.

Some time ago Mr. Burckhalter believed that he had devised a plan which would materially assist astronomers in photographing the solar corona in regard to regulating the exposure of the sensitive plate for exterior and interior portions of it. So far, by the ordinary methods of photographing this delicate and most beautiful phenomenon, it has been quite impossible to secure on the same plate the wonderful detail of the inner corona and also the faint exterior streamers which make up the outer corona. The reason for this photographers well understand and any one may easily realise, when it is said that the time of exposure of any object depends on its brightness. The brighter the object the shorter should be the time of exposure to get its structure in full detail. If the exposure of a bright object, like the full moon, is too long, the light portion of the surface will be covered with blotches of light, in which most of the interesting detail is lost. In the darker parts of the surface, for example the seas, more detail will appear, for the simple reason that such parts need longer exposure to bring the detail desired.



This is the main point on which Mr. Burckhalter has been working in relation to photographs of the solar corona. The corona of the sun as seen in the period of totality in an eclipse is pearly white in colour, even brilliantly so, and extends outwards from the sun in all directions to a distance of one-half of the solar diameter, and also in some directions much further, in the form of streamers that gradually become fainter until lost entirely in the dark sky at a distance of two or three diameters of the sun.

That part of the corona which lies near the sun is intensely bright, and made up of varied and delicate structure so complex, distinct, and impressively beautiful, that the astronomer longs to have some means to get and keep the charming picture always. Then, when the eye is turned to the outer corona and its streamers, the brightness diminishes so rapidly that the contrast is very marked, and the great difficulty of photographing both parts of it on the same plate at once immediately appears. The apparatus devised by Mr. Burckhalter to overcome this very troublesome condition consists of two telescopes, one known as the Pearson photographic telescope, and the other as the Pardu lens. The focal length of the Pearson lens is said to be fifteen feet. The manner of mounting the telescopes is not fully enough stated so as to give a clear idea of this part of the preparation. The aim appears to be to have the two tubes of the telescopes so related, that photographs by them both may be taken in duplicate under the same conditions if so desired. The special device for work on the corona in the brief period of totality has for its object the exposure of the sensitive plate in such a way that each part shall have the right time limit. In this way it is expected that the interior corona will not be over-exposed, nor its exterior parts under-exposed, a result which every astronomer may well hope can be secured. This carefully graduated exposure is to be effected by means of a diaphragm, revolved by clockwork before the sensitive plate, which will vary the time of exposure for different parts of it from two hundreds of a second to ten seconds of time, or for other differences of time as desired. If such an arrangement for using the varying intensities of the light of the corona can be gained successfully, very interesting results ought to be secured. The period of totality in this eclipse will be only eighty-six seconds, and the width of the black path on the earth's surface about forty miles. This very short time of totality will afford observers scant opportunity to do the many things planned for, yet astronomers have learned to work more rapidly in later years, and the improved apparatus now in use will make up to some extent for lack in length of totality.

The things to be attempted during the total solar eclipse in May 1900 are a photographic search for intra-mercurial planets, and a study of the brightness of the sky. Professor W. H. Pickering is reasonably sure that a body the size of an average asteroid, say twenty miles in diameter, within 15,000,000 of miles of the sun, would show on photographic plates he uses. It is encouraging to know that astronomers do not give up the search for these small bodies near the sun, although work during the past twenty years in this direction has not been successful. Another thing is the study of the details in the structure of the corona. The photographic work already spoken of may aid materially in this, but there is also need of careful visual work with good telescopes, in this country, Spain, and Portugal, for the sake of comparing results obtained from the same kind of work in a prearranged programme. This idea seems to be in considerable favour with those using the telescope chiefly.

One astronomer suggests the desirability of measuring the "rate at which the radiating power of the solar atmosphere is diminished with the altitude above the photosphere, and to obtain a rough quantitative comparison with photospheric radiation." Other themes are the lower red in the spectrum, the "flash spectrum" work with the photometer, and the polariscope. Though the time of the eclipse be short, it is probable that many American parties will participate in the observation, and, if the day be a favourable one, some useful results will be expected.

## ON THE USE OF MERCURIC IODIDE FOR INTENSIFICATION.

[Translated from the Bull. de la Soc. Franc. de Photographie.]

THE use of mercuric iodide as a direct intensifier of negatives was first mentioned by Edwards\*, who used mercuric iodide dissolved in sodium thiosulphate. Later, Vogel† made some slight modification in the composition of the solution given by Edwards, who afterwards confirmed Vogel's results‡.

According to these writers the intensifier is prepared by precipitating 4 grammes of bichloride of mercury, dissolved in 200 c. c. of water, by means of 10 grammes of potassium iodide dissolved in 65 c. c. of water. About 8 grammes of sodium thiosulphate is then added, dissolved in 65 c. c. of water. These proportions correspond to one molecule of mercuric iodide to two molecules of sodium thiosulphate with excess of potassium iodide.

The proportion of sodium thiosulphate in this formula must not be

\* *Photographic News*, 1879, p. 514. THE BRITISH JOURNAL OF PHOTOGRAPHY, ALMANAC, 1881, p. 57.

† *Photographische Mittheilungen*, xvi. p. 340.

‡ THE BRITISH JOURNAL OF PHOTOGRAPHY, 1879, p. 361.

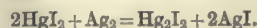
increased, since, as we shall see later, the intensified image partially disappears in sodium thiosulphate, and intensification no longer takes place when an excess of this salt is present.

The intensification of negatives with mercuric iodide and sodium thiosulphate possesses not only the advantages of giving great vigour and of being capable of moderation by addition of water, but also of taking place directly in one solution, so that no second bath is required before the colour and intensity of the negative can be judged; but it has one important defect, the intensified image is not permanent, with the lapse of time it becomes yellow and decreases slightly in density.

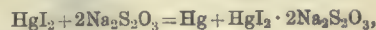
The cause of this change has never yet been definitely stated. In order to find the means to remedy the defect, we have first endeavoured to clear up the theory involved in the intensification process.

*Hypotheses of the Reactions involved in the Use of Mercuric Iodide and Sodium Thiosulphate for Intensification.*—It may be supposed that the solution of mercuric iodide in sodic thiosulphate is due to the formation of a double salt of the formula,  $\text{HgI}_2 \cdot 2(\text{Na}_2\text{S}_2\text{O}_3)$ , which corresponds with the relative proportions of the substances entering into the composition of the reducer. On the other hand, it is conceivable that double decomposition takes place, and iodide of sodium, and thiosulphate of mercury and sodium are formed. Thus,  $\text{HgI}_2 + 2\text{Na}_2\text{S}_2\text{O}_3 = 2\text{NaI} + \text{HgNa}_2(\text{S}_2\text{O}_3)_2$ , but the ease with which iodide of mercury is recovered from the solution favours the first rather than the second hypothesis.

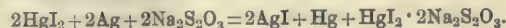
Let us assume, then, that the iodide of mercury exists simply dissolved in the thiosulphate. We may suppose that, by reacting with the silver image, it is reduced to mercurous iodide:—



At a second stage, this mercurous iodide would be decomposed by thiosulphate of soda, forming mercuric iodide and metallic mercury. The mercuric iodide, thus re-formed, would be again reduced to the mercurous state by the silver of the image; and so the cycle of changes would go on, the thiosulphate taking part in the reactions only as a solvent of mercuric iodide.† The equation would be as follows:—



or the whole reaction can be written thus:—



The intensification would thus be due to a mixture of mercury and iodide of silver.

This hypothesis is to some extent confirmed by the fact that the image thus obtained can be readily weakened by treatment with a solution of thiosulphate of soda, which dissolves the iodide of silver. If only a part of the silver iodide is dissolved, this reduction is only partial; but it is possible to return to the original intensity of the image by completely dissolving the iodide of silver. Only the colour of the image is then modified, having become somewhat browner.

*Rapid Alteration in the Image.*—We have found that the change taking place in the intensified negatives in several months can be produced in a few hours. Hitherto this change has been erroneously attributed to the action of light and air, but it is produced simply by leaving the negatives in water. That it is not the salts present in ordinary water which are responsible for the change was proved by the same result being obtained with distilled water. The image, which is originally a brownish-black, yellows gradually, and the change produced in this way appeared precisely the same as that produced by a long exposure to light or air; it can also take place in the dark.

*Nature of the Change.*—We have endeavoured to determine the character of the substance which is thus produced. We first imagined that the change of colour was due to the formation of mercurous iodide (by the action of mercury on silver iodide), or possibly even of mercuric iodide; but the following reactions show this supposition to have been false:—

1. The compound is not blackened by the usual reagents which convert mercurous iodide into mercury and mercuric iodide, such as sulphite of soda and potassium iodide.
2. Under the action of hyposulphite of soda the image weakens, and the yellow compound dissolves; this would not take place in the case of mercurous iodide, which blackens under thiosulphate of soda.
3. Solvents of mercurous iodide, except thiosulphate of soda, have no action on the negative.
4. It gradually bleaches in dilute nitric or hydrochloric acid.
5. Dilute ammonia has no action on it.
6. It is slowly reduced by reducers of iodide of silver, and the image blackens without any apparent increase in opacity.

It can be supposed that, under the influence of moisture and oxygen, the mercury oxidises and forms with iodide of silver a compound of a

\* Prumm, *Photographische Mittheilungen*, 1880, p. 7. Debenham, *Photographic News*, 1882.

† It is possible to imagine the action consisting in the reaction of mercurous iodide upon thiosulphate to reduce the latter to tetrathionate:—



but the facility with which mercuric iodide is obtained from the solution, and the similarity of the results when other solvents of mercuric iodide are used, lead us to reject this hypothesis.



yellow colour, possibly  $\text{HgO} \cdot \text{AgI}$ . Such a compound would completely answer to the above description.

*Permanence of the Image after Treatment with a Developer.*—We have seen that, when the negative is placed in a reducer of iodide of silver, after a short washing, the iodide of silver is converted into metallic silver, which thus prevents any further change and formation of a combination of oxide of mercury and iodide of silver.

This operation does not appreciably alter the opacity of the image, and it is only by reflected light that the change in the appearance of the film can be discerned, a slight opalescence being no longer visible.

This after-treatment by a developer is therefore advantageous as ensuring the permanence of the intensified negative.

*Use of Sulphite of Soda as a Solvent of Mercuric Iodide.*—Having determined the most likely cause of the fading of negatives intensified with the mercuric iodide solution, we have endeavoured to find whether it would not be possible to find a solvent of mercuric chloride possessing reducing properties, and at the same time capable of being used in great excess of the mercuric iodide, by means of which this fading could be avoided.

We have found that iodide of mercury is freely soluble in a solution of anhydrous sulphite of soda, and that this solution is an energetic intensifier. Unlike thiosulphate, sulphite of soda can be employed in any proportion to the mercuric iodide without destroying the intensifying properties of the solution, since the sulphite has no solvent action on the intensified image.

Using sulphite of soda for this purpose, we have examined the intensifying action of mercuric iodide, and have made experiments on the permanency of the images.

*Formula for Intensifier with Sulphite of Soda and Mercuric Iodide.*—The best results are obtained by the following proportions of reagents:—

Mercuric iodide .....	1 part.
Soda sulphite (anhydrous) .....	10 parts.
Water .....	100 "

The image gradually gains opacity, taking a deep brown colour. The operation can be followed and stopped at the desired stage; it can be undertaken directly after fixation after a simple rinsing of the plate.

By diluting the solution or using less mercuric iodide slower intensification results, but the increase in opacity is always greater the longer the time of immersion.

On the other hand, quicker action results from an increased proportion of mercuric iodide so long as the limit of 2 parts of mercuric iodide to 20 parts of sulphite in 100 of water is not exceeded.

*Changes in the Intensified Image. Means of Avoiding them.*—We have already said that, if an intensified negative is digested in water for about twelve hours, it assumes a greenish-yellow colour, identical with that produced in the case of the thiosulphate intensifier, and due apparently to the same causes. This property seems to prove that the image alters under conditions analogous to those mentioned in reference to the mercury and thiosulphate formula. If, on emergence from the intensifier, the plate is washed in the usual way for from half to three-quarters of an hour, an image is obtained which becomes gradually yellow in a damp atmosphere, but in a dry atmosphere this change only takes place very slowly, and only becomes distinctly visible after several months.

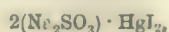
The permanence of the negative can be improved by subjecting the plate to a bath of ten per cent soda sulphite as it comes out of the intensifier, followed by washing in the usual way; but this change can be absolutely prevented in another way, viz., by treating the plate with a reducer of iodide of silver. Any of the well-known developers answer this purpose: para-amidophenol, di-amidophenol, hydramine, pyrogallol acid, or hydroquinone. The silver iodide is converted into metallic silver, and no iodine is left in the film.

A plate thus treated may be left in water for an indefinite period without yellowing in the slightest, and even if the plate has not been treated with a developer, and has, in course of time, become yellow, the process can still be applied and the image converted into the metallic state.

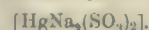
*Reducing the Intensified Image.*—The intensified image can be reduced simply by immersion in sodium thiosulphate solution, the action of which, if sufficiently prolonged, is to reduce the opacity to that of the original negative, the only difference then observable being in the colour. If a developer has been applied, this method is obviously inapplicable, and one of the usual reducers must be used.

*Keeping the Solutions.*—Mercuric iodide solution in soda sulphite, as in soda thiosulphate, keeps well in a weak light. Otherwise it deposits mercurous iodide and mercury, and soon loses its intensifying properties. This change has suggested an investigation of the action of light on mercurous iodide with sulphite or thiosulphate of soda, which we are now following up.

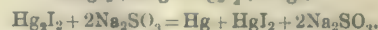
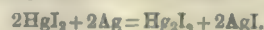
*Theory of the Intensification Process.*—The theory of the process is very probably similar to that which we have stated in the case of thiosulphate. Mercuric iodide is obtained in solution, owing to the formation of a double salt of mercuric iodide and sulphite of soda, answering, if we may reason by analogy, to the formula—



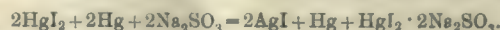
or possibly by double decomposition, and the formation of sodium iodide,  $\text{NaI}$ , and a double sulphite of mercury and sodium,



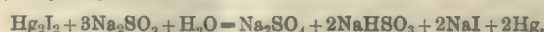
In either case the action of the solution on the silver image is to first form mercurous iodide and silver iodide, the former being afterwards decomposed into mercury and mercuric iodide—



It may be, as we have intimated in the section on thiosulphate, that the mercuric iodide arising from the decomposition of the mercurous iodide forms sodium iodide and double sulphite of mercury and sodium. It is extremely difficult to confirm by analytical processes the predominance of one or other of these reactions, but, for the reasons before stated, this latter reaction is more probable, and the reaction is probably—



It is imaginable that the sulphite of soda acts on the iodine of the mercurous iodide, producing bisulphite and sulphate of soda and metallic mercury as per equation—



but the ease with which mercuric iodide is isolated from the liquid, and the facts that the quantity of sulphate does not increase, nor the liquid become acid (as would be the case if acid sulphite were formed) are arguments the other way.

*Use of Different Solvents in the Mercuric Iodide Intensifier.*—We have employed several solvents of mercuric iodide, viz., potassium iodide, ammonium chloride, sodium and potassium chloride. These, although (with the exception of the two last named) giving just as great intensification as sulphite or thiosulphate, possess the disadvantage of leaving the film in such a state that, when it is at all thoroughly washed, a yellow to red precipitate is thrown down on it, which we take to be a mixture of mercuric and mercurous iodide. The formation of this precipitate is due, no doubt, to the instability of the double salts formed by mercuric iodide and alkaline chlorides or iodides. The reactions which take place when these solvents are used in place of sulphite or thiosulphate are, however, precisely analogous to those prevailing in the case of these latter.

The equations will be as we have already given, and we have obtained evidence of the formation, from a mercuric iodide, of soluble double salts by acting directly with these solvents on mercuric iodide. In every case it proved possible to isolate and clearly identify the mercuric iodide. It should be distinctly understood that in no case is it possible to employ for intensification a great excess of the solvents in relation to the mercuric iodide, for a proportion of alkaline iodide or chloride of about 8 parts per 100, affects the gelatine, and, besides, incurs the precipitation of yellowish-red precipitate when the plate is washed.

*Conclusions.*—To summarise: The solution of mercuric iodide in sulphite of soda is the best form in which mercuric iodide can be used as an intensifier, allowing direct and visible intensification. Although the intensified images, especially if treated in a bath of soda sulphite, possess a fair stability, it is indispensable, in order to secure an image which will not yellow in moist air, to treat the negative with a developer.

LUMIERE FRERES AND SEYEWETZ.

#### PHOTO-ENGRAVING PRICES.

THE natural sequence to the appearance of any new and apparently profitable industry in the arena of trade is a tendency to overcrowding from the influx of other new traders.

Now, these newer firms must have orders, and in order to gain custom they must either offer greater advantages to the customers of established photo-engravers or seek in some way to gain a totally new clientele. The former is the most likely course, and there are open the alternatives of (1) better blocks at the same price as the older firms; (2) quicker work at the same price; (3) cheaper work of the same quality; (4) cheaper work of inferior quality.

Unfortunately it appears that nearly every new firm of photo-engravers adopts the policy of No. 3, that is to say, they offer blocks, the best of which are about equal to the average turn-out of the first-class established firm, but at prices materially lower.

Now, it is clear that a method like this cannot go on indefinitely; though to judge by the grumbles about bad trade, and rumours of process firms having a hard fight to make ends meet, this kind of thing has gone too far already.

I have no reliable statistics to judge by, but there seems to be less of a boom in photo-engraving than there was about 1892, when the enameline process promised such great things, which have not all been fulfilled. It seems that things will really be better and healthier now that it is discovered that process work is not the El Dorado it was supposed to be when prices were arbitrarily fixed by the pioneers of photo-engraving.



Every dog has his day, and the inventors and earlier workers in "process" have made good use of their day. They have survived the enormous drop in prices represented by the difference between the "good-old-times" price of 2s. 6d. a square inch and the present average of 7½d. a square inch. And why? Because it is probably true that with ample capital, well-appointed plant, and modern methods, a firm can make more profit now at 9d. per square inch than could formerly be made at the princely price of 1s. 6d.

This is because our present-day methods are much more scientific and certain, unlike those of the days when, for half-tone, albumen and bitumen were supreme, and there existed but an imperfect knowledge of the principles governing the action of the ruled screen.

But, still, the danger is that average prices seem to be getting beneath the point which improved methods can counter-balance, and this undercutting, it is certain, must stop somewhere, or ruin must be the ultimate result.

Now, photo-engraving seems just the kind of trade to be held well together by an association like the electrotypers and stereotypers have for the upholding of prices. But it might be more successful apart from these other trades, and the many provincial process houses should not be left out in the cold as they are at present. Methods of pricing should be kept up to date, that is, not a rigid fixed minimum for all sizes of plates, but the newer and fairer method of graduating the square-inch price in proportion to the size of the plate. In spite of the would-be reformers the square-inch pricing seems the most convenient and most likely to survive.

After all, commercial success in process work seems to be most likely attained under the following conditions: Ample capital; capable management; conscientious operators; prompt delivery; a fair price for good work, or refusal to undertake it; and this motto, framed in your office or in your heart: "Tis better to play for nothing than to work for nothing."

HAROLD W. HOOD.

## HOW I DID NOT PHOTOGRAPH THE METEORS.

FOR weeks the Press—common five-eight and scientific, yea, even and photographic—had been dunning into the ears—or should it be flashing into the eyes?—of its readers the great visions of ethereal flashlights that were to be seen in the passage of the Leonides (any friends of the "Ides of March?") from somewhere about the Plough and Leo, and I think the Pole star had something to do with it, to somewhere, or, more probably, nowhere. Even the man in the street was interested in this meteoric display which visited us over thirty years ago. That is always the way, familiarity breeds contempt; but, because it was over thirty years since we had this display, every one must needs be as solicitous as if some rich and ready-to-die relative was coming to visit us from some far-away country, to which he had gone when mother was a child, and his visit was with the evident intention of appointing one of us his heir.

Well, well, we are undoubtedly an imitative race, and I had to do as the others did. I aroused a lively interest in the various sky-high constellations, and by earnest study direct from the upper regions I have gained—a crick in my neck. It is hard work, if you are rather round-shouldered, studying astronomy. My enthusiasm in this newly discovered firework science overran my usual discretion, and in an unguarded moment I not only resolved to photograph these said Leonides, but I informed some other enthusiasts of my intention. Now, my friends consider me a "class" photographer, my figure studies and landscapes are invariably praised with an "Isn't that like?" or some other complimentary remark, while my attempts at architectural photography have attained to the dignity of "pretty." Editors of photographic papers in their omniscience, and Judges of photographic exhibitions in their autocratic power, have evidently discovered in me a possible and dangerous rival, for they steadfastly decline to acknowledge my photographic power, at least publicly, though they are bound to recognise it in their heart of hearts—how does the plural or singular come in now in reference to the almighty editorial WE?

By making a series of meteoric photographs—no, that would be better-worded, photographs of meteors—scientific men would be glad to acknowledge my photographic ability—scientific men are so truthfully truthful.

After reading any instructions I could get on the subject, such as focus on a distant object, use fastest place, lens at open aperture, expose plate and trust to the meteors crossing your "line of fire," &c., I went on the fateful night to a neighbouring height, with my camera and a full stock of plates. It was one of these clear, cold nights, just such a one as a pedestrian would choose for a good smart walk, while overhead "pale Luna shed her silvery light." Several other inquirers after knowledge were there before me, but none of them had a camera. Consequently you can see that amongst that devoted band of embryo scientists I was a man of some importance. "Focus on a distant object"—I focussed on the moon, and after I had it so sharp in focus that I could almost see "the man," I decided it would do, and, with the assistance of some of the waiting astronomers, I pointed the one-eyed watcher towards that part of the heavens between the Plough and Leo, at least we believed it was thereabout, and that was where the pyrotechnical display was supposed to start. I did not uncup the lens, as there were no signs of

out-of-the-way life in the firmament, nothing but the silent twinkle of the stars, and over all the kindly light of the moon. It was cold waiting; we walked about, smoked hard, danced, sung, and did, in fact, anything to try to disperse that piercing cold, while outside our noisy circle the world lay peacefully sleeping. Still no signs of these boasted messengers of fire; by-and-by one by one of our little band slipped away to "Blanket Bay," and a despondency fell on those left behind. As it was nearing two a.m., only my next-door neighbour and I were left, and the heavens were still in a state of quiescence. Human flesh and blood, even when protected by monster overcoats, could stand it no longer, and we regretfully left for home, having seen no meteors.

We had not, however, given up hope, but determined to "call again" at an early hour; so, after about two hours troubled sleep, we again journeyed to a point of vantage, accompanied by the camera; and as it was getting towards morning, or rather dawning, we both took our dogs with us, so that they might also experience the benefits of "early to rise"—you can perceive from this we were not selfish.

There on the hill-top, in the cold, clear November morning, stood these devotees of duty—two men, two dogs, and one camera—but in spite of the enthusiasm displayed, and the very evident thirst for phenomena, that phenomenon absolutely refused to oblige. By-and-by the factories in the valley began to twinkle with many lights, betokening preparations for the work of the incoming day. The moon sank below the eastern horizon in a blaze of golden glory, strangely in contrast with her silvery magnificence at midnight. The stars one by one disappeared, until so few were left that they looked more like signal lights than parts of a vast illumination.

From the valley at our feet came up the hum—that musical indication of many workers, toiling for daily bread. In the east we now saw the first gleam of returning day, faint and indecisive at first, but gradually gaining in power. Still we shivered, still the meteors most inconspicuously absented themselves. Daylight was at hand when we sorrowfully descended from our watch-tower to work-a-day world.

The memory of that night and morning still bring a shiver through at least two peaceful citizens, and meteors are distinctly "off" in their estimations. These plates, which twice ascended the hill of difficulty, are as yet unexposed, and in all probability the faith of the writer will hardly stand the test of thirty years waiting for the next display of Leonides. His faith in astronomical prophets has sustained a severe shock, not wholly attributable to cold.

ALLAN BLAIR.

## Our Editorial Table.

### THE "THISTLE" P.O.P.

Manufactured by H. M. Macfarlane, 30, Ravenscourt-gardens, London, W.

It is a tribute to the popularity of gelatino-chloride printing, that, although the process has been before the public for a good many years, new brands are constantly being introduced. The latest sample to reach us bears the distinctive name of the "Thistle," and the manufacturer, Mr. Macfarlane, informs us that he has had it well tried by some of the most expert photographers, who have reported favourably of it. So far as we have been able to judge from the sample sent us, the "Thistle" P.O.P. has been very carefully prepared, and yields results quite comparable to those we have seen or produced on other gelatine papers—of which, indeed, we have used not a few. The instructions for working the "Thistle" P.O.P. are as follows: Printing should be a little darker than the finished print is required. Before toning, wash for ten minutes in several changes of water. Toning.—Any of the usual formulæ may be used, but the following is strongly recommended:—

Sulphocyanide of ammonium .....	36 grains.
Chloride of gold .....	2½ "
Distilled water .....	20 ounces.

Toning will be complete in about five minutes; then wash for a few minutes and transfer to fixing bath: Hypo, 3 ounces; water, 20 ounces. Fix for ten minutes, and thoroughly wash in running water or several changes. The paper is sent out at the usual prices.

Messrs. WELLINGTON & WARD, of Elstree, have been good enough to send us their Almanac and Date Card for 1900. This handy and artistic daily remembrancer has been designed by George Walton, which is equivalent to saying that it is effective and in the best of taste. The firm state that all dealers and professionals who have not received a copy can obtain one on application to them. The Wellington Almanac is distinctly worth having.

### THE BYNOE LIMELIGHT JET.

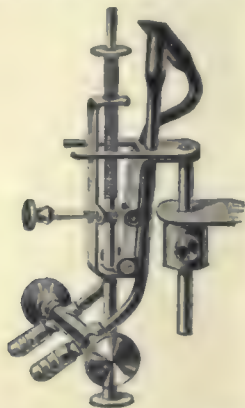
Manufactured by R. & J. Beck, Ltd., 68, Cornhill, E.C.

The characteristic features of this jet are given in the following description of it by Messrs. Beck. It is intended for use with their New Luvex Lantern, or any lantern with overhanging body, where it is desired to use the limelight instead of the incandescent gas light. It is pointed out



that this is very necessary when a large screen is used, or when a lantern is used for demonstration in a partially illuminated room.

Lanterns of the above type do not admit of the use of ordinary jets, as they project beyond the back of the lantern, and, besides illuminating the room, are liable to get moved out of centre with the slightest touch. In the Bynoe jet there are no cog wheels to get clogged, and the adjust-



ments are simple and cannot get out of order. Screw-down valves are fitted instead of ordinary stop cocks, so that the gas can be regulated with the most delicate precision, and when once right there is no chance of it being accidentally altered.

The Bynoe Jet can either be supplied as a blow-through or as a mixed jet. The prices are as follows: Blow-through jet, 15s.; mixed jet, 17s. 6d.; tray for fitting to Luvex Lantern, 2s.

#### THE SANDELL CRISTOID FILMS.

Manufactured by Sandell Plates and Films, Ltd., Norwood Junction, London, S.E.

DURING the past few weeks reference has more than once been made in our pages to the new Sandell film, which its inventor has termed "Cristoid," and on December 8 we gave a brief outline of the process of manufacture. Cristoid, in fine, is a hardened sensitive gelatine film unsupported by any base, such as glass or paper, and it may be employed either in the out form for use in dark slides, or as a rollable film for daylight cartridge work. It seems to us that in the latest phase of film photography Mr. Sandell comes before the world with an exceedingly happy idea that is likely to meet with great success.

A considerable number of negatives made on the new film have been placed before us. These ranged in size from 12 x 10 down to half-plate, and the films were exposed both in dark slides and roll-holders. We do not desire to see anything finer in the way of photographic negatives. The films were of about the same consistency as rollable celluloid; they were perfectly flat and free from any objectionable curl, presented a smooth, even surface, and, examined by transmitted light, revealed an image without flaw. With such evidence of the qualitative results yieldable by Cristoid, we are justified in expecting it to win great appreciation in practice.

With a hardened gelatine film as the sole "support" of the sensitive layer, certain physical advantages are obviously assured as compared with other negative processes, viz., lightness, flatness, non-inflammability, coating on both sides (Cristoid is slow on one surface and rapid on the other), absence of halation and frilling. We append the principal instructions for the manipulation of the films:—

The out films may be exposed in any ordinary slide of book pattern without a carrier, if backed with a black card or piece of ferrotype plate, but the most convenient method is with the metal carrier, having the hinged rebate. N.B.—The films should be held by the corners, and not placed on the hand, as the moisture and heat inclined them to buckle; they, however, quickly resume their flatness when put down.

#### FORMULÆ.

##### Stock Developer One Solution.

Pyro catechin .....	1 ounce	or	30 grammes.
Potassium bromide .....	30 grains	"	2 "
Sulphite soda .....	4 ounces	"	120 "
Caustic soda .....	1 ounce	"	15 "
Boiled or distilled water .....	1 pint	"	600 c.c.

Dissolve each ingredient in the water in order given.

For standard solution take one part of stock developer and dilute with seven parts water, at temperatures of 55° to 60°, six minutes will be sufficient time, at lower temperatures increase the time or strength of solution; when sufficient density is not obtained in above time, under-exposure is the cause.

#### Formalin Bath.

Formalin .....	2 ounces	or	60 c.c.
Bromide potassium .....	60 grains	"	4 grammes.
Water .....	to 1 pint	"	600 c.c.

#### Fixing Bath.

Hyposulphite soda .....	8 ounces.
Water .....	1 pint.

Place first the formalin bath in a suitable size dish, a deep one by preference, and one large enough to take the enlarged film. Into the bath place the films one by one, allowing each to be covered and softened before adding the next, in this way six quarter-plate films may be treated in a half-plate dish. After the last film is immersed, keep dish moving for three to four minutes at temperatures between 55° to 60°, then replace bath in its bottle, drain and pour on (for six films) about eight ounces of standard developing solution. Turn the films over once or twice and keep moving for six minutes as before mentioned, wash in three or four changes of water and transfer to the fixing bath. The latter may be contained in any convenient wide-mouthed vessel, jar or bottle, and should be shaken from time to time and warmed if cold.

Washing if effected in running water is accomplished in half an hour. Should it be desired to restore negatives to the original size of film, this is easily effected by using a bath of methylated spirit after washing, then squeezegeeing.

To dry negatives they must be laid out and squeezegeed on pieces of clean French-chalked and dusted glass or ferrotype plate and set up to dry in a cool but dry place; if placed in the sun or a warm place, curling from the support will probably be experienced, necessitating another wetting and laying down. When quite dry, the negatives are easily stripped.

N.B.—If, in squeezegeeing, the shape of the film is interfered with at sides or ends by undue pressure, the shape is readily restored by pressing against the defective side with a straight edge such as a flat rule.

If it be desired to varnish the negative, a clean glass plate should be first coated with Cristoid varnish; when the latter is dry, the film is laid down as on plain glass and dried. Before stripping, the varnish film, outside edge of negative, should be cut through. If, before cutting the varnish film, the negative be painted over with varnish by means of a brush, a perfectly waterproof negative is produced.

In printing, which may be from either side, use a printing frame having a glass plate; at the back of paper a sheet of thin card should be placed and then a pad of felt to equally distribute pressure. The printing frame must not be placed in the sun. Should an unvarnished negative be injured by moisture or handling, it can be put right by squeezegeeing.

During the holidays we submitted the new Cristoid film to practical trial, and were much pleased with the ease attending its manipulation and the excellent quality of the pellicular negatives the process is capable of yielding. By the large section of the public with whom rollable film photography is a *sine-quâ-non*, Cristoid film will undoubtedly be welcomed.

## News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday evening, January 3, 1900. Open Meeting.

ROYAL PHOTOGRAPHIC SOCIETY.—On Tuesday, January 2, 1900, at eight p.m. Mr. Henry Spayer will give a lecture entitled, "Round about the Matterhorn and Aletsch Glacier," illustrated by slides from his own photographs. Ladies are specially invited to the meeting.

RÖNTGEN SOCIETY.—At the Ordinary General Meeting, on Thursday, January 4, at 20, Hanover-square, a paper will be read by Mr. Chisholm Williams on "The Interpretation of Skiagrams." Future arrangements are as follows: February 1, Dr. Hugh Walsham, "Röntgen rays in Diseases of the Chest." March 1, Mr. J. H. Gardner, subject to be announced later. April 5, Dr. Norris Wolfenden and Dr. Forbes Ross, "The Influence of the X Rays upon the Growth and Development of Micro-organisms."

At a meeting of the Ealing Photographic Society, held on the 18th inst., Mr. A. Ernest Smith attended for the purpose of awarding the medal, offered by the Society, for the best print, either direct or enlarged, and by any process, made from a negative taken at one of the summer excursions to Denham, Virginia Water, and Burnham Beeches, all the work to be that of the competitors. Seventy prints were sent in, besides a few not for competition. The medal was awarded to Mr. G. Fryer for a half-plate carbon print, and the Judge mentioned that the second best print was a quarter-plate carbon print by Mr. S. Stewart.

THE NATIONAL PHOTOGRAPHIC AND ALLIED TRADES' EXHIBITION, 1900.—The following is a list of the firms who have already booked spaces for the above Exhibition, which is to be held next spring, from April 27 to May 5: Marion & Co., London; George Houghton & Son, London; Thornton-Pickard Manufacturing Company, Ltd., Altrincham; Butcher & Son, Blackheath; Joseph Levi & Co., London; Cameras Limited, Manchester; C. P. Goerz, Berlin; Morgan & Kidd, Richmond; J. F. Shaw & Co., London; Spratt Bros., Hackney; J. J. Griffin & Sons, Ltd., London; O. Sichel & Co., London; D. A. Lowthime, London; Lonsdale Bros., Hornsey; Benettink & Co., London; Tella Camera Company, London; William Tylar, Birmingham.



Warwick Trading Company, London; Levi, Jones, & Co., Ltd., London; J. Lizars, Glasgow; Dawbarn & Ward, Ltd., London; Camera Construction Company, London; Lumière et Fils, Lyons; Bessus & Co., London; H. W. Cox, London; Monroe Camera Company, London; Photo-chromosome Syndicate, Ltd., London; Secco Films, Ltd., London; Gaumont & Co., Paris; Wallis Bros., Kettering; Iliffe, Sons, & Sturmer, Ltd., London; A. C. Jackson, Hackney; Hepworth & Co., Walton-on-Thames; T. P. Bethell, Liverpool; Films Limited, Manchester; *The Photogram*, London; *Photography*, Coventry; *The Photographic Dealer*, London; Process and Engineering Company, London; H. Purser, London; Moulton Bros., London; Mutoscope Syndicate, Ltd., London; J. E. Lockyer, Deptford; Rathenow Optical Company, Rathenow.

## Patent News.

THE following applications for Patents were made between December 11 and December 16, 1899:—

**DARK SLIDES.**—No. 24,692. "Improvement in Photographic Film-holders (dark slides)." J. R. GORTZ.

**CINEMATOGRAPHY.**—No. 24,726. "Means for Regulating the Speed of the Positive Film whilst in motion in Cinematographs and like apparatus for Optical Projection." E. J. MAREY.

**DIPPERS.**—No. 24,744. "A new or improved Device for Dipping and Holding Photographs in the Developing Bath." T. E. C. WILSON.

**LENSES.**—No. 24,720. "Improvements relating to Photographic Lenses." Complete specification. T. R. DALLMEYER.

**APPARATUS.**—No. 24,884. "Improvements in Apparatus for taking Photographs." F. DE P. ROMANI.

**APPARATUS.**—No. 24,896. "Improvements in or relating to Apparatus for Taking and Exposing Photographic Pictures." Communicated by P. A. J. GASSA. A. J. BOULT.

**ACETYLENE.**—No. 24,963. "The Application of Acetylene Gaslight for Photographic Printing and Lithographic Printing, and the like." M. JACKSON AND A. J. C. JACKSON.

## Meetings of Societies.

### MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
1.....	Cripplegate Photo. Society .....	Lantern Night.
1.....	South London .....	Winchester Excursion. J. T. French.
1.....	Stafford Photo. Society.....	Technical Control for Pictorial Results. Reader, H. E. Burn.
2.....	Bristol and West of England ..	Elementary Technical Instruction Meeting. ing: <i>The Negative</i> . E. Brightman.
2.....	Gospel Oak .....	Social and Exhibition of Members' Work.
2.....	Hackney .....	Members' Lantern Evening.
2.....	Isle of Thane .....	Social Evening.
2.....	Redhill and District .....	Negative-making. F. Martin Duncan.
2.....	Royal Photographic Society ..	Round about the Mottelhorn and the Alps. Glacier. Henry Speyer.
3.....	Ashton-under-Lyne .....	Sale of Illustrated Papers and Magazines.
3.....	Borough Polytechnic .....	Country Life. R. R. Hawkins.
3.....	Croydon Camera Club .....	The Preparation of Negatives for Printing. ing. Francis T. Beeson, F.R.P.S.
3.....	Photographic Club .....	Open Meeting.
3.....	Southsea .....	Toning Processes. F. J. Mortimer.
3.....	Woodford .....	Horse Lens is Made. C. P. Goetz.
4.....	Camera Club .....	John Chinaman as seen by John Bull. Rev. Hugh M. Eytton-Jones, M.A.
4.....	Darwen .....	Lecture: <i>Negative-making</i> .
4.....	Leeds Photo. Society .....	The Camera as an Aid to the Study of a River. H. Crowther, F.R.M.S.
4.....	Tunbridge Wells .....	South African Slides, lent by the Union Steamship Company.
5.....	Borough Polytechnic .....	Practical Evening: <i>Modification of Lenses</i> .
5.....	West London .....	Demonstration: Carbon. J. Brown.

### LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 21.—Mr. T. E. Freshwater in the chair.

The CHAIRMAN laid before the meeting a form prepared by the Photographic Copyright Union, protesting against the proposed new Copyright Act, by which photography is deprived of its old status as one of the fine arts, under the existing Act (1862), which it is proposed to supersede. The Copyright Union requested the support of this Association in opposing Lord Monckswell's new Act now before the Lords. Under the new Bill copyright is only called into being by the registration of a photograph, and, if this is not done within six months, all right to protection is entirely lost.

Mr. PHILIP EVERITT said that, on the other side, it was not fair that a man who deferred the protection of his work by registration until the picture became of value should have protection on the same terms as if registered at the proper time set forth in the new Act. The existing Act was one-sided, and required amendment in many particulars.

Several speakers took exception to the views of the last speaker, and instances in illustration and support of either side were given at length.

The Chairman's signature to the document was duly authorised by the meeting.

Mr. MACKIE referred to Lumière's iodide of mercury and anhydrous sodium

sulphite intensifier, which was analogous to Edwards's intensifier, although the latter employed hyposulphite of soda in place of the sulphite of Lumière's formula. The advantage of the new formula was that the negative treated would not so quickly change as did those intensified by Edwards's method, and any chance of this could be quite eliminated by subsequent redevelopment, which left the image in a permanent form. Mr. Mackie had bought a bottle of the intensifier, one ounce for 1s., but he found it stated that, by purchasing the separate salts, eleven ounces of the mixture could be acquired for about 3s.

A discussion took place regarding new and old developers, and it was said that, while pyrogallol could not perhaps be beaten in its results, ortol was very near its equal. The advantage of the latter was that there was no staining of the fingers or plate, and several plates could be developed without renewing the solution. Ortol is three times the price of pyro, and, if by the former six plates could be developed, it resulted in ortol being half the ultimate cost of pyro.

Mr. EVERITT called attention to the fact that R. E. Liesegang had stated that stale pyro developer diminished the evils of over-exposure. He used a solution that had been employed six times before, and found that the negative was far better than it would otherwise have been. Bromide would only have retarded the development, but the stale pyro corrected the excessive exposure.

### PHOTOGRAPHIC CLUB.

DECEMBER 20.—Mr. J. R. Williams in the chair.

The HON. SECRETARY laid before the meeting a document submitted by the Photographic Copyright Union, protesting against the new Artistic Copyright Bill which is before the House of Lords. The new Act would expel photography from the fine arts, amongst which it has been classed since the Act of 1862, and place it altogether in a debased position. It was unanimously decided to support the protest set on foot by the Union, and the Chairman's and Secretary's signatures were duly appended to the document.

The HON. SECRETARY read the Affiliation Lecture,

CHEMISTRY AS IT CONCERNS PHOTOGRAPHERS,

by Mr. C. F. TOWNSEND. After commenting upon the extent to which theories advanced for the explanation of natural phenomena have been of service in laying bare the secret workings of nature, the author proceeds to inquire into them as applied to bodies such as water, air, and other familiar surroundings. Directions for experimental proof of theories are given, and considerable attention is given to the metal silver which plays so important a part in photographic practice. The effect of light, reducing agents, and solvents of its salts upon the various forms it takes, were explained in an elementary and instructive manner, which was fully appreciated by the meeting.

**Croydon Camera Club.**—The Christmas-card competition, which was entered into with some spirit by a section of the members, ended in the medal being awarded to Mr. Ben. E. Edwards, with a clever set of snow and ice scenes arranged upon a suitable card. At the request of the Council, Mr. EDWARDS gave an interesting lantern lecture on Wednesday, the 20th inst., explaining his procedure in the exposure of lantern slides. A large number of examples, exposed and developed under different conditions, were shown on the screen, the main deduction being that, given a sufficient exposure, four or even eight times the normal might be employed without serious harm, resulting providing development were stopped early enough. The plates used were Thomas's, to which the above remarks apply. A number of slides by the following members were shown, some of which will be included in the lantern entertainment at the Public Hall on the 17th prox.: Messrs. Rogers (eclipse studies), Andrews (camp life), Myrtle, Kough (snow scenery), Edwards, Watson (Gloucestershire scenery), Maclean (military on the march). Amongst those shown by the last-named was a slide from a plate exposed in June 1897. It was not developed until two years and a half after exposure, and, although the plate was an extremely sensitive one, the negative turned out quite satisfactory, as evidenced by a very brilliant lantern slide. The negative referred to was taken on an Imperial flashlight plate.

**Richmond Camera Club.**—At the meeting on the 18th inst. a paper by Mr. J. A. Hodges was read, in which the pictorial treatment of lantern slides was dealt with. Mr. Hodges advocated the use of a piece of very finely ground glass or matt celluloid, which should be fixed on the back of the negative, and on which, by means of finely powdered plumbago, the parts that printed too deeply could be strengthened. A collection of slides, showing negatives before and after treatment and the resulting lantern slides, accompanied the paper, and in many cases proved the correctness of Mr. Hodges' statements.

### FORTHCOMING EXHIBITIONS.

1899.	
Dec. 29, 30 .....	Borough Polytechnic Photographic Society. Hon. Exhibition Secretary, E. J. Hoar, 59, Hillingdon-street, S.E.
.. 29-Jan. 1900 ...	Huddersfield (Invitation). W. A. Beevers. Cloth Hall-street, Huddersfield.
1900.	
January 29-31.....	Southsea Amateur Photographic Society. F. J. Mortimer, 10, Ordnance-row, Portsea.
February 10-21 .....	Edinburgh Photographic Society. J. S. McCulloch, 10A, George-street, Edinburgh.
March .....	South London Photographic Society.



April 3-7 ..... Birkenhead International. C. F. Inston, 25, South John-street, Liverpool.

Those who desire to send photographs to the above Exhibitions should write for prospectuses to the Hon. Secretaries, whose addresses are given in the second column above. The dates mentioned are those at which the Exhibitions open.

## Correspondence.

\* \* Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

\* \* We do not undertake responsibility for the opinions expressed by our correspondents.

### THE METRIC SYSTEM.

To the Editors.

GENTLEMEN,—I am glad to see the BRITISH JOURNAL OF PHOTOGRAPHY joining in the attempt to further the use of the decimal system as applied to weights and measures. Apart from the more scientific aspect of the question is, perhaps, the much greater facility it gives for the calculation of quantities, and it has always being a matter of surprise to me why educated men, like photographers and pharmacists, should so long have hesitated to adopt it, and even now I fear the majority still adhere to the old and irrational system.

On casting about for a reason why this should be so, I have come to the conclusion that it is on all fours with what occurs when an Englishman tries to learn (say) French; instead of learning that language as French, he instinctively turns it first into English, before he can make any thing of it, which is, of course, absurd. It would be just as reasonable when reading an English book to attempt to get at its meaning by turning it into French, or *vice versa*. There are many expressions and phrases in both languages that it is not possible to translate literally.

In like manner, when a man who is used to the old system of weights and measures wants to adopt the new metric system, what does he do? He says: Oh, a gramme is 15.432 grains, and he takes out his grain weights accordingly; or, if a cubic centimetre, he says: Ah, that equals the weight of a gramme, and corresponds to about 17 minims, and out comes his minim measure. But then he cannot be quite exact, because, just as certain idioms in French have no exact counterpart in English, so the decimal points in the two systems come in as a disturbing factor.

It is very common now, both in pharmaceutical and photographic literature, to employ both the systems, and, if only the followers of either pursuit would get a set of metrical weights and measures, and use them as such at every available opportunity, more than half the battle would be overcome; and, if the authors of formulae would only express them according to the metric system, instead of the utterly absurd proportions now given, the other half of the difficulty would disappear. Captain Abney has set a good example in his *Instruction in Photography*.—I am, yours, &c. J. H. BALDOCK, F.C.S.

### DOES BACKING SLOW A PLATE?

To the Editors.

GENTLEMEN,—Re your report of meeting of Photographic Club. It appears to me it would have been better to have named the subject of "Plate Backing" at the time of the lecture. And how does the Chairman know that a "many people," &c.? I suppose I reminded him of the many people. I may inform him that my conclusions were drawn from practical experience had under "decent conditions." I should have been glad if my slides, which I had prepared specially for the occasion, had been shown under "decent conditions," instead of the wretched rag used for a screen. My slides were spotless. An artist present offered to touch them up and spot them for me before I showed them again; the faults, of course, were in the sheet. Much time was wasted in reading minutes, &c., which not a soul listened to, and then discussion was invited—time wasted, which might have been devoted to rearranging the screen. I think my name had better have been left out of the report of the meeting. The Chairman, I am aware, is very learned, but I prefer experience to theory.—I am, yours, &c.,

9, Baker-street, Portman-square, W.

THOMAS FALL.

### ORTOL.

To the Editors.

GENTLEMEN,—Mr. Welford's articles on ortol seem to have produced some controversy as to its value as a developer; it appears to me that the question is one of economy over pyro, but at what cost? the falling off in quality if used repeatedly. Each plate developed induces additional restrainer, and needs increased time in development; these disadvantages are detrimental to uniform results. I have experimented with all the various developers, and, in comparison with

our old friend pyro, prefer its use. I consider it cheaper in the end, by securing uniform results with a uniform developer. You speak of temperature as an important factor in satisfactory results; in cold weather I always make this a great consideration, and generally start at 70; but finding that after completion of development the temperature is reduced to 60°, to prevent this, I warm the dish and retain the same temperature throughout.

Mem.—I find that after using ortol it has a peculiar effect on my skin for days when I use soap, similar to washing in very hard water.—I am, yours, &c., PYRO.

## Answers to Correspondents.

\* \* All matters intended for the text portion of this JOURNAL, including queries, must be addressed to "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 24, Wellington-street, Strand, London, W.C. Inattention to this ensures delay.

\* \* Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.

\* \* Communications relating to Advertisements and general business affairs should be addressed to Messrs. HENRY GREENWOOD & Co., 24, Wellington-street, Strand, London, W.C.

S. W. MARCHANT.—Many thanks for the correction, which shall be duly noted.

FLASHLIGHT.—J. OSMAN. The compound, according to the formula enclosed, will give a very brilliant light, which is very actinic and well suited to your purpose, but we give you a word of caution: The mixture is a very dangerous one to deal with. Its components are harmless enough by themselves, but when mixed together the case is just the reverse. Dry and powder the ingredients separately, and mix them together in small quantities as required for use on a sheet of paper, using a piece of cardboard as a spatula.

STUDIO DESIGN.—BEGINNER writes: "I propose building a studio in my garden in the spring against the side south wall of the house, so that the only light I shall get will be from the direct north. I enclose three rough sketches (please excuse their roughness, but I think they, with the proposed dimensions, will give the idea) of what I propose. What I should like your opinion on is, which of the three would be the best?"—Decide upon "B," but do not carry the glass up to the top. Make the upper two feet six opaque, and you will have an excellent studio.

FRAUDULENT COPYRIGHT MARKING.—N. B. writes: "A photographer here is in the habit of marking the portraits he takes of his sitters in the ordinary course of business, and for which he has been paid, 'copyright.' I happen to know that he does not register them at Stationers' Hall. If he did, I doubt if the copyright would be good. What I want to know is whether he can legally mark a photograph copyright when there is no copyright in it?"—Certainly not. It is illegal to do so, and is a fraud as much so as to stamp anything "patent" when it is not patent, the penalty for which is very heavy.

A QUESTION OF DEFINITION.—R. J. says: "We enclose you a rough proof of gasometers recently taken by us for a firm in the north. They refuse to accept the picture, saying it is out of focus. We say it is sharp as a needle from end to end. They reply, 'The picture can be as sharp as a needle from end to end, and still be out of focus.' Will you oblige us by giving your valuable opinion on the subject in your paper, as we fail to see how such a thing is possible."—In reply: We quite agree with your customers that the photograph is out of focus, otherwise the lens gives very imperfect definition. You say the picture is "as sharp as a needle from end to end," whereas it is not sharply defined anywhere. We should say that you ought to supply a picture with finer detail for the purpose they, doubtless, require it for.

DISPUTED ACCOUNT.—Z. A. says: "A lady and her daughter sat for their portraits, a dozen cabinets each. I sent them each two proofs (good portraits); they did not like them. They were retaken, and still not liked. They both sat four times, and one five, before they were pleased. When I sent in the account for a dozen cabinets each at my usual charge, they disputed payment unless I made a considerable reduction, as it put them to inconvenience to sit so many times. On my saying that, if the amount was not paid, I should be compelled to proceed in the County Court, they said they should plead a set-off for their trouble. What is your advice?"—Proceed, decidedly, and you will recover. Produce proofs of the rejected portraits, and it will show the futility of the sitters and the trouble you went to to please them. We never heard of a case of this sort before.

STEREOSCOPIC PHOTOGRAPHY.—B. HOLMES writes: "On reading your excellent and comprehensive article on 'Stereoscopic Photography' in the ALMANAC for 1900, I see you mention a particular stereoscope for transparency workers, viz., fig. 4, page 670. I would esteem it a great favour if you would inform me if this sort of stereoscope is on the market, or if I could get one made at any particular firm, or any hints regarding it. I am very much interested in stereo-photography, having been working at it for a couple of years now, both in paper and transparencies, and admire it more than any other photographic process."—In reply: The instrument referred to was devised many years ago by Sir Howard Grubb. So far as we know, it is not obtainable commercially. We wish we could be instrumental in persuading apparatus-makers to take up the manufacture of many of the older forms of stereoscopes.



## MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."

[January 6, 1899.]

# THE LANTERN RECORD.

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### LANTERN MEMS.

GREETINGS to all lanternists and readers of these "Mems." for a healthful and happy New Year. It is usual, at the beginning of the year, to reflect on the past and make resolutions for the future. How many of us are satisfied, I wonder, with the retrospect? So many ideas conceived and not put into practice, experiments started and not completed, and improvements projected without being carried to a successful termination. However, with all these shortcomings, no doubt a fair proportion of good and practical work has been done, and the end of the year has found us better informed, more advanced, and in possession of improvements in apparatus and methods of working that will be useful in 1899.

To look back over a period of thirty years does not seem so very long, and yet this is the time I have been connected with lantern matters and optics; but to look forward one year is such an uncertain quantity that one has misgivings and doubts about seeing it through. If the world is not moving any faster than it used to years ago, certainly the people on it are, and, if the race is to the swift, we shall all have to be provided with auto-motors to keep pace with the developments that are occurring in all branches of science. The more one knows, the greater one feels one's comparative ignorance and the necessity to be up and doing. I often envy youth, with its boldness, and assurance, and satisfied airs, for they think there is no necessity to reflect, and are perfectly content with what is, without worrying about what will be. The "rude awakening," however, comes to all, except, perhaps, the self-conceited, and even they, by sheer rebuffs or experience of the world, are obliged to acknowledge, to themselves if not to others, that there is something that they might still learn with advantage to themselves.

HARKING back to the time I first had to do with optical lanterns, one can by comparison see the enormous advances made in their construction and the development of accessory apparatus, also the remarkable influx of traders into the industry. This, no doubt, is largely due to the popularity of photography as a pastime, and the facility with which lantern slides can be produced from one's own negatives; also the interest taken in all matters of travel and the desire of those who have visited "fresh fields and pastures new" to impart knowledge respecting same to others by exhibiting views of

the natural features of the country, buildings, and the people. To do this a lantern is necessary, and now hundreds trade in lanterns where only a few did in the sixties.

THE cinematograph, notwithstanding the restrictions imposed by the London County Council, is still very much to the fore, and recently I had an opportunity of witnessing the working of the "one-turn-one-picture" cinematograph. Certainly, as far as the mechanism was concerned, it left nothing to be desired, for a more clever application of sound movements and mechanical principles could hardly be conceived. In the result, it is possible to show a series of animated pictures as usual, and stop at any particular place and instantly reverse, the gearing being perfectly automatic, the simple act of turning the handle controlling it all, for on turning the reverse way, the ordinary gear goes out of action and the reversing movement comes into play. Pictures, such as soldiers marching, men diving, &c., are particularly suitable for this machine, for a dead stop or reversal can be instantly made.

BESIDES this important mechanical action, the machine has spools for the films large enough to take a number of subjects connected together, and can be enclosed in a metal case as now required when shown in public halls. It also has a fireproof safety fitting, so that it is not possible, even if the heat rays from the light are concentrated on the film, for more than one small circle in one picture to fire, and this at once goes out when the metal screen or support is reached. The intermittent action is also very good, and gives the least possible strain on the film, ensuring steadiness and certainty of movement. Altogether it is a high-class and practical machine.

ANOTHER novelty recently put on the market is the Birtac, a miniature machine for taking and projecting animated photographs, and, from what I saw at a special demonstration recently given by Mr. Birt Acres, there should be a good future before this *bijou* apparatus. Certainly the films shown were wonderfully steady. As the sensitive films used in taking the pictures are very inexpensive, subjects should be obtainable in a good light that will be enjoyed by the family circle afterwards. The light used for the projection apparatus, which forms part of the outfit, is incandescent gas, with a special small-size mantle. Of course, with this light, only a small disc can be obtained, but it is large enough for home use in a properly darkened room. As the whole apparatus, including camera, with good lens and daylight changing film-holders, lantern projector, and printing and developing apparatus, can be purchased for twelve guineas complete, it should be popular.

THERE is one thing of very marked interest to those who use, or desire to use, cinematographs, and that is the safety in use of this little apparatus, for, with the incandescent light, the heat rays are



not sufficiently great, nor do they come to a focus on the film, to fire it, and the films are on spools enclosed in covers. The whole is very portable, and requires very little technical knowledge to use it.

DR. GEORGE STOKER has for some years been experimenting in the healing of old ulcers and other forms of wounds, which are very tedious in the matter of repair, and very "callous" as regards any tendency to heal at all, by means of surrounding the part with an atmosphere of oxygen gas. His success has been undoubted, and he has contributed to medical science a valuable aid in a department of practice singularly disappointing, as a rule, to the surgeon. Dr. Stoker's latest account of his labour indicates that he regards this action of the oxygen, as directed, to form an antitoxin, or corrective principle, from the germs which are present in the non-healing part. He has proved this, scientifically, by passing oxygen through a culture of the germs, and by using the culture as an application of the wound. In this case healing proceeded as when oxygen was used directly. A great future should lie before this mode of encouraging the healing process. Dr. Stoker originally got this idea of the treatment from his experiences among savage tribes, which expose their wounds freely to the pure, germless air of their native hills.

As the Hungarian Patent Office does not publish any official gazette containing a record of the patents issued in that country, a journal has recently been established with a view to supplying this want. This journal is printed in four languages—Hungarian, German, French, and English. Some of the English descriptions are unique. We give below a specimen of the translations:—"PROCEEDING AT THE PRODUCTION OF STOCKINGS OF THE LIGHT WITHOUT FLAME OF SPONTANEOUS IGNITION.—*Claim*: Proceeding at the production of stockings of the light without flame of spontaneous ignition without use of heaters or putting-in of lighters, characterised by a stocking of light without flame of a provenience whatever prepared in such a manner after it's treatement in an alkalie bath by impregnation of one portion of its surface by platina—or iridium—salts, that these salts form ethiops of platina or iridium or the oxydes of incandescence—oxyde of thorium or cerium, &c.—causing the ignition of the stocking at the contact with the mixture of gas and air."

THE Elliott Cresson medal has been awarded to C. Francis Jenkins, for the invention of the phantascope, on the recommendation of the Franklin Institute, after a searching examination of this instrument.  
G. R. BAKER.

#### THE DETERMINATION OF WAVE-LENGTHS.

At the present moment, when so much attention is being directed to colour photography, it may not be out of place to summarise an extremely useful paper by Messrs. Edser & Butler on the above subject.

The determination of the wave-length of any particular spectrum line, or the absorption of any solution or glass to anything like accuracy, is by no means an easy task for those who have not some experience with the spectroscope and the various methods of calibrating the same.

I need hardly point out that there are two principal methods of determining wave-lengths—the one due to the reference to what I may call a chart in which the position of certain lines is, absolutely known, the said chart being projected simultaneously upon the sensitive surface whether this be the retina or the photographic plate; the other method is to employ graphic interpolation by means of a curve, and this is the more accurate the greater the number of Fraunhofer lines which are primarily determined.

When one considers that, although the number and relative positions of the spectrum lines of any substance are always absolutely the same under given conditions, yet that the apparent position of the same varies with the slightest change in the adjustment of the spectroscope, and, speaking broadly, is never the same for any two spectroscopes, no excuse is required for bringing forward the work of the above-named experimenters, and it is to be hoped that some one will shortly place in its complete form their extremely simple idea upon the market.

Taking advantage of the production of interference bands by a film of air between two silvered glass plates placed in front of the slit, they

obtain a scale which may be photographed once for all and kept for future reference, or else the scale may be photographed or used each time.

Their exact method of procedure is to obtain two pieces of good plate glass, and their surfaces should be silvered somewhat heavily by the milk-sugar process. The silvered surfaces are placed together, a little soft wax being placed at the edges to allow of the distance being adjusted, which is done by viewing a spot of light or incandescent electric lamp filament through the silvered surfaces, and pressure applied to the edges till the multiple images coincide. Then, on viewing a sodium flame through them, interference bands will be seen, and the glasses should be adjusted till they are as broad as possible, and they should be viewed at as great a distance as possible, as the perfection of the final results depends to a great extent on this adjustment.

The plates are placed in front of the slit of the spectroscope, and preferably with the slit parallel to the bands, when the spectrum will be seen to consist of bright lines separated by almost black bands. The authors state that using the arc light rendered slightly convergent by a lens as close as possible they proceed as follows for photographic purposes: "We have adopted the plan of covering either the upper or lower half of the slit with a piece of black paper stuck on with soft red wax before placing the plate in position. The necessary exposure will vary from about half a minute to three seconds (using Edwards's snapshot isochromatic plates), according to the nature of the spectrometer employed. It is well to introduce a little common salt into the arc while this exposure is being made, as thus the D lines, as well as the H and K lines, will be superimposed on the bands. Another piece of black paper having been placed so as just to cover the exposed half of the slit, the first piece is removed, and the spectrum which it is wished to examine is photographed."

Every fifth or tenth band can be marked starting from the red end and the whole numbered, and, this being done, the following is the method of determining the wave-lengths, using the D and H or K lines as the data. The equation used is—

$$n = \frac{m\lambda_n}{\lambda_0 - \lambda_m}$$

Scale No. 90.2

Wave-length, 5328.5 ( $\lambda_n$ )

" " 402.3

" " 3908.6 ( $\lambda_m$ )—

then  $m = 402.3 - 90.2 = 312.1$

$$\lambda_0 - \lambda_m = 1359.9$$

hence

$$n = 910.8$$

To find the wave-length of the line whose scale number = 371.2

$$\lambda = 371.2 - 90.2 = 281$$

then

$$\lambda r = \frac{n\lambda_0}{n+r} = \frac{910.8 \times 5328.5}{910.8 + 281} = 4072.2$$

Using this method it is possible to determine with the aid of an ordinary pocket magnifier the position of any given line to within one-tenth of an interference band, and from a table given by the authors it is possible to determine the wave-length to within an error of plus or minus 0.5 tenth-metres.

When a large number of wave-lengths have to be determined, a graphical method may be employed on divided paper, by plotting the frequencies vertically and horizontally; mark off the scale divisions vertically, starting from zero along the horizontal axis, and to mark off vertically above their respective scale divisions the frequencies of the two standard lines, joining the extremities of the latter by a straight line, and the frequency of any scale number is read off directly. The accuracy of this method is equal to the former.

If the reference interference scale is once photographed, it is unnecessary to do this with every spectrum, provided the adjustments of the spectrometer are not altered and the D lines are present in every photograph. The photographic scale is then placed with its film in contact with that of the photograph bearing the unknown spectrum, and, the D lines being brought into coincidence, the procedure above described is gone through.

A. D. PRETZL.

#### SOME NOTES ON STEREOSCOPIC SIZES.

It certainly seems to me a curious coincidence that during the last few weeks the subject of my article in the ALMANAC, i.e. stereo cameras and plates, has also been brought forward in these pages. Formerly I considered the subject a buried one; that was my reason for calling attention to it, and I am pleased to find that others besides myself consider the subject worthy of discussion; it clearly proves that the interest in stereoscopic matters is slowly but surely reviving.



I am not one of the old school, and cannot write of what I used forty years ago; historical matters, then, I will lay aside, and look at things of to-day. We have at least three sizes being used for stereoscopic work, viz.,  $6\frac{1}{2} \times 3\frac{1}{2}$ , half plate, and double quarter. It is also interesting to note that in France they also have three sizes, viz.,  $9 \times 18$ ,  $13 \times 18$ , and  $15 \times 21$  centimetres, in every-day use, and on two occasions I met with the  $12 \times 16\frac{1}{2}$  cm. being used for binocular work.

A few notes after two years' continuous working with one or other of the six sizes may be of interest to those who contemplate taking up this interesting branch of work. During my recent trip to the East I used two sizes only, both of which were French— $9 \times 18$  and  $13 \times 18$  centimetres, but for my own private work I favour the English "double-quarter," for reasons set forth in the ALMANAC.

The size I dislike most of all, and shall never use again, is the  $9 \times 18$  cm. ( $3.7 \times 7.0$  inches), which is nearly the same as our recognised stereo size,  $6\frac{1}{2} \times 3\frac{1}{2}$ . It may be gathered from this that I consider our "stereo" plate unsuitable, and for the simple reason that it allows of scarcely any trimming. Over and over again our artistic authorities tell us that pictures should be taken on plates large enough to allow of ample trimming. Does not the same rule apply to stereo and lantern slides, or are only those productions considered pictures that are fuzzy, foggy, and enlarged, or printed in mud—I mean gum?

I read in these pages a few weeks ago that some one advocated a stereo hand camera of the size mentioned, and also wondered very much why they were not more generally used, especially as half of a stereo slide was lantern size. Just so, but is it wise to take a lantern slide (or the negative) exactly the size a finished slide is to be? I should say not. It may be argued that masks serve the purpose of trimming. They may do to a certain degree; that, however, is not sufficient. Stereo pictures vary little, and masking, generally speaking, is not possible, hence the advisability of having a larger negative from which to select the choicest part for the stereo card.

What is the size of a stereo print? some may ask; and on looking through my collection I find I have four different makes—first, a French make,  $2\frac{1}{2}$  in. square; second, an American make,  $3\frac{1}{4} \times 3\frac{3}{4}$  in.; third, an English make (private),  $3 \times 4$  in.; and, lastly, some of a well-known English maker, who sticks to no regulation size but varies them. One of his slides is  $3\frac{1}{2}$  in. square, another only  $2\frac{1}{2}$  in., whilst some cards contain one of each, the right side being, as a rule, the largest.

Successful hand-camera work is at all times difficult, and that of stereo hand-cameras specially so. I do not say good results are not sometimes obtainable, because they are; but the utter failures are in a large majority, and, in the hands of a beginner, such would at once condemn stereoscopic work. The artistic and stereo qualities of the picture, be it remembered, are made or ruined in a small compass upon the finder, there being no  $12 \times 10$  plate to cut the square from. Hence the great care necessary.

The other size I used in the East ( $13 \times 8$  cm.) is very good indeed, and allows of ample trimming; but, as I have intimated elsewhere, of all the sizes now upon the market I prefer "double quarter."

RICHARD PENLAKE.

## SOME RECENT EXPERIMENTS IN FLASHLIGHT WORKING.

### II.

DURING recent years there has been a distinct tendency to employ flashing compounds prepared by mixing in varying proportions pure magnesium with gunpowder, also pure magnesium with chlorate of potash, as well as mixing sulphur with magnesium powder; and, considering the highly dangerous nature of these mixtures, it is surprising that such a procedure should be persisted in, especially when it has been conclusively proved that in pure magnesium alone lies all that is required for the successful accomplishment of flashlight working.

The mixing of one or other of the above ingredients with pure magnesium is, no doubt, prompted by a desire to consume all the magnesium powder, as well as to cause as brilliant a flash as possible in the briefest possible space of time. In the case of using gunpowder, for instance, any one who for the first time tries a mixture of such with pure magnesium will be forcibly impressed by the sudden nature of the combustion that takes place in comparison with what would be obtained by burning the same quantity of pure magnesium in a gas flame, or a flame emitted from the combustion of methylated spirits, the duration of the flash being not more than about one-third of the time occupied when the gunpowder is used in combination with magnesium.

This rapidity in combustion has been looked upon by some workers as a matter of importance when the light has been employed for the purposes of portraiture; but, when all is considered, there would appear to be very little, if indeed any, advantage when the very brief space of time required for pure magnesium being consumed is fully estimated. At least, in the writer's experience of using the flashlight in a pretty wide range of portraiture, there never was any difficulty experienced in not obtaining a sufficiently rapid flash of light; whilst in numerous other branches of photography the aim has always been in quite the opposite direction, i.e., to obtain a flash of the longest possible duration.

There have been certain forms of apparatus, however, constructed and

placed upon the market which, being specially designed to burn these compound mixtures, no doubt have led up to the practice of such being employed, even when a perfect knowledge of the danger attending such was well understood, and, every now and again, accidents which are clearly traceable to the employment of these dangerous mixtures are reported, the latest being of an alarming nature which took place in the South of England a few weeks ago.

Accidents have also happened through the admixture of sulphur and pure magnesium—a very striking instance of which occurred during a demonstration given before one of the photographic societies in the West of Scotland, and of which it is safe to state that not one individual who had the misfortune of being present on the occasion would ever dream of using such a mixture in future. The use of sulphur in conjunction with magnesium powder produces a light of extraordinary brilliancy, and, no doubt, enables every particle of the mixture being utilised in the flash, and, were the same free from the danger of exploding, would prove a most valuable compound to use in some instances of flashlight working, as may be proved by any one mixing a small quantity of such in a tin patty pan, say in the proportions of three parts of magnesium to two parts of flowers of sulphur, or thereabouts, firing the same by means of a lighted taper, or dropping a lighted fusee into it. This gives a flash of great actinic value in photography, and is somewhat slow in burning. It is, however, not a compound that can be manipulated with impunity, and should only be used when every possible precaution is taken to guard against accidents, and under no conditions should it be used in closed chambers of flash lamps.

If a compound of sulphur and pure magnesium has to be employed in such cases as dark interiors, where it is desired to light up a considerable area or space, proper provision should be made for burning the same in open vessels, such as cast-iron pans, placed in suitable position to each other, and firing the same by means of a lighted fusee attached to a long stick. Of course, a mixture of this kind is much more economical than pure magnesium alone, and the light is very good indeed.

With some operators working on wide subjects, no matter what form of lamp or light is being employed, there has always been a difficulty experienced where more than one lamp or light is concerned in getting all the lamps to fire simultaneously; this is, no doubt, a matter of considerable importance where moving objects are concerned; but of little moment where fixed interiors are being dealt with, and where in many instances an operator can walk from place to place giving a flash at will, taking care, of course, to keep out of the line of lights of the lens.

In groups and cases where as nearly as possible a simultaneous flashing of more lamp than one is desired, success will depend in a great measure upon the form of lamps employed and the method adopted for firing them. Some very ingenious contrivances have been invented for this purpose; but it is doubtful if they all fulfil what is claimed for them.

There is, however, but little difficulty in firing any number of lamps in reason at one and the same moment of time, provided they are of the pattern I recommended in a previous article, and suitable means used for projecting the magnesium into the flame at the same time.

I can remember a case in theatrical working where a full stage was being photographed by means of the flashlight and where this difficulty was experienced, and no end of bother was met with. In all cases where there is a free passage for the pure magnesium powder to reach the flame by blowing, the fault generally lays in the lamps being placed at non-equal distances from the source of pressure on the rubber tubes, and in some instances an insufficiency of power to project the powder into the flame on account of the distances the same was from each other.

Whenever the forms of lamps used are those recommended by the writer in a previous article, there is no difficulty at all in overcoming this when the pressure is supplied from a well-charged cylinder of oxygen gas. By using compressed gas the utmost amount of pressure is easily obtained, care being observed that the coupling tubes to each lamp are not only securely fastened, but that all the lamps have independent tubes of their own leading right up the branch piece at the cylinder nozzle. In the case of two lamps a Y piece is sufficient, but this branch must be possessed of as many ways as there are lamps to fire, and each tube must be of the same length. When these arrangements are carefully attended to, there will be no hitch or trouble in firing several lamps at the same moment of time.

For applying the pressure to the tubes a fine adjustment valve, screwed on to the nozzle of the cylinder, will be found to be the easiest method of suddenly applying the pressure. With a well-appointed set of apparatus of this kind, stage work is successfully performed. The main factor is to make certain that there is no moisture in or about the tubes, and that they are absolutely clear in their passage ways.

Two tube lamps, each containing ten burners, will be ample for any stage, one being placed at the wings on each side, of course as much of the ordinary light used being employed at the same time; this is of more importance than many imagine, and, where light fixtures and dresses are concerned, will tend to the yielding to half-tones in the negatives. With the form of lamp suggested there is no limit to the amount of magnesium that may be placed in the cups, and pure magnesium only should be used.

T. N. ARMSTRONG.



## A SIMPLE ACETYLENE GENERATOR.

For some time enlarging was to me an irksome and unsatisfactory operation, in consequence of illuminating difficulties. I had used magnesium ribbon with but little success, the lighting being uneven and producing patchy prints. Although I kept the burning ribbon in constant motion, and used a ground-glass screen (this latter prolonging the exposure immensely), I abandoned magnesium as a satisfactory light and tried daylight. Daylight was good, but variable, and, of course, with limited time at one's disposal, not always convenient. I therefore gave up the idea of making enlargements from the comparatively few negatives I prized, until recently the merits of acetylene gas as a powerful actinic light came to my notice. Still doubtful, I decided to again try and obtain some satisfactory enlargements.

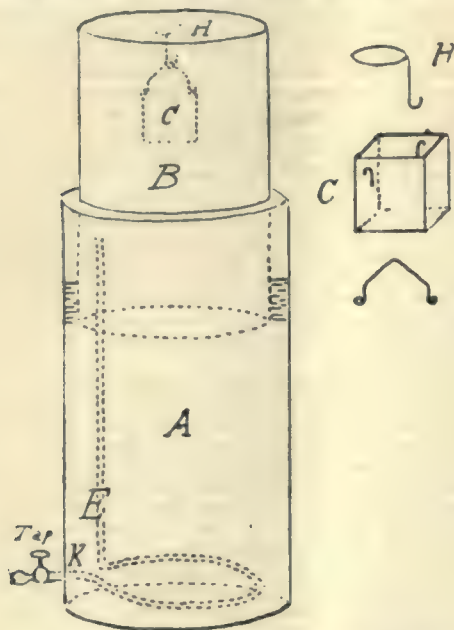
Accordingly, I looked up the subject of acetylene lamps, and came to the conclusion that, amidst many forms of generator, one only would suit my requirements, and that one was fortunately of quite simple principle, and which I have been able to adapt to my needs, and enlarging now offers me little difficulty.

Acetylene gas is formed by the action of water on a substance (calcium carbide), a comparatively new commercial compound of carbon and the metal calcium (the metal of lime) produced by direct union of lime and carbon in the very high temperature of an electric furnace.

## THE APPARATUS IS AS FOLLOWS:—

A is a cylinder of sheet zinc, into the side of which, close to the bottom, is soldered a lead pipe, E.

B is a smaller cylinder of zinc, inverted, from the roof of which is



suspended, by means of a hook, H, in the roof, a perforated zinc cage, C. B is lifted out, and A almost filled with water.

Having taken out the zinc cage and in it placed a quantity of calcium carbide—half a pound to a pound—it is put in place, and the cylinder, B, with its cage, lowered in the water. The tap at K is turned on, and the cylinder slowly sinks. When the cage has almost reached the water the tap is turned off, and the connexion to the gas jets, to be presently described, made, and the tap turned on; the cylinder sinks further, when the cage, with its load of carbide, will come in contact with the water, and acetylene commences to come off. The tap is still allowed to be open, and the mixture, now of air and acetylene, is passed through the jets for a minute or so before the jets are lighted. The apparatus is now ready, and will continue to supply acetylene automatically until the calcium carbide is exhausted.

The details of construction of the generator I will now explain. Having procured sheet zinc, say a piece 4 ft. x 3 ft., which will be enough for a generator having cylinder, A, about 1 ft. in diameter and 1 ft. 6 ins. high, cut a piece 1 ft. 6 ins. x 3 ft. and bend about  $\frac{1}{2}$  in. of the shorter edge, up one end and down the other, so that the two will hook into one another when curled round and thus form a tube. Flatten down the joint so formed with a mallet, against a piece of wood held inside. Clean the joint with killed acid, i.e., muriatic (hydrochloric) acid neutralised by adding zinc scraps until the effervescing ceases, and solder the joint, which, if carefully done, will be quite strong. Now cut a piece of zinc  $\frac{1}{2}$  in. to  $\frac{3}{4}$  in. larger than the circle of the tube. Hold this on the tube and beat down the edge of the circular piece of metal to turn up close to the tube all round. This is somewhat difficult at first, and it is perhaps

advisable to fix the bottom on temporarily by a drop or two of solder, of course after cleaning with killed acid to ensure the solder holding. The edge being beaten up close all round, the joint is cleaned and soldered. A piece of composition gas pipe,  $\frac{3}{8}$  or  $\frac{1}{2}$  in. size and 4 ft. long, is bent in a circle 9 ins. in diameter, with a short end of some 3 ins. to go through the side of cylinder, A, and projecting in the plane of the circle, and the long end standing up at right angles to the plane of the circular part. A hole is now punched in the side of the cylinder, one inch from the bottom and just large enough to admit the pipe. The metal around the hole is cleaned and the short end of the pipe is scraped clean, inserted so as to project about two inches, and soldered in place. I found it an advantage while soldering the pipe in the hole to support the remainder of the pipe by means of cloths placed inside the cylinder, A, which was itself supported firmly in a horizontal position. On the end of the composition pipe at K a gas tap, with nozzle for india-rubber tubing, is soldered. The cylinder, A, is now complete.

Cylinder, B.—A piece of zinc 1 ft. 6 ins. x 2 ft. 6 ins. is now taken, and the shorter edges bent, joint soldered, and top put on, as in the case of cylinder, A, except that, before the zinc plate to form the top is fixed, a hook of galvanised iron wire is soldered to the centre of the plate on that surface which is to be inside. The hook may easily be made of a piece of moderately stout wire, bent in a circle, with a hook bent up at right angles to the plane of the circle. The top is put in place, the edge beaten down and joint soldered, and the hook will now be in the position for hanging the cage from; and cylinder, B, is complete.

The cage, C.—A piece of perforated zinc,  $12\frac{1}{2}$  ins. long and 4 ins. deep, is bent to form the sides of a sort of box of 3 ins. side. The joint soldered, a piece of perforated zinc,  $3\frac{1}{2} \times 3\frac{1}{2}$  ins. is now cut,  $\frac{1}{2}$  in. of each edge turned up and fitted to the sides and joint soldered, thus making a cage  $3 \times 4$  ins., with open top. Two pieces of moderately stout wire in the form of hooks are now soldered to opposite sides near the top of cage, another piece of wire about 5 ins. long, with loop made at each end to engage with the hooks, and bent to an angle to form a means of swinging the cage from the hook in the roof of cylinder, B.

For the purpose of lifting for charging, a wire handle may be soldered to the top of B; a considerable convenience, but not absolutely necessary.

The apparatus is now complete for the making of acetylene, when cylinder, A, is filled with water and cage, C, with carbide.

A coat or two of good enamel will improve the look of the generator.

With regard to the remaining portion of the lighting apparatus, that, of course, depends to a large extent on individual requirements. For my own purpose of enlarging from half-plate to  $12 \times 10$  ins., I found three Bray's burners, of size 00000, give a good light, and yield evenly exposed prints with an exposure, though a normally dense negative of one minute. The three burners are arranged in line about 3 ins. apart. The burners may be screwed into a piece of lead pipe about 1 ft. long, one end of the pipe being either soldered up, or simply beaten flat and bent over and beaten again. The pipe is fixed to a substantial block of wood by bent nails. This rather primitive arrangement can be improved, and in the event of requiring the light for a much longer period than that mentioned—one minute—the lead pipe should be replaced by a piece of  $\frac{1}{2}$ -in. diameter brass pipe, drilled in its length with taper holes, to receive the burners. It is evident any number of burners can be used if a sufficient length of brass tube is available, but for enlarging I have found three ample. For taking portraits, eight to twelve burners may be arranged at a height of about 7 or 8 ft., placed at the side of the sitter. On the opposite side to the light a white screen (a sheet answers excellently) must be so placed as to soften the shadows by reflected light. The conditions of exposure I have found are (a) light (eight burners), five feet from sitter; (b) on opposite side white reflector, close to sitter; (c) ordinary plates; the necessary exposure was four seconds. The negative was excellent; the high lights being clean, yet soft, and the shadows well illuminated, it compared very well with an ordinary sunlight photo.

A. E. T.

## THE FUTURE OF ACETYLENE.

The production and use of acetylene has now passed the purely experimental stage, says Prof. Vivian Lewes, and the only question as to its future is whether its use is to remain as a luxury or to expand into an important factor in modern civilisation. Should it be found impossible to lower the price of the calcium carbide, from which this brilliant illuminant is derived, by the simple process of bringing it in contact with water, then the field of utility enjoyed by the gas will be restricted to those districts where coal gas is unknown, and where it becomes invaluable as an illuminant for country houses. It will also undoubtedly play an important part in the railway lighting of the near future, as twenty per cent. of it added to oil gas doubles the illuminating value and enables the gas cylinders to run for double the time at less than double the cost. If, however, improvements in the method of manufacture or other causes lead to the cheapening of the calcium carbide, an unbounded future is opened this interesting hydro-carbon.

Already in America cheap power has enabled carbide to find its way into the gasworks, and acetylene is beginning to be used as an enricher of coal gas—a function which it is specially fitted to perform, as its freedom



from condensation during cold weather gives a permanency to the illuminary power of the enriched gas which cannot be obtained by any other means.

The only fear with acetylene is the attempts made to develop its use in directions for which it is not fitted. For instance, there is no one who knows anything of the subject who does not look with grave distrust on the acetylene bicycle lamps that are being placed on the market. In the first place, if the lamp behaves itself, the light given is far too strong, and tends to startle horses and blind pedestrians; whilst, in the event of a spill, the flare caused by the sudden shake up, and probable overflowing of water into the carbide, taken in conjunction with a muslin dress, supply the factors for a tragedy that one shudders to contemplate.

Given a good generator, not automatic, but with a holder capable of containing the whole of the gas generated by the charge of carbide, good burners, and proper fittings, acetylene is an ideal light.

The contamination of the atmosphere is, light for light, less than with any other illuminating flame. Plants are not injured by it, and colours stand out in their true tints, whilst the problem of finding a suitable burner, which has been one of the greatest troubles in utilising the gas, has now practically disappeared.

#### NEWMAN & GUARDIA'S LIMELIGHT JET.

FIG. 1 is a side elevation of a limelight apparatus of ordinary construction, but with the invention applied thereto; fig. 2 is a plan of same; and fig. 3 is a longitudinal section of the part of the apparatus comprising the invention.

Messrs. Newman & Guardia say: For the purpose of our invention we employ a burner, A, mounted at one end of a tube, A<sup>1</sup>, and directed in the usual way so that the jet of combined gases issuing from it impinges against the piece of refractory material, c, in the manner well known in connexion with this kind of light-producing apparatus. The end of the

annular space, g, between the two tubes, B and D, except at the front end. Combustible gas, such as coal gas or hydrogen, for example, is admitted through the branch, N<sup>1</sup>, into the annular space, g, between the inner and outer tubes, and oxygen under pressure into the inner tube, D. The jet of oxygen issuing from the nozzle, E, at the end of the inner tube, D, enters the trumpet-mouthed end of the tube, A<sup>1</sup>, connected with the burner, A, and draws with it, somewhat after the manner of an injector, a current of the coal gas or hydrogen from the annular space, g<sup>1</sup>. The oxygen and coal gas or hydrogen mix together in the tube, A<sup>1</sup> (which is the only mixing chamber we employ), and pass on to the burner, A, where they burn in the usual way, the flame impinging upon the refractory material, c, heating the latter to a white heat and thereby producing an intensely bright light as usual. By these means, as a mixture of gases only takes place in the comparatively small tube, A<sup>1</sup> (which is preferably of about the same cross section throughout its length and without contractions at any part), and not in a comparatively large mixing chamber with a contracted inlet and outlet as heretofore, the quantity of mixed, and therefore explosive, gas present at any given moment is extremely small, and the danger due to explosion is consequently reduced to a minimum.

In order to minimise, as far as possible, the effects of the small explosions which are possible even with our improvements, we employ a safety valve, N, in connexion with the annular space, g, between the inner and outer tubes, D and B, so that, when a trifling explosion occurs in the tube, A<sup>1</sup>, or in the front part of the annular space, g, the safety valve, N, opens and the pressure is relieved. The safety valve, N, also serves the purposes of preventing such a rise of pressure in the annular space, g, by the access of oxygen thereto, as would permit of the oxygen travelling back into the pipe supplying the coal gas or hydrogen.

#### WEISS'S APPARATUS FOR DIFFUSING THE LIGHT IN PHOTOGRAPHING BY ARTIFICIAL LIGHT.

The apparatus consists of a curtain, 1, made of transparent material, which possesses the faculty of spreading the rays of light. For this purpose tracing cloth has been found suitable. The curtain is fixed to a shaft or axis, 2, so as to be rolled up or

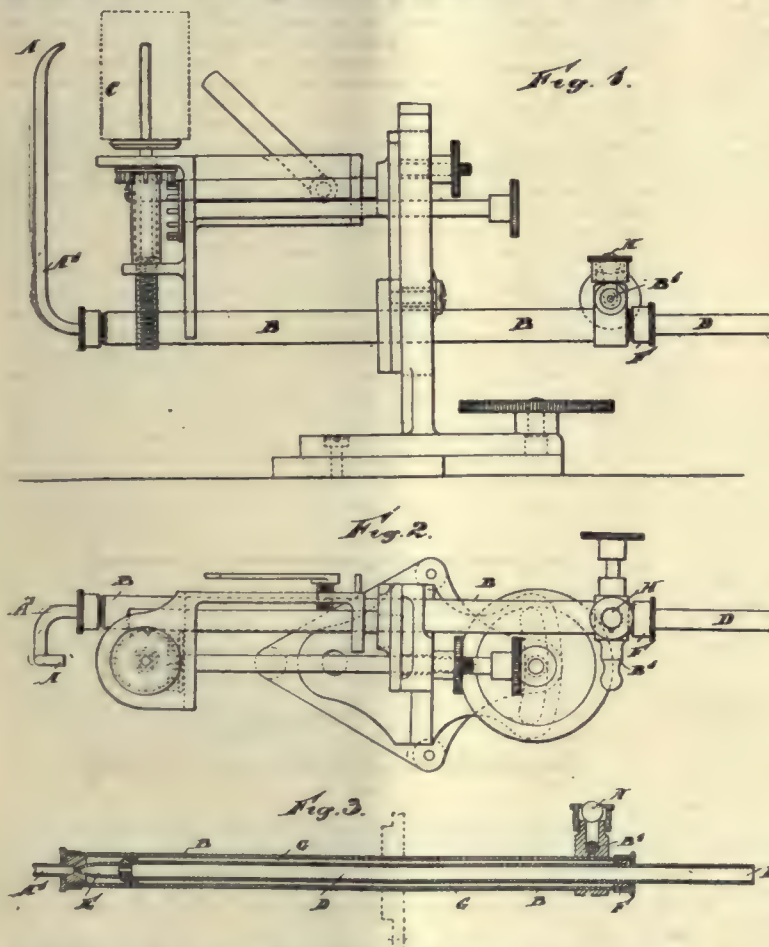
down, the shaft being rotably seated in the arms, 3, 4, of a bearing rod, 5, and carrying on one end a cord, 6, for rolling up the curtain. The bearing rod, 5, is fixed to a vertical rod, 7, which, with a sleeve or socket, 9, fixed to a tripod, 8, forms a stand.

By means of this arrangement the curtain, 1, can be adjusted to any desired height.

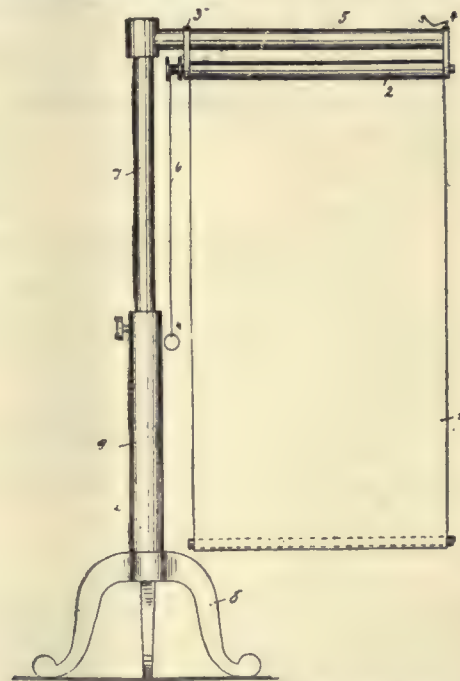
#### WARM TONES ON WET-COLLODION SLIDES.

"COLONIAL" has not read me correctly; it is a long time (some years, I think) since I wrote an article on wet-collodion work. The reference to it which I permitted myself on December 2 was purely reminiscent; at the same time, the query put can, I think, be answered without much

\* See THE BRITISH JOURNAL OF PHOTOGRAPHY, December 23, 1898.



tube, A<sup>1</sup>, opposite to that from which the jet of combined gases issues, is trumpet-mouthed, as shown in fig. 3, and is connected with the front end of a tube, B, which contains within it a third tube, D, the front end of which is provided with a nozzle, E, directed towards, and preferably entering, the trumpet mouth of the tube, A<sup>1</sup>. The rear end of the inner tube, D, passes through a stuffing box, F, in the rear end of the outer tube, B, or is otherwise so adapted that no gas can escape from the





difficulty. Warm tones are to be had more particularly with mercury re-development or intensification. Premising that sepia is a colour as to the exact shade of which a great variance of opinion seems to exist, e.g., I have had sepia carbon tissue which is not at all what my preconceived idea of sepia led me to expect, and I don't know two people who agree as to the exact colour or tone: but let us take it to be a dark reddish-brown, and, if my memory is not at fault, you will get more or less approaching the shade with combinations of the following chemicals: Gold chloride, mercury chloride, uranium nitrate, potass ferridcyanide. Take the usual uranium intensifier, and add to it a few drops of mercury chloride solution. A simple formula is:—

Ferridcyanide of potass .....	2 grains.
Uranium nitrate .....	2 "
Chloride of gold .....	$\frac{1}{10}$ grain.
Water .....	1 ounce.

But the tone is not so warm as with mercury chloride. Of course, "Colonial" has tried the usual toning solutions and the old sel-d'or combined toning and fixing bath?

Now, there must be some body and vigour in the slide, or no large amount of colour will be got out of it. *Exposure also, developer, and extent of development* have to be considered. Some interesting articles on this subject are to be found in *THE BRITISH JOURNAL OF PHOTOGRAPHY* of earlier years—1888, 1882, and 1881—not to go further back; and, upon this very point of warm colours in wet-plate slides, I may quote *THE BRITISH JOURNAL OF PHOTOGRAPHY* for January 21, 1881, p. 26: "The colour of a toned transparency depends to a great extent upon the character and colour of it before toning, for, if it be too cold in the first instance, none of the usual toning agents will render it warmer, unless, indeed, we have recourse to mercury" (my italics). "If warm tones are sought for, the development of the picture must be so modified that it comes out of a brown or reddish-brown colour. To secure this colour, the bath should be in the best working condition, and the collodion as newly iodised as will yield clear lights. A full exposure must be given, and the picture brought out with pyrogallie acid, restrained with acetic acid only. A liberal quantity of solution should be used to dilute the free silver on the plate, so that the detail is well rendered before much density is obtained. With a picture of this character almost any tone, &c., may be obtained by after-treatment with gold, platinum, or palladium. The colour may be considerably modified by the use of citric or tartaric acids as a restrainer in place of acetic, while, by the admixture of both, a great variety of tints may be secured without after-toning."

The silver bath which I invariably used was the following:—

Recryst. nitrate of silver .....	1 ounce.
Nitrate of baryta .....	40 grains.
Iodide of potassium .....	1 grain.
Distilled water .....	12 ounces.
Glacial acetic acid .....	2 minims.

Enough for two or three baths was made and kept "sunned" as far as possible when not in use; the developer was usually "iron":—

Iron sulphate .....	150 grains.
Methylated spirit .....	$\frac{1}{2}$ ounce.
Glacial acetic acid .....	$\frac{1}{2}$ "
Water .....	10 ounces.
Brown sugar .....	$\frac{1}{2}$ ounce.

Made up in quantity and kept as long as possible before use. The collodion was generally an old sample, or, if new, tinted with iodine tincture. Occasionally a drop of pure nitric acid would be added to the silver bath.

A great deal more could be said, but I think the above will put "Colonial" on the right road.

J. PIKE.

### "BY COOT AND HERN."

THE tangible possession of a camera is a powerful incentive to strike out for new scenes far remote from the beaten track; and I opine that, if the sun, "snapper up of unconsidered trifles" (I do beg he of Avon's pardon), has accomplished this, the camera has not existed vainly.

Last year, for a brief break in the monotony of every-day life, I got away to sunny Belgium, to explore the merry Meuse, which ambles along so peacefully through a veritable fairyland of Flora.

Equipped with a Kodak and a supply of spools, my impedimenta weighed but a few pounds, and even Monsieur le Douanier smiled harmlessly at my little instrument and tapped it playfully as he passed my baggage at Antwerp.

The best route to the merry Meuse is undoubtedly by the Great Eastern Railway *via* Harwich and Antwerp; passengers leaving town on Saturday night arrive at Brussels in time for service at the Cathedral on Sunday. Thence the journey may be continued to Namur, where the night should be spent. Here we are on historic ground; one calls up memories of Uncle Toby, and smiles at the literary eccentricities of his creator; from the fortress there is a fine panoramic view which, thanks to a particular bluish of M'sieu Sol, we are permitted to carry off; in the

by-streets there is much worth photographing; and then we get down to the landing-stage, and book by boat to Dinant.

Surely this is a picturesque pilgrimage; it matters little which way one looks; foliage and fern, castle and crag, prettiness and purity, peep out at every corner. One can use all his spools long ere Dinant is touched, but that we have other pictures ahead.

At Dave, Godinne, Profondeville, there is ample to repay the peregrinating pilgrim; the Bois de Dave is alone worth the visit twice over.

Once at Dinant, we have no end of excursions before us; this merry Meuse is enchantingly lovely, and it would be futile to guess how long one would be inclined to stay there; but our hours of idleness come to an end, and we hark back to the conventionalities of life, impressed that there are many more happy days in store for our camera and ourselves when the opportunity occurs. I do pray that it be soon, for this ramble "by coot and hern" has positively spoiled me!

WILFORD F. FIELD.

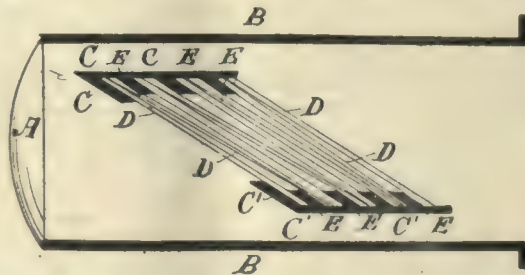
### STEREOSCOPIC EFFECT ON THE SCREEN—MR. ANDERTON'S SYSTEM.

My present invention, says Mr. Anderton, has for its object certain improvements upon the method or system by means of which pictures projected upon a screen from an optical or magic lantern or lanterns are seen in relief or with stereoscopic effect, forming subject-matter contained in my former specification of patent bearing date July 7, 1891, and numbered 11,520, to which reference may be had and in which it is stated in dealing with the subject that preferably a number of glass plates placed at the requisite angle for producing polarisation by refraction, enclosed in a convenient case or frame, will be used.

These plates are so arranged in each lantern that the light from one will emerge polarised in a plane at right angles to that emerging from the other. That the images of the two stereoscopic slides or pictures, each polarised in a plane at a right angle to the other, are projected and superposed on a screen of ground glass, metal, or any other substance or material that will not depolarise or elliptically or circularly polarise the images it receives. Preferably a calico screen covered with dead silver paper is used. It will be understood that the scientific arrangement of the apparatus, as to the fitting up of same, is governed in the present case by the scientific principles described in my 1891 Specification, No. 11,520. The thin glass plates are placed in a suitable case or frame contained within a lantern having an objective lens. The drawing herein-after more particularly referred to clearly illustrates the arrangement. Now, the dead silver paper referred to in connexion with the calico screen, although serving the purpose of reflecting the polarised light as received, possesses certain defects, namely, the squares of silver leaf composing it are visible and tend to mar the effect of the pictures projected upon it.

Further, the nature of its reflecting surface is such as to cause a deficiency of lateral reflection, and consequently the stereoscopic pictures projected upon it cannot be seen with proper effect excepting when the observer or observers are stationed within a certain limited space directly in front of the screen. In other positions the pictures would appear darker than when seen from a front position and also uneven in illumination, the side farthest from the observer appearing darker than the side nearest to him.

It is to obviate these defects that my present improvements apply. I cover the silver surface of the screen with perpendicular lines or striations, the angle at which a bright and effective view of the stereoscopic pictures may be seen being largely extended, and the solidity and



general effect of the pictures is also greatly improved by this means when seen from a position directly in front of the screen.

An important point in my present improvements is the use of polarisers and analysers in conjunction with a lined or striated metallic screen, with the object of obtaining stereoscopic effects from pictures projected upon such screen.

A further improvement upon my said prior patent of 1891 consists in provision being made for the protection of the thin glass plates of which the polarisers and analysers may be composed from the action of the atmosphere, and, consequently, moisture becoming gradually condensed upon the inner surfaces, thereby rendering them dim and practically useless. And my said improvements in this respect consist in covering the edges of the said thin plates with cement, that will not itself decompose, and



will also sufficiently exclude the air, and, again, by cementing the plates within a metallic frame, mount, or case, as a further protection from deterioration, from condensation of moisture, or from other cause or causes.

Furthermore, the thin glass plates were previously in my former specification arranged at slightly varying angles to each other in order to distribute the multiple reflection from the inner surfaces; this was effected by inserting thin strips of metal or other material between the glass plates, but at one end only. An improvement upon this method consists in alternating the strips of metal or other material for tilting the glass plates. I will here draw attention to the diagram annexed, in which *a* represents the lens or objective of the tube, *b*, of the lantern, *c*; *c*<sup>1</sup> is the mount or case into which the thin glass plates, *d*, are cemented; *e* represents strips of metal or other material placed alternately at the top and bottom in order to give the thin glass plates, *d*, different angles in the same plane for the purpose of producing the effect already referred to.

As seen from *A*. For example, a strip, *e*, of metal or other material is placed between the glass plates, 1 and 2, *d*, on the right hand in the case, *c*<sup>1</sup>, then a strip of metal, *e*, or other material is placed between the glass plates, 2 and 3, *d*, on the left hand in the case, *c*, and again between plates, 3 and 4, *d*, on the right hand, and so on until the bundle of plates is completed.

By arranging the plates as described and shown a well-defined image is obtained. I may sometimes deem it advisable to somewhat modify the details and arrangement above set forth without, however, departing from the essential features of my invention.

#### ENLARGING.

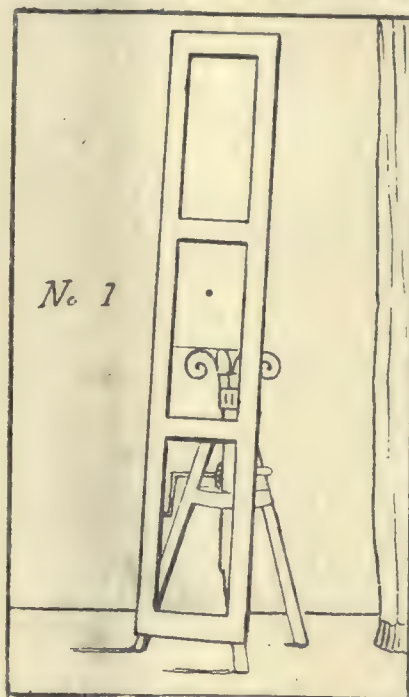
At a meeting of the Leeds Camera Club, held on Wednesday evening, December 28, "Enlarging" was the subject dealt with by Mr. John H. Gash, who said no doubt there were many who at times felt they would like to see a favourite negative in a larger size, but were deterred by the impression that enlargement was a difficult matter and required costly apparatus. That idea was entirely wrong, for any one having a camera could, by using daylight and a little trouble, produce an enlargement to the size they desired and at little or no extra cost. Choosing, then, a window facing north for preference, place outside a board, previously covered with white paper or cotton, at an angle of 45°; this will reflect the direct light from the sky through the window. The camera should now be placed on a table, with its focussing screen as close as possible to the window, and in front of the board already in position outside. With a curtain, or a piece of American cloth, block out all light coming through the window except that passing through the camera, moving now the focussing screen from the camera; place the negative in its place, having its film side to the lens. Another board is now required on which to pin the bromide paper, and this board must be placed vertically and quite square with the camera. Its position or distance from the camera is determined by what size the enlargement is to be; say, if it is desired to enlarge from quarter-plate to 12 x 10, that will be about three diameters. Multiply the focal length of the lens by 3 and add the focal length, and the result is the distance from the lens to the board. Divide this by 3, and the result is the distance from the lens to the negative. For example, if using a lens with eight-inch focus, then 8 by 3 are 24, and 24 and 8 are 32, then 32 inches is the distance of paper from lens, and 32 divided by 3—nearly 11 inches—is the distance of lens from negative. It is, therefore, quite evident that 32 and 11+43 inches is what the board will be from window. The image will be visible on the paper, and only requires putting in exact focus by means of the camera screw, and your image is the required size. Do not stop down the lens more than is required to bring all parts into focus, use slow brand of paper, and take three or four trial strips, taking in both the highest lights and deepest shadows, starting with about ten seconds' exposure at *f*-16. When satisfied you are correct, pin on your 12 x 10 sheet of paper, expose, and develop.

Mr. Gash then dealt with artificial light, and in this case, using oil lamp, ordinary gas, or incandescent gas, a condenser is necessary, and it must cover the negative or that portion of it that is wanted. Expensive enlarging lanterns, whilst convenient, are quite unnecessary, for now we can curtain the doorway, placing the camera, with its lamp and condenser, outside, and allowing only the lens to project through a hole in the curtain. The board is again placed in its proper position, its distance determined as before, care being exercised to see that it is vertical. It should be moved until the image is in proper position and truly focussed. At this point a most important fact must be noticed. Take out the negative, and see if the disc of light is equal, and if any dark shadows appear. Remove the lamp nearer to or farther from the condenser until all parts of the disc are equally bright. The negative can then be replaced, the curtain put back, and all light except that coming through the lens stopped out. Then put on the lens cap, pin up paper, and expose again, making several trial strips until correct exposure is obtained. The question of the paper is largely a matter of opinion; but, whatever brand is used, use the developers recommended with it by its makers, and either the metal or the oxalate and iron will give equally good results, though, for a beginner, Mr. Gash thought the metal was the best, as this could be diluted with water to produce softer results if desired.

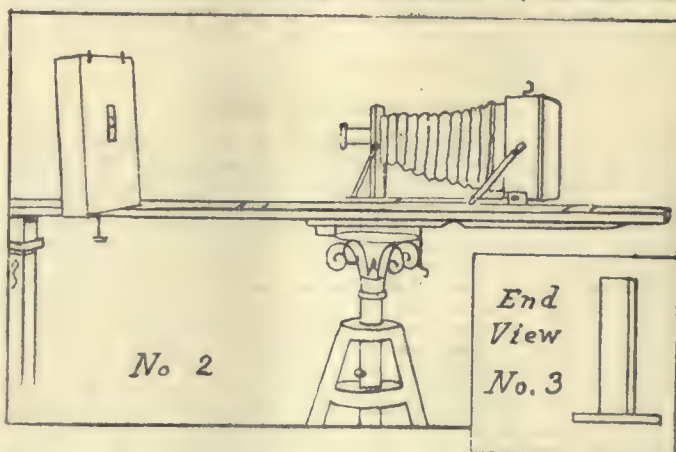
#### A CONVENIENT ARRANGEMENT FOR COPYING.

To the table of an old camera stand is fixed a long open-work frame with slightly raised edges, which, when out of use, is dropped as in fig. 1, taking up little room.

When required for use, the longer end is supported on anything firm.



An upright board, to which a flange is screwed (fig. 3), is fixed with a clamp, as shown in fig. 2, and the camera is placed on a board, which slides easily between the raised edges of the frame. By this means the



camera and object to be copied are easily kept parallel, and the distance between them is readily adjusted.

The upright board is covered with black velvet, and the opening in the upper end of the frame is filled in with a dark material, rendering it more easy to see to focus.

#### BUTTERWICK'S HAND CAMERA.

"Yes," said Butterwick, "I did make that hand camera myself. People may sneer at it—I suppose Jones has been telling you about it—but when I set out to construct it I was determined to produce an instrument which should be original in conception and design. I have succeeded beyond my wildest expectations.

"Of course, firms who make a speciality of hand cameras may be jealous, but I am glad to say that every house to whom I have exhibited it has had the honesty to declare that they have nothing like it on their lists. A distinguished authority on hand-camera mechanics was looking at it only yesterday. His words were: 'Seriously, Butterwick, good is not the word for it.'

"Of course, people will make remarks. When you say that it is



'hardly an advantage to have the sheaths and plates with all that amount of play, you only show me how utterly unable you are to grasp the scientific principles which underlie the construction of the camera. I made those sheaths rather too large for the plates and rather too small for the camera on purpose. It's the only way to get rid of rattle. Look here! You take the camera out, and you certainly do get a little rattle for a minute or two. What becomes of the motion of the plates and sheaths? It's converted into heat. Don't you know that heat is a mode of motion? The rest is simple. The heat, of course, expands plates and sheaths, and wedges the whole tightly and automatically into a coherent mass. It's the simplest possible application of molecular dynamics.

"Then, you don't mean to say you can't see why the shutter is arranged to go off vigorously? You surprise me! A short, sharp shock is hardly an ideal factor in a hand-camera release, you say? My dear sir, kindly look at the matter in an unbiased frame of mind. Are you or are you not acquainted with the value of horizontal and vertical lines from a pictorial point of view? Do you or do you not know that a celebrated photographer uses a slit instead of a lens, vertical or horizontal, according as he wishes to emphasise those particular lines in his composition? My release does this while at the same time fully exposing the plate in a fraction of a second. I should have thought that the most unenlightened mind would have perceived that, by giving a slight displacement to the side of the camera at the moment of exposure, the vertical lines are broadened in a manner which pleases the eye and appeals to the finer sensibilities of the mind, whilst an upward displacement (instead of a lateral) does the same for the horizontal lines. Of course, sir, I don't expect that the man who is content with the 'usual thing' will appreciate the advantages of my hand camera.

"So Jones has been telling you he don't care for the idea of the shutter occasionally cutting off half the picture from the plate! He said the same thing to me. It only convinced me that Jones is singularly unacquainted with present-day utterances on pictorial photography. You take up a photographic paper, and you'll find the editor talking like this: 'How often must we allude to that commonest of defects in the prints which our readers submit to us for criticism, viz., the inclusion of too much subject? Had an inch been trimmed off the right-hand side of your print, its pictorial quality would have been immeasurably enhanced.' That's just what my hand camera does—removes superfluous subject.

"No, I haven't patented it. Do you suppose that, after devoting so much of my valuable time to constructing an instrument that will bring credit and renown to the photographic art, I shall offer any obstruction to its use by every photographer in the land? I am content, sir, to let a fabulous fortune go by, and to bequeath my camera to the photographic world and its heirs for ever. 'Palmam qui meruit ferat.'"

VANDYKE.

### HOW I HOLD MY CAMERA.

In the course of a few seasons' experience with hand-camera work, when taking photographs during the holidays and on occasions of festivals, prize-givings, or processions, I have found it impossible to secure a point of vantage that enabled me to avoid having very large heads or figures in the foreground of the picture if I held the camera in the orthodox manner. I therefore obtained an idea of the composition of the picture by looking into the finder, and the moment before the exposure, lifted the camera so that the back of it rested against my forehead. Looking along the lower edge to level the camera, I waited for the interesting portion of the ceremony, and then touched the release of the instantaneous shutter. Unless one is very tall, this method of avoiding too much foreground is very satisfactory—at least, I have found it so—and there is less likelihood of shaking the camera than if held against the side of body or on the chest. On one occasion, in Ireland, at a distribution of prizes by Lord Roberts, the only elevated position I could get was on an ordinary chair, and then the busbies and caps of the soldiers interfered with my view; so, taking a guinea pocket Kodak, I held it above my head as far as I could stretch my arms, and, when fairly level, made the exposure. The result was so good that, notwithstanding there were at least 200 people in the group, the principal personages could easily be recognised, and, when enlarged to half-plate size, were quite sharp and the portraits remarkably clear. On more recent occasions I have used the pocket folding Kodak in the way described, by resting against my forehead, and at the last Lord Mayor's Show exposed a dozen quarter-plates in a Holiday hand camera.

I don't mean to say that on all occasions it is the best way to hold the camera, but I do think on many occasions it is; and if a concave glass or square section finder is fitted to the bottom portion, so as to just include the amount that will be shown on the plate, it leaves little to be desired.

I have seen it advocated to hold the camera under the chin, but never against the forehead, and, as in country work one often wears a soft cap, it will rest against that as well as against the forehead; but even with a hard hat it is simple to push it on the back of the head for the time being. Perhaps some of your readers may find the method worth trying.

G. R. BAKER.

### THE "CHROMO-GRAPHOSCOPE."

THE direct photography in colours—that is, the reproduction of objects in their natural colours without employing anything else than the sensitive plate—is not yet generally practised, notwithstanding the splendid experiments of Professor Lippmann; on the contrary, the indirect method is now employed in most photo-engraving establishments. As is known, says M. G. Veuille in *The American Annual of Photography*, the process permits of the reproduction of the photographed object in as many proofs as desired, by means of the three fundamental colours whose reactions are originated by the light itself.

By this method, devised a long time ago by Messrs. Cros and Ducois du Hauron, one must first make three negatives under certain conditions and through properly coloured screens, then print the diapositives in colour, which, by their superposition, give the sensation of the colours of the object. This double and delicate operation is extremely simplified by the use of the chromo-graphoscope of Ducois du Hauron. With this apparatus—which the firm of H. Mackenstien, of Paris, has constructed under the guidance of the inventor—the negatives and the adjustment of the plates used are made in an automatic manner, so to say.

With the chromo-graphoscope M. Ducois du Hauron makes three monochromatic images, one by the side of the other, on the same sensitive plate, the position being regulated beforehand, screens—violet, green, red—correctly adjusted, act as the ray filter for each negative. To avoid the image appearing reversed, the apparatus is provided with a prism, and the chromo-graphoscope must therefore be placed vertically, the lens turned towards the zenith.

When the negatives are obtained one by the side of the other, one can utilise them immediately for the operations actually in use for printing in three colours; but, if one prefers to use the apparatus itself to obtain the coloured representation of the objects photographed, this can also be done, all that is necessary is to make a diapositive of the triple original on a plate glass, and this proof being placed where the negative was before will give, by means of the coloured screens and the mirrors of the chromo-graphoscope, the synthesis of the colours and the desired effect. In this case the lens is replaced by a kind of ocular, that is to say, a magnifying lens.

To speak of a colour-blind artist sounds like joking, said a noted London oculist; but, strange as it seems, there are several persons so affected who can, nevertheless, paint extremely well. Numbers of colour-blind people there are, of course, who draw perfectly in pencil, ink, and crayons, but I myself know a scene-painter attached to a provincial theatre who, though "colour-blind," paints all its scenery, and has quite a local name, not only for his "interiors" and oak chambers, but even for landscapes. I can tell you also of two London ladies who consulted me for colour-blindness who paint really beautiful pictures. One is the daughter of a late famous artist, and was taught painting by her father. She is quite unable to distinguish red from green, but her colours are labelled with the names, and she has been taught which to use for certain effects. Possibly her painting may seem to her eyes, as it were, drawing with a brush and "shading" with the colours. The other is a lady artist of some celebrity, who has for years exhibited annually in London. The public are not aware that she is colour-blind. She painted the *Wedding Group* for a certain noble bridegroom a year or two ago, and also several public men's portraits, and one of an eminent physician fetched 500 guineas. There is a gentleman residing at Kensington who, having years ago left the Navy through finding his advancement hopelessly barred by his colour-blindness, is at present making several hundreds a year by his brush as an artist, designing most artistic and brightly coloured picture "posters" for advertisement boards.

THE BALLOON AS AN OBSERVATORY.—The balloon has now been recognised as an indispensable observatory, says the Rev. John M. Bacon, in the *Contemporary Review*. In some ways it affords the student of astronomy and optics opportunities which cannot be gained in any station on earth. The extraordinary brilliance and steadiness of celestial objects viewed by optical aid from a balloon 10,000 feet or 12,000 feet above sea level must be seen to be realised. Indeed, from half that height, the full moon, regarded through an ordinary field glass, becomes an object intolerable to gaze upon; but the case is far otherwise on mountain observatories, which cannot be wholly free from disturbing currents or from that peculiar stratum of air always and everywhere clinging to earth. It is obvious, then, how many questions can be dealt with to great advantage from higher and purer regions. Most important data are being gathered bearing on refraction as influenced by altitude, by temperature, and humidity. Spectroscopic observations taken from the earth, and again a few minutes later from some thousands of feet above, are destined to throw very valuable light on those lines which have simply a telluric origin. It is even reasonable, indeed, to hope that the corona may be photographed without eclipse. Again, many doubtful observations needing low powers, and hitherto made from earth, will receive a crucial test when repeated from above, and rare phenomena, such as a total solar eclipse or shower of meteors, too often hid from the observer below can hardly escape the view of the voyager above the clouds.



# MONTHLY SUPPLEMENT

To the "BRITISH JOURNAL OF PHOTOGRAPHY."

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# THE LANTERN RECORD.

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## LANTERN MEMS.

It is often the unexpected that happens, and, if a catalogue could be kept of difficulties experienced and *contretemps* in connexion with lantern entertainments, it would be a bulky volume. There are few lanternists but have had their little or great difficulties, and fortunate is the lecturer who has not experienced a trial, even if he has not been put in a dilemma. Slides put in the wrong place or upside down, a reference to the on-coming slide which was totally opposite to what appeared, unexpected failure of the light, either through faulty lamp or jet, indifferent manipulation, or the gas going out.

PERHAPS one of the most ridiculous and awkward experiences of this sort took place at a chapel some little time before Christmas. It was decided to give the young folks a treat, and what more suitable than a lantern entertainment? The question of subjects to be chosen was a vexed one, and, as some of the organizing body thought, as it was to take place in the chapel, nothing frivolous must be chosen, the, to most minds, suitable subject of the "Pied Piper of Hamelin," which was suggested, should follow a "Tour in Switzerland," was tabooed, and the "Life of Moses" substituted. All went well until the end of the series of the latter, when the operator, perhaps thinking the pent-up feelings of the young folks wanted a safety valve, put in the lantern the comic slipping slide of "Man beating boy." The effect was wonderful, for a roar of laughter followed that would have delighted the heart of a Sir Wilfrid or any one who can give or appreciate a joke.

MOST lanternists know this slide, and when it is remarked that the boy is laid across the man's knee, and is receiving a whipping from a cane, one can realise how ridiculous the incident was, and the annoyance of the deacons and others connected can be better imagined than described. However, after the affair was over, and the matter was discussed, it was suggested that the operator should not be blamed too much, for, with a little stretch of the imagination, it might be found to work in. "How's that?" said some one, "Because it was evidently meant for Moses striking the rock! Ah! ah!"

THE more one uses the electric arc light in lantern work the more interesting it becomes, and, provided a suitable current is available,

also good carbons and a well-constructed lamp, the light can fairly be said to be an ideal one, for it is not only extremely easy to regulate, is clean in manipulation, but gives intense light and magnificent definition. As regards the latter, lenses of quite average quality, and single achromatics of good make and long focus give projections of such excellent sharpness that they are nearly equal to the most expensive combination. If an ammeter is at hand, and can be connected in the electric circuit, it is most interesting to watch the fluctuations of the hand as the "arc is struck," also as the light settles down, and, finally, as the carbons burn away and the arc lengthens in consequence. The higher the ampère, the greater the light, and, if the carbons are fed regularly, the maximum light with steadiness is maintained.

REFERRING to a few notes made the other day when testing a new form of variable resistance, it was found that the difference in the position of the carbons made an enormous difference in the ampères of current employed, and consequently in the intensity of the light, it being as much as eighteen ampères when properly adjusted and working steadily, with the upper carbon at the best position behind the lower to give best results, and several ampères less when separated too much or with the carbons not suitably set. If the connexion were improperly made and the negative were connected to the positive terminal of the lamp, the intensity of the light was very much reduced, and in the particular instance the ampère was eighteen with the lamp properly connected up, and only thirteen ampères when incorrectly connected.

THE earlier fault found with electric arc lamps when used for projection, namely, unsteadiness or flickering, have entirely disappeared with the introduction of the modern pattern hand-fed lamps and carbons of a homogeneous nature, and all the elaborations of clockwork and other automatic methods are now known to be superfluous, for perfect lamps for optical projection can be provided by the various combinations of feeding the carbons in the proper ratio of burning, two of positive to one of negative if both carbons are the same size, and one and a half to one, if the positive is larger than the negative, say 12 mm. cored to 10 mm. solid carbons.

IT is curious how old ideas are resuscitated. This was brought prominently to my notice when an artist who was a pupil of the late Mr. Child, of early dissolving-view fame, showed me an example of a large hand painting for the magic lantern which had been drawn on a concave glass like a watch glass. Theoretically it was thought that this would neutralise the distortion produced on the screen from the employment of simple lenses for the projection, but in practice the difference between it and one from a flat glass was practically nil, and hence the plan was not adopted. This par. may therefore be of interest to those who read some little time back in THE BRITISH JOURNAL OF PHOTOGRAPHY about this subject.



A most interesting exhibition of binocular microscopes of modern and curious type was given at a recent meeting of the Royal Microscopical Society, and, although not strictly within the domain of lantern matters, the microscope is so often used in connexion with the lantern for projection, and with the camera when taking photomicrographs, that a short account of some of the exhibits may not be out of place. The exhibition was instructive even to those like myself who are constantly in touch with all scientific instruments, and I think the President and Council are to be congratulated on getting together such a representative and interesting exhibit.

THERE were binoculars of the Wenham type, which, it will be remembered, has one body at right angles to the stage, and the other joined to it at an angle, also some Stephenson's binocular, were both bodies are at an angle, and the illumination of both fields of view are practically equal; the Nachet dissecting microscope, were a pair of eyepieces and prisms (mounted at the eye interval separation) are connected to a single tube as a T at the top; the Rousseler binocular, which had a convenient arrangement for manipulation when dissecting; and an historical binocular, by Murray & Heath, of a modification of Nachet's principle, which gave uncommonly good results. Messrs. Powell & Lealand showed what is seldom seen under binocular vision, viz., the circulation in valiscentaria; while Messrs. Watson showed a useful and interesting form of binocular, known as the "Brücke," which was designed mainly for flowers, tank use, and objects requiring low power.

A CLEVER adaptation of the Porro' principle of binocular vision was shown in Zeiss's new binocular microscope, which is fitted with two objectives as well as two eyepieces, the focal length being sufficient to permit of convergence of the two optical systems to one point of the object. The field of view was very good. This Porro system, which has so long been laying dormant, seems likely to revolutionise more branches of optics than field and marine glasses. It is strange how an optical arrangement, identical almost in every detail with that made forty years or so ago, has been resuscitated and made into a commercial success, also the subject-matter of a patent, which may or may not be a protection.

THIS system of prisms provides for the inversion of an image in a short form, and thus enables a telescope eyepiece to be used and a higher magnifying power obtained in the same space as a lower power would be with the ordinary (or Newtonian) form of binocular field glass with concave eyepieces. I remember fitting one of these inversion prisms to a single telescope fifteen or twenty years ago, to shorten the length of the instrument, and with the microscope development above described there are many possibilities of employing the system in popular optics if not as scientific research. In the collection of microscopes alluded to one would have been more pleased if greater attention had been paid to the adjustment of the Wenham prisms so as to ensure coincidence of image, and it was distinctly manifest how superior generally was the Stephenson system for obtaining binocular vision and evenness of illumination of the two fields.

G. R. BAKER.

#### A SMOKELESS MAGNESIUM FLASH POWDER.

THE flashlight powder which gives the least smoke is that which gives no ashes when burnt, beyond magnesium oxide. This is not the case with the usual mixtures of magnesium with nitrate, permanganate, or chlorate of potash, but a mixture of magnesium and ammonium nitrate should answer to the requirements, and experiments confirmed this assumption, and the development of smoke was considerably less than with the above substances.

Ammonium nitrate,  $\text{NH}_4\text{NO}_3$ , crystallises without water, but is somewhat hygroscopic; it is therefore necessary to melt the salt before use, and then to keep it, when powdered, in air-tight bottles. If it is not sufficiently dry, it does not burn quick enough.

The following mixtures were tested:—

- a. 1 part magnesium, 1 part ammonium nitrate.
- b. 1 " " " " " "
- c. 1 " " " " " "

The estimation of the illuminating power of these mixtures was arrived at with a sensitometer, with the result that *b* was equal to a mixture of 1 part magnesium and  $\frac{1}{2}$  of a part of potassium permanganate. Mixture *a* showed 2.4 times the amount of chemical activity of *c*, and the latter burnt more slowly. The rapidity of burning was generally less than with the above-mentioned mixtures of chlorates, &c., but absolutely sharp negatives were always obtained when *carte-de-visite* portraits were taken, and less powder was required.

The lens used was working at *f*-7, and the distance of the sitter was 2 metres, that of the flash powder being  $1\frac{1}{2}$  metres, and it was burnt before a mirror. On a sheet of zinc a strip of nitre paper, 5 m. long and 1 cm. broad, was placed, and the flash powder dusted on one end.

The shadow side of the sitters was lightened by paper reflectors. When the one end of the paper was lit, the exposure took place in a few seconds, and, if there was sufficient general light in the room, the eyes of the sitter appeared absolutely sharp. Focussing was effected by means of a candle at the same height as the sitter's eyes.

It was found that 0.3 gramme of magnesium, mixed according to *a* or *b*, gave fully exposed *carte-de-visite* negatives.

The development of the smoke was so little that five exposures could be made one after another, and this without trouble, and even then clouds of smoke were not noticeable.

If the flash powder be dusted on some pyroxyline or pyroxyline paper, it can be set fire to by a match stuck in the end of a bit of wood or a taper.

This smokeless flash powder ought to be useful for interior work, and, with 1 gramme of magnesium and 0.8 gramme of ammonium nitrate, a room with two windows and an area of five square metres, a sufficiently exposed negative was obtained, and the people in the room appeared absolutely sharp.

The essentials for success are absolute dryness of the ingredients, fine powdering, careful mixing with a feather on paper, and the use of nitre paper or pyroxyline.

PROFESSOR ALEX. LAINER.

Photographische Correspondenz.

#### COLOURING LANTERN SLIDES.

##### I.

WHATEVER prejudice may exist in the minds of some against the introduction of coloured slides in a lantern lecture or entertainment, there is no doubt that with the great bulk of the public such are greatly appreciated, and but few lecturers, having any practical experience of catering for the public taste, can be found who will not at once admit the truth of the assertion that coloured slides are popular with the masses, and it does not require any great stress of imagination for any one to see that, in the case of some subjects, very much of their interest depends upon the introduction of colour, notable examples of which we find in such subjects as flower studies, &c., &c. On the other hand, there is also a class of subjects that would certainly not benefit by their being represented in a coloured form—statuary, for instance, where so much depends upon the blending of half-tone, high lights and shadows, and in the original of which, no colour being present, it becomes somewhat incongruous to introduce such—although this mistake has been perpetrated frequently, even with high-class slides. Neither does it follow that any lantern lecture set must of necessity be composed entirely of either coloured or uncoloured slides, for experienced lecturers never hesitate to introduce in a set, the bulk of which are uncoloured, a few coloured pictures, the subjects of which are more particularly suitable for being exhibited in coloured form, whilst a few of such always tend to break up a monotonous series of views, and are likewise restful and pleasant to the eyes of beholders; and, so long as coloured pictures are appreciated by the general public, so certainly will their production form an important feature with lantern-slide makers.

The colouring of lantern slides is an operation that requires a considerable amount of care, and some practice is needed before any one need expect to become proficient at the work. Many years ago, or before the introduction of the now popular gelatine plate, this work had to be accomplished upon a collodion film, and, with a large number of professional makers and colourists, has still to be practised; but within recent years, among amateur workers especially, gelatine is almost universally employed in the making of their lantern transparencies, and the treatment in the case of slides made upon a gelatine base differs somewhat from that in regular practice upon collodion. No doubt, most beautiful results are obtainable by either method, even although our old workers are loth to admit that gelatine can at all compare with good old collodion in this branch of photography.



Among the great bulk of amateur workers a large number, no doubt, could be found who have, from time to time, tried their 'prentice hand at colouring their slides, and quite possibly with a fair amount of success. There are, however, certain professional secrets in this work which, if unknown to any one undertaking it, make all the difference in the world in the results produced.

In dealing with gelatine, for instance, the operation is too frequently undertaken without any, or a proper amount of, thought being bestowed upon the condition of the slide being suitable for the application of colour; and, in cases where an unsuitable condition exists in a gelatine slide, it is impossible for any one to obtain that sparkle or brilliancy which ought to form a part of all first-class results.

It has been over and over again urged that the great advantage which collodion possesses over gelatine lies in its purity of high lights, as well as a certain or peculiar cut of image, which no gelatine slide ever can be made to yield, so long as the image is not built up on the film, as is the case with the deposit which forms the image on a collodion film. The chief drawback, however, when attempting to colour a gelatine film, will almost invariably be found to lie in the absence of absolutely clear glass in the high lights; if there be any muddiness apparent, such is certain to be more or less intensified by the application of colour. Therefore, whenever this degradation of the high lights is found to be present in a slide it is desired to colour, the first step an expert colourist will take will be to subject the same, if at all possible, to some treatment whereby the high lights are made suitable for the rendering of an absolutely transparent appearance when colour is applied to the same.

There is also another very important operation in connexion with the successful rendering of coloured subjects that I have never seen any writer upon the subject refer to. Take, for instance, the colouring of a subject such as a steamer with red funnels, or various-coloured smoke-stacks. Here we are met with a difficulty which to some may appear insurmountable, by reason of the original red colour of the object when photographed being so non-actinic as to yield the appearance of the funnels being quite black in the photograph when the negative is printed, either upon glass or paper, and, when in the case of a lantern slide the same is produced without any special preparation, the deposit on the slide will be quite black and opaque; and, when to this is added any red or coloured pigment, no appreciable colour can be represented by transmitted light upon the screen, by reason of the opacity of the dark funnels. Instances of this kind, therefore, call for especial treatment, frequently entailing a considerable amount of skill and experience, which many workers do not care to impart to the public at large. In the case of collodion the scalpel requires to be frequently used to obtain particular high lights, or to provide certain portions of a picture being brought into a fit condition to yield a transparent coloured image giving a truthful representation of the original, such as would be the case in the example stated, viz., a steamer having bright vermilion-coloured funnels. With a gelatine base the scalpel cannot be employed with success, by reason of the walls of the gelatine being so much deeper than those of collodion, so other means have to be provided to produce the high lights in view of the objectionable opacities. With gelatine an instance of this kind is best treated by working upon or doctoring the negative, whereby, instead of the same yielding a slide with black funnels, the same will print this portion of the steamer as clear glass. To accomplish this, the funnels in the negative must be blocked out with a suitable opaque medium, such as burnt sienna; but bear in mind, in doing this, so as not to injure the negative, or to make it at all unsuitable for regular printing, after the slide has been made, that only oil colour be used for such blocking out. When oil colour is used on the film side, a rag steeped in turpentine will remove any trace of such treatment, and leave the negative uninjured. Other instances will be met with, such as when no negative can be obtained, in which case such treatment has to be communicated by an extremely delicate operation of reducing the opacities on the face of the slide itself by one or other of our well-known reducers, such as ferricyanide of potassium. For successful results, the obtaining of these high lights so absolutely clear as will permit of a bright transparent condition being secured is the first necessity in lantern-slide colouring, and no one need attempt to become a successful colourist, or produce coloured slides of really first-class quality, that does not grasp the necessity of having this groundwork to operate upon, both in gelatine and collodion. But, whenever this keystone of the bridge is passed, then lantern-slide colouring becomes a matter requiring ordinary patience and cleanliness to accomplish satisfactorily, once a knowledge of the necessary colours and tools to use is obtained. T. N. ARMSTRONG.

#### JUDGING A LANTERN-SLIDE COMPETITION.

A CONTEMPORARY says, "It was no easy task for two gentlemen who kindly acted as Judges to patiently sit for some hours in order to make their awards."

In a dark and dismal chamber beneath the boards whereon the editorial chair reposed in the odour of sanctity: we sat. It was a drear December day, and the fitful light of the fading sun was dimly reflected

through the prismatic pavement above us, but a ray of shining comfort glowed in a distant fire made for our especial benefit, and we clapped our hands and stamped our feet on the concrete floor in sympathy with burning embers as we waited the magic light being thrown upon the sheet which, I may here remark, had been borrowed from the office-boy's mother for the occasion.

There were two of us, and the editor, whose kindly thoughtfulness had supplied our minds and stomachs with good feelings and good fillings respectively, in anticipation of the coming events that were to cast their shadows upon the screen.

The wintry wind wearily whistled down the unprotected stair, the man with the George Lewis fur-liner smiled the smile that was childlike and bland, the staff of the outer office, who came down to assist in the show, turned down their trousers to keep their ankles warm, and turned up their coat collars to keep the cold from their necks, but the chief merely stroked his hair.

We were obliged to sit in this chamber because it was dark and big enough to hold the lantern, and so show the pictures properly. Around us on every side were stacks of slides in boxes sent by competitors, and all was ready to begin. The chief turned on one or two little taps, and adjusted the lime light that hissed loudly; but this was nothing to the hissing sound that escaped the editor's lips a moment or two later, for he had, whilst stopping to regulate the light, forgotten the existence of a small gas jet (which was for use in case the electric light failed) in close proximity to his head. First there was a little hissing sound, as I have said, from the lime light, then a slight frizzling noise, and a smell of something burning; then there were a few "cursory" remarks upon swearing, edited by the lanternist, and which were carefully treasured by his tittering staff for future use in case of emergency, new and original anathemas being now at a premium.

By this time we were on the tiptoe of expectation, and fearful lest something untoward might happen. I had a premonition of various disasters ere we started, and I am quite convinced now that I have mistaken my vocation, and ought to have been a professional clairvoyant. The first interruption came about like this: The second slide had scarcely slid slowly in the slot, and shone upon the screen—I mean screen—when my colleague interrupted the proceedings by informing me that I had wrapped my feet in his *Morning Advertiser*, and that he was anxious to preserve it, as there was a particularly fine piece of alliteration in it. After I had returned his paper, the judging proceeded, and I will try and describe some of the scenes that we saw and think, in ink, the thinks that we thought.

The competition was divided into the usual number of classes, but those that particularly appealed to me were the Animal, Figure, and Portrait series.

The Animal class came first, and, that unlucky second slide having departed, all went merry as a modern musical play until there flashed on the screen a splendid picture of a long-eared critic of the *Weekly Thistle*. There was silence for a moment; the editor moved his head in our direction, as much as to insinuate, almost in the words of Macbeth, "When will you three meet again?" when the quietude was broken by the dulcet accents of the office boy (who had evidently forgotten for the moment in whose presence he was), saying, in a voice of agitated interrogation, "When is a Scotsman like a donkey?"

The rest of the staff were struck dumb with amazement at the boy's audacity, and, as no sound escaped us, the irrepressible urchin answered his own question *sotto voce*, but with triumph in every syllable, "When he stands on his banks and braes." There is now a vacancy in the outer office, and the Manager, and the Assistant Manager, and the Assistant Manager's assistant are exercising their ingenuity to concoct an advertisement for the front window.

They showed me, later on, their attempt in this direction; here it is: "Wanted, immediately, an office boy. No amateur photographer eligible. One who is deaf and dumb preferred."

I suggested that they should add, "No boy who can whistle need apply." I know it would be a little awkward to have to write directions for a deaf-and-dumb boy, but look what a few mistakes he would make in comparison to other office boys, and what a comfort to the neighbourhood he would be—only just fancy it, an office boy who could neither talk nor whistle! Ye gods! 'Tis a consummation devoutly to be wished."

After the office boy had been kicked by the various managers and their assistants, and his remains buried in the coal cellar, we proceeded. The next picture of note that I can remember was that of a man and a cow. I forget the name of the subject, but I know the cow had her tongue out and was licking the man, and it recalled to my wandering wits the old nigger minstrel story of the wonderful sagacity of animals. It was a story of a cow who had lost her calf, and a man found it and took it back to her, whereupon the cow turned to the man and licked him (an *l* there, Mr. Printer, please, not a *k*, it makes a lot of difference to the story). Brother Bones No. 1 said that was an example of the sagacity, the gratitude of the cow. Brother Bones No. 2 disputed it, saying it was not gratitude at all, there was no sagacity about it; the cow had only licked the man because she thought he was her calf—a case entirely of mistaken identity; and the slide above referred to reminded me very vividly of this tale, which, by the way, is not quite



new, as I last heard it told by my father to my mother over my cradle in the dim and distant distance.

The show shone on, and there were pictures of all kinds of animals, from the elephant to the flea. The "elephant" slide came just before the last-named, and, when it disappeared rather quickly, there was a rumbling noise near the coal-cellar door, and a cheery voice was heard in mild remonstrance. It was that office-boy again. He had bored a hole with his corkscrew knife through the door, and was having a fine view at the show in spite of us all. His remark here was more expressive than polite; he said: "Who are you shovin'?" as the elephant said to the flea. As the little urebin was rather dirty, they ducked him in the editor's hypo bath, and he went home a sadder and, let us hope, a wiser and better boy. We indulged in soda of another form during his washing process.

Other slides represented a sweet little maid in deep conversation with a beautiful pony, whose soft eyes plainly said "Sugar." A monkey, who had evidently taken out a search warrant to permit him to investigate the state of his master's spirit cabinet—he (the monkey) was leary and bleary, and presumably "beery" also.

There was a remarkable picture of two dear little dicky-birds sitting on a stile, so close together that you could not tell 't'other from which, they looked exactly like Siamese Twins. And then there was the sailor and the parrot, not the one dear to our nursery days. This sailor was evidently teaching the parrot to swear; you could almost see the painful profanity dropping from the parrot's beak, so wicked did it look.

By the way, in the Architectural class there was another parrot, which had quite a startling career, through a series of slides. [N.B.—This story has been copyrighted, as I had reason to believe that the editor of a contemporary, who has several speeches to make at a certain dinner next week, was about to crib it.]

The scene was laid in a country house. The curtains were closely drawn in a snug little room; the rain could be heard pattering against the window pane without, and the flickering blaze of the firelight disclosed, in slide No. 1, a parrot asleep in its cage in the window, and a terrier slumbering peacefully on the hearthrug. In slide No. 2 the parrot had evidently woke up, and was considering things in his wise way, came to the conclusion that things were a bit flat, and, catching sight of the terrier, according to the note on the margin of the slide, ejaculated "Rats, doggie; rats!"

The next picture showed the dog rushing about the room (oh, for the cinematograph for this subject!), evidently in search of the intruding rodent, which, however, was conspicuous by its absence.

Slide No. 4 shows a snarl on the face of the tiger—I mean terrier, as it subsides once more into slumber, and the parrot bides a laugh by putting its head under its wing.

Slide No. 5 is a repetition of No. 4, but the dog is not having any, and the growl only is visible on his face, and pain on the face of the parrot.

No. 6 shows us the parrot descending from its cage.

No. 7.—It reaches the dog, and stealthily bites its ear, saying, at the same time, "Rats, doggie; rats!"

No. 8 shows us a bundle of feathers all stained with blood on the hearthrug, with these words on the margin: "Parrot (*log*):—'I know what's the matter with me. I talk a darned sight too much.'"

The landscape school now hove in sight, and the beautiful pictures reminded me of those expressive lines of Mr. Shakespeare-Bacon, when he wrote:—

"Slowly sliding on the sheet,  
Slush and snow, and landscape sweet;  
Wishy-washy things were few,  
Tho' we looked 'em thro' and thro'."

The landscape series distinguished itself by one slide alone. It represented something like a desert island, with the figure of a man, whose costume was more picturesque than useful, reclining on the seat with which nature had endowed this uninhabited island. The glorious sun was silently sinking to sleep in the west, and illumined the wreckage that was strewn around. Numerous casks were there, with these strange devices upon them, XX and XXX. The scene was well arranged, but there were two deficiencies: first the title was all wrong. It was called *The Widower*, suggested by the strange story of Bluit le Boosemon. It was, no doubt, well meant, but who would have thought that the operator would neglect to block out the brewery and chimney in the distant offing?

Speaking of a chimney reminds me that we were allowed to smoke certain fragrant weeds provided by "the House," but more, I think, as a disinfectant against any malarial microbes that might lurk hidden in the dark corners of the cellar, but I am quite sure none could survive the smell of those cigars; in fact, one of the staff, after three puffs, suddenly recollected that he had a message from his wife to the chemist close by, and we saw him not again that day.

Now I will pass on to the port and figs, or, to be more explicit, to the portraits and figures. The first portraits showed us that the instincts of maternity were prevalent amongst the photographic lanternists, the picture of mamma-in-law with the son and future prop of the amateur's declining days in her arms smiled benignly upon us. Now, when a man marries, he usually has a magnificent portrait of his mother-in-law in the most conspicuous place on the drawing-room mantelpiece. If

he is a photographer it is taken by himself, but he gets wiser in time when the ties of kinship become the knots of dissension. After a little time the photograph gets put in a less prominent place, till ultimately it is discovered either on the rubbish heap in the back garden or in the lumber room, and when the latter is turned into a nursery the photo is given to the baby to help cut its first tooth. Such is the decline and fall of the maternal relative once removed.

You will say, reader, in your own mind, What has all this got to do with photography? I reply, "A lot." People who go to all the trouble and expense in arranging lantern-slide competitions do not want portraits of other people's families and babies, and mothers-in-law, and sisters, and cousins, and aunts in inartistic groups, with big feet and hands and fat white faces that look like pieces of paper with dots for eyes, nose, and mouth, the inevitable results of amateur "group" photography. These things are interesting to the people themselves, but cannot be tolerated in a lantern show.

Then we had the portrait of the artist's old flame, called by Kipling Helen Blazes: and she looked it. The light went out when the smile of a nurse flashed on the screen. She was holding the inevitable son and heir, and her expression was "frequent, and painful, and free," as Bret Harte says, and you could imagine her saying to her infantile charge, "Cough it up, ducky."

We finished up by two marvellous pictures of lightning from America, and even the electric meter in the cellar was palpably disturbed during these exhibits. They got a special medal, and, had you seen them, you'd say they well deserved it.

ST. MARTIN LAMUS.

## LANTERN SLIDES AND SLIDE-MAKING.

[Paper read before the Sixteen Photographic Club.]

I do not think that the subject of lantern-slide making needs any defence, for, although some extreme photographic artists deny that a lantern slide can be a picture, it is a hobby from which a great amount of pleasure can be obtained, and which exercises an increasing fascination over those who practise it.

I propose this evening to confine my remarks to the treatment of gelatino-chloride and bromide plates, as, among amateurs at any rate, they are used to a much greater extent than any of the other processes, and results may be produced equal to the best that can be obtained from collodion.

I suppose that the great majority of photographers use a hand camera, either alone or in addition to one of larger size, and these have an advantage in the ease with which they can make lantern slides from their small negatives. I do not mean to say that these negatives would not often make a better picture if reduced; but, if the contact method is alone used, pleasing slides may be produced from a large proportion of them.

### REDUCTION OR CONTACT.

Opinions are very much divided as to the superiority of slides made by reduction in the camera over those made by contact. One argument against the latter is that the glass used for plate-making is sometimes not absolutely flat, and therefore it is impossible to obtain perfect contact, resulting in a slight loss of sharpness in the slide.

I believe that this objection is more theoretical than real, but the difficulty can, to a great extent, be got over by exposing at a greater distance from the source of light, and avoiding side reflections by placing the printing frame at the end of a deep black-lined box. In ordinary slide-making, however, it is quite unnecessary to do so. For dark tones, I think gas is the best illuminant, except, perhaps, for very dense negatives, when magnesium ribbon may be used. In making a slide from a negative with great contrasts, expose much closer to the light than usual, about six inches from gas or one foot from the magnesium, and give a rather full exposure; by this means it is often possible to obtain presentable slides from very hard negatives; thin ones, on the other hand, should be printed from a greater distance, and, if very thin, a rather weak light should be used, of course increasing the time of exposure accordingly. With thin and flat negatives, however, over-exposure must be avoided, as greater contrast in the slide is to be aimed at. For warm tones the exposure must be greatly increased; from four to eight or ten times that required for blacks may be given, the warmth of colour increasing with the length of exposure, and magnesium ribbon should be used except in the case of very weak negatives, when gas will give a better result.

For reducing by daylight the simplest apparatus is a board with a frame at one end to hold the negative. A quarter-plate camera is adjusted at the requisite distance, and fastened with the tripod screw to the board, and, if a narrow slot is cut in the latter for about half its length, the camera can be moved nearer or further from the negative, according to the amount of reduction required. The whole is pointed towards the sky and the exposure made. It is rather difficult to give an estimate as to the time required. At this time of the year, on a bright day, with a fairly quick-printing negative, using Thomas's plates, reducing from whole-plate with the lens working at f-11, about  $\frac{1}{2}$  minute would be enough for a black-toned slide, and for brown tones 5 minutes or more according to the colour wanted. For reducing by artificial light, a lantern with a con-



denser of sufficient diameter to cover the whole of the negative is certainly the most convenient system; but, as there are not many who have one large enough for half-plates, and still fewer for the larger sizes; there are other methods by which reduction by artificial light can be carried out.

One way is to place a piece of ground glass about three inches behind the negative, and to pass a strip of burning magnesium ribbon backwards and forwards, and up and down, at an inch or two behind the ground glass, taking care to make the illumination as even as possible, the amount of ribbon used depending on the density of the negative and the colour required in the slide.

Another way, and, if time is not much object, perhaps a better, is to place an incandescent gas burner, or a good lamp, on each side of the negative, just far enough back to prevent the rays striking the glass. A piece of white cardboard, or ground opal, is then stood up in the position which will best reflect the light through the negative and give the strongest and most even illumination. Very good results may be got in this way, but the time required is rather long; for brown tones, with the lens at  $f/11$ , about 20 minutes will be necessary for an average negative on Thomas's plates.

The usual definition of a perfect slide is that it should be clear glass in the high lights, and that there should be a regular gradation of density in the shadows, which must not, however, be quite opaque in the darkest parts. I think that the amount of clear glass should be very small, and, in fact, it is often an advantage to have a slight veil even over the highest light, giving a softer and less glaring effect. It must be admitted, however, that at many lantern shows the brilliant slides, and those showing the greatest contrasts, are often preferred by the "audience" to the softer and more pictorial ones.

#### SKIES.

Years ago it was the fashion to produce slides in which the sky was represented by an expanse of white, without clouds or shading, but fortunately taste has changed, and we do not see so many views on the screen with the blank skies of former days. In printing in clouds several things must be considered. I am supposing that there are no printable clouds in the negative. There is often a temptation to use a sky which has contrasts much greater than the landscape it is supposed to belong to, and the effect is usually very disastrous. I show you here an example of how it should not be done. Care must also be taken that the sky and the view are both lighted from the same direction, and that they meet properly at the horizon. It is also an advantage if the lines of the clouds can be made to balance the lines of the landscape. I think it is better to err on the side of lightness rather than too great density, for except, perhaps, in some open landscapes and sea pictures, the view is the most important part of the slide, and the clouds should not be so prominent as to distract attention from that portion. If it is not proposed to have clouds in a view, and the sky part of the negative is even and free from markings and not too dense, it is a good plan to let the sky in the slide veil over considerably. Directions are often given to remove the plate from the developer as soon as the high lights show any signs of veiling; but I think that, if the sky is slightly darkened all over, the result is greatly superior to an expanse of bare glass.

Many people have very exaggerated ideas of the difficulty of printing clouds on lantern slides. By careful masking they may be printed on the same plate as the view, but there is some difficulty in timing the exposure so that the whole slide will develop equally. A far easier plan is to keep the sky part of the view clear glass, and to print the clouds on a separate plate, which is afterwards used for the cover glass. In working this way it must be remembered that the clouds are viewed through the glass instead of the usual way, so that, in choosing the cloud negative, it must be looked at from the film side for the direction of the lighting, &c. The lantern plate and slide should be held, back to back, up to the yellow light, and the limits of the view marked with a pencil on each edge of the lantern plate, a line on the film about  $\frac{1}{8}$ -inch long is sufficient as a guide. The plate is then placed in the printing frame in contact with the cloud negative, and the lower portion masked off with a folded cloth, keeping the line of the view as nearly as possible, the marks on the edge of the film showing the amount of the plate that must be covered. It is advisable to give the part near the horizon rather less exposure than the upper part receives, by moving the cloth slowly up and down for a short distance. The time of exposure requires some care, or the clouds will develop with a different tint than the landscape, and that is the chief drawback to this method. Should they appear too warm, they can be slightly toned with gold, which will often bring them to the right colour, taking care to stop toning before they are quite cool enough, as the tone is colder when dry.

After development and fixing, the cloud slide and the view are held back to back, and any part of the cloud projecting over the landscape is cleared away with reducing solution, applied with a small mop of cotton-wool or a soft brush, and with a little care a very exact joint can be made. If the clouds have been over-developed they can easily be brought to proper density with the reducing solution, and the lower portion lightened if necessary, but be careful to avoid over-reduction, as the solution acts rather quickly on weak prints. The reducer used with a brush can also be locally applied to any part of the slide which is too much veiled, or which has acquired too great a density. I may mention here that the perchloride of iron reducer is not suitable for warm-toned slides on

bromide plates, as it changes the colour to a blue tint, but Howard's Farmer's ferricyanide and hypo reducer will do all that is required.

#### MASKING.

It is surprising sometimes to see how little consideration is given to the masking of slides. You may occasionally, at a lantern show, see a number of slides exhibited by some one who has apparently purchased a box of assorted masks, and who feels bound to use them all up before buying another. Some of them may suit the views, others certainly do not, but the box must be finished. Beginners often make the mistake of using too large a mask, they do not like to sacrifice any part of the plate they have just developed; but there are really comparatively few instances in which the whole of the slide can be shown to advantage, it is nearly always better to cut off part. I am only referring here to pictorial subjects, and not to scientific slides, which, of course, will often require the whole of the plate. I think that by far the best shape is the oblong, with square, and not rounded, corners; the latter do not give nearly such a pleasing effect on the screen. Round, oval, square, and dome-shaped masks are useful for classes of subjects such as microscopic work, still life, some portraits, &c., but they are only occasionally suited for landscapes.

The colour of the slide should also receive some consideration. Warm brown or red has a curious effect if used for snow or frost studies, these are cases for black or grey tones. Architecture, or at any rate interiors, is usually more effectively rendered in not too warm colours. I must own to preference for brown tones myself, which I like to use when possible; but, after all, the colour is chiefly a matter for individual preference.

#### CHLORIDE PLATES.

Whether warm or cold tones are used, however, it is a good plan to have a few of the less-favoured colours interspersed among the others, so as to break the monotony in a long series of slides.

Among dry-plate workers chloride plates are often used for making slides by contact, both on account of the great latitude allowable in exposure and the long range of colours obtainable. The chloride film is more translucent than the bromide, and is of a salmon colour when held up to the light, and one very noticeable characteristic of slides made on these plates is the remarkable transparency of the shadows.

Although chiefly used for contact work, they are quite suitable for reduction in the camera with a rather prolonged exposure. To produce a warm brown tone, an exposure of about twice as long as would be given to a Thomas's plate for the same colour would be necessary. For contact work the best illuminant is magnesium ribbon, as by ordinary gaslight the exposure is rather prolonged; an average negative would need about three minutes at six inches from the burner.

Another point of difference between chloride and bromide plates is that for the former it is not necessary to alter the developer according to the colour required; it is entirely dependent on length of exposure. With the same developer a series of tones can be got, ranging from greenish-black through various shades of brown to a bright red. To obtain a very deep red, however, I think it is better to considerably restrain the developer by adding two or three grains of potassium bromide and ammonium carbonate to each ounce; I am supposing hydroquinone to be used as it is generally recommended, and for chloride plates is preferable to pyro. The developer is used in a more diluted form than for bromide plates and with less accelerator. The Ilford Company give a good one on their Alpha plate boxes; or, if the Ilford universal hydroquinone developer is used, take one part of the quinol solution, half part soda solution, and two parts water, and with this developer and various exposures almost any colour can be got. If black tones only are wanted, amidol or metol will give a better colour than hydroquinone. I have heard it stated that one of the great charms of Alpha plates is the pleasing uncertainty of the colour to which the slide will develop. This is to some extent true when commencing the process, but with very little experience there is not much difficulty in judging the correct exposure for the tone required. In any case, so long as sufficient exposure has been given, it does not much matter if the slide is considerably warmer than is wanted, for chloride plates are especially suited for toning with gold. They may be toned in separate baths or in the Ilford combined-toning and fixing bath; I prefer the latter, and it is not liable to double-toning. The brightest red can be gradually changed to brown, black, or blue, the latter requiring a considerable time in the toning bath.

One advantage of these plates is the amount of light that may be used when developing; it is only necessary to have yellow glass in the lamp for judging density, and there is no harm in having an unprotected light in the room if care is taken that the direct rays do not strike the plate before it goes into the developer. They are especially useful for slides of flowers or still life, and for some landscapes, but are not so generally used as their merits deserve.

#### BROMIDE PLATES.

There is no doubt that the great majority of amateur slide-makers use bromide or chloro-bromide plates. I should think it is no exaggeration to say that they exceed all the others put together. Most makers supply plates of two rapidities—rapid for black tones and slow for warm tones. With the rapid plates very pleasing brown colours can be obtained with a long exposure and restrained developer, and the slow series will give



good warm blacks with a short exposure and quick development. For pure cold blacks the newer developers, such as metol, amidol, and rodinal, give the best results; hydroquinone also gives a good colour, and pyro may be used where rather more warmth is preferred. The solution for developing slides must be weaker than that used for negatives, generally about half the strength, and with most plates the development must be carried further than appears necessary in the unfixed slide, as the hypo bath often has an apparently reducing effect. Any slight veil over the sky and high lights will be hardly visible when the slide is fixed, and can usually be ignored. With the newer developers a rather shorter exposure should be given than when using quinol or pyro; a full exposure is very likely to lead to considerable veiling of the lights with a consequent over-flattening of the slide. A safe guide in the choice of a developer is to use the one recommended by the plate-maker, but I find that an average developer will suit most of the kinds of plates that I have tried. The great thing to learn is when to stop development. It is not a thing to be learned from books or verbal instruction, but comes with practice. There are far more plates spoiled after they go into the developing dish than by the exposure, and among beginners, at any rate, the fault is in not developing long enough.

The production of brown tones is dependent on long exposure and restrained development; the longer the exposure and development, the warmer is the tone.

#### DEVELOPMENT.

The favourite developers for these colours are hydroquinone and pyro, used with the addition of considerable amounts of bromide and sometimes ammonium carbonate. For my own use I prefer pyro ammonia. Thomas's old formula, made up of pyro sulphite ten per cent. solution, 30 m.; ammonium bromide,  $4\frac{1}{2}$  grains; ammonium carbonate,  $4\frac{1}{2}$  grains; ammonia, 8·803 m.; water to 2 ounces; for redder tones more bromide and ammonium carbonate is added, with, of course, increased exposure.

There is some difficulty at first in judging the depth to which development should be carried, and it varies greatly with the make of plate used. The appearance of a fully developed Ilford special plate treated for brown tone would be quite different to a Thomas's plate developed for the same colour. The Ilford plate should look rather weak, and the other make fully dense; in the first case you have a bromide plate, and in the other, I believe, a mixture of chloride and bromide emulsion; but, as I said before when speaking of black tones, do not stop development too soon, for the richness of the colour depends largely on the time required to obtain density, a slide that has developed too quickly is often a poor and rusty-brown colour. A good slide will often take 10 minutes or more, and, if the acid fixing bath is used, it will clear away any slight stain there may be from the pyro. With hydroquinone there is no fear of staining, and the same developer may be safely used for two or three plates; but care must be taken that the exposure is sufficient, or there is some risk of the slide being rather hard, the colours obtainable are very good.

Thomas's is a useful formula, and is as follows:—

#### No. 1 SOLUTION.

Hydroquinone .....	160 grains.
Sodium sulphite .....	2 ounces.
Citric acid .....	60 grains.
Potass bromide .....	40 "
Water to .....	20 ounces.

#### No. 2 SOLUTION.

Sodium hydrate .....	160 grains.
Water to .....	20 ounces.

For black tones take  $\frac{1}{2}$  ounce of each and 1 ounce water; for brown, add  $1\frac{1}{2}$  grain each of ammonium bromide and ammonium carbonate, and, for warmer tones, increase the amounts up to 9 or 10 grains of each to the 2 ounces of developer; the full amounts of restrainer will require a very long exposure—about five or six times as much as would be given for a rather cold brown, and will probably take a quarter of an hour to develop. In very cold weather it is advisable to use a little warm water in making up the developing solution, as many developers act very slowly when very cold; pyro is, however, to a large extent an exception. If a slide gains density very slowly in cold weather, it is a useful but unscientific dodge to rest the dish on the top of the dark-room lamp for a minute or two so as to raise the temperature slightly—I have often saved slides that way. If you are developing a slide to a brown tone, and through under-exposure it will not come out properly, and only appears as a ghost, pour the developer off, and pour  $1\frac{1}{2}$  or 2 ounces of water into the dish, cover it from the light, and leave it to develop in the plain water for a quarter of an hour or so; if you look at it then, you will probably find a nearly fully developed slide. The colour will not be quite as good as if finished in the ordinary way, but will be quite presentable, and a plate may often be saved in this way which would otherwise have been cleaned off for a cover glass.

#### TONING AND FIXING.

For fixing, either a plain or an acid hypo bath may be used. I prefer the latter myself, as it is of great assistance in removing any possible slight stain after pyro development. The formula is: Water, 20 ounces; hypo, 5 ounces; soda sulphite, 1 ounce. When dissolved, add while stirring vigorously 1 drachm sulphuric acid.

For thorough fixation the slide should be left in the solution two or three times as long as it took to clear, and is then examined for density, colour, &c. If it is not all that it should be, or at any rate only very slightly faulty, the very best remedy is to make another; but, if the colour is satisfactory and the fault only a little too much density, it may be reduced. A good reducer is Howard Farmer's, consisting of 10 per cent. solution hyposulphite of soda, with sufficient ten per cent. solution potassium ferricyanide added to turn it a pale yellow. The action must be watched carefully, as, if too much of the ferricyanide has been added, it is very rapid, and immediately the reduction is sufficient the plate must be well washed in running water. For washing after fixation I think two hours in running water is quite sufficient, and the best form of washer is one in which the water is continually passing over the plates. When the washing is finished, each slide should be given a good final rinse under the tap, and, while the water is running over it, the surface is mopped with cotton-wool or gently rubbed over with the fingers to remove any particles or grit which may be adhering to the gelatine, they are then stood on edge in a warm place, well protected from dust, to dry.

If the slide appears of too warm a colour, it can easily be toned with gold. The Alpha bath is simple and effective. The formula is:—

Hyposulphite of soda .....	2½ ounces.
Acetate of soda .....	1 ounce.
Ammonium sulphocyanide .....	1 "
Gold chloride .....	4 grains.
Water .....	10 ounces.

The salts are dissolved in the water in the order given, and the bath will keep for a considerable time in the dark. In toning from brown-red to brown, the slide must be removed and washed as soon as a slight perceptible toning action has taken place, as the colour is much colder when dry; for a black, the toning must be stopped while the slide is still brown-black; for a bright blue, it may continue until a decided blue colour is obtained, which will be more intense after drying. With this bath slides may be fixed and toned at the same time or may have been fixed and dried previously. The sulphocyanide bath may also be used, but much stronger than for P. O. P. The formula is:—

Water .....	1 ounce.
Ammonium sulphocyanide .....	20 grains.

When dissolved, add slowly—

Chloride of gold .....	1 grain
in Water .....	1 ounce.

Before toning with this bath the plate must be well washed to remove the fixing solution.

To tone slides from black to brown, uranium nitrate is used. The formula is:—

Uranium nitrate .....	1 grain.
Potassium ferricyanide .....	1 "
Glacial acetic acid .....	15 minims.
Water .....	1 ounce.

With this solution a black-coloured slide can be toned to various shades of brown and finally to red; the toning should be carried slightly further than the colour required, as there is some reduction of colour in the final washing, which should not be continued longer than is necessary to remove the yellow stain from the clear portions. The slide should be rather lightly developed, as uranium toning has also an intensifying effect. These colours can be changed to green or blue by immersing the toned and washed slide in a weak iron solution, i.e.—

Strong solution perchloride of iron .....	2 minims.
Hydrochloric acid .....	4 "
Water .....	10 drachms.

As soon as the shade of green or blue wanted is reached, the slide is at once washed for five or ten minutes and dried. On removing uranium-toned slides from the washing water they should be gently dabbed over with a pad of soft cambric, free from dust, to absorb as much of the moisture as possible, otherwise the colour will run and spoil the outlines. They are then dried, and, I think, will be found quite permanent.

A. P. HOOLE.

#### INTERNATIONAL LANTERN-SLIDE EXHIBITION.

THE Committee of Administration of the Association Belge de Photographie have decided to open this year an international competition for lantern slides. The rules will be published next month, but, provisionally, three classes have been decided upon: Artistic Photography, Scientific Photography, and Architecture. In each class there will be silver-gilt, silver, and bronze medals placed at the disposal of the Judges for the best set of twelve slides. Slides may also be sent for exhibition only. The competition will close on October 31, and the slides must be left in the hands of the Association till the end of February 1900, in order that they may be shown before the seven sections. The slides must be either of the size determined by the International Congress,  $8\frac{1}{2} \times 10$  cm., or else of the English size. The rules may be obtained on application to M. Vanderkindere, 97 Avenue Brugmann, Brussels.



## STEREOSCOPIC EFFECT ON THE SCREEN.

THE latest device with this object is due to Dr. G. R. Wilson, of Loanhead, who, in carrying it out, proposes to obtain series of photographs of moving objects, taken from different points of view, after the manner of stereoscopic photographs of stationary objects. The cameras employed are cinematograph cameras so arranged and geared together as to operate synchronously, and to produce two or more series of pictures simultaneously.

These cameras will be geared together by chain or other suitable gearing, or they may be driven by a common motor with simultaneous stops, that is, with an electrical or other mechanism which will ensure that the two or more cameras keep exact time. The negative, film, or strip in each camera so used, and the shutters, which alternately admit and exclude the light, will work synchronously, so that in any given time each camera will take exactly the same number of photographs as the other camera or cameras.

Dr. Wilson proceeds: The negatives from this stereoscopic cinematograph camera or cameras will be printed on cinematograph slides, films, or strips. I may print the corresponding images on one slide, film, or strip, side by side, or I may use separate films or strips.

The slides, films, or strips, I cause to be run through sister lanterns placed near one another, so arranged that the images projected from the two or more lanterns are superimposed, or approximately so, upon a screen.

The lanterns used will be some form of cinematograph lantern, that is an optical or magic lantern having a mechanism by which the slide, film, or strip bearing the successive pictures, is rapidly passed in front of the light, so that the pictures are projected on the screen in rapid succession.

As the cameras were geared together so as to obtain simultaneous negatives, so the cinematograph lanterns will be geared together so as to throw the corresponding pictures simultaneously upon the screen.

Each cinematograph lantern will be geared to each of the other lanterns; or they may be driven from a common motor. I may use ordinary chain gearing, so that each link in the gearing chain will pull upon a tooth or a toothed wheel, so as to revolve it through a definite arc of a revolution; or I may use an electro-magnet, which, by establishing connexion with the driving wheels rhythmically, will stop the revolutions of the several lanterns coincidentally and at regular intervals; or I may employ other means for driving the lanterns synchronously.

Instead of using separate cinematograph cameras I may use a double, triple, quadruple, &c. camera, with cinematograph adjustment, that is, a camera capable of taking more than one series of pictures simultaneously.

Similarly, instead of separate lanterns, I may use a double, triple, quadruple, &c. cinematograph lantern to project the different series of pictures.

Pictures so projected would appear blurred upon the screen, and would give no stereoscopic effect unless differentiated in some way in the lanterns, and again resolved by some device in front of the eyes.

Into each cinematograph lantern, therefore, I introduce an apparatus for polarising the light, such as was described by Anderton in the specification of his patent for stereoscopic lantern, No. 11,520 (1891); or I may use differently tinted glass or other screens; or I may use some other method for differentiating the superposed pictures projected from the separate lanterns or lenses on to the screen, which I prefer should be a grooved or striated silver screen, but which may be some other kind of screen if desired. For inspecting the images thus differentiated on the screen by polarisers, tinted glasses, or other means, the spectator is provided with analysers or other instruments, which analysers may be polarisers (see Anderton's patent above mentioned), corresponding in their effect with the effect of the polarisers in the lantern, or they may be hand screens so tinted as to correspond in their effect with the effect of the tinted screens in the lantern; or they may be some other kind of instrument to correspond with another kind of differentiation in the lantern. The effect of the analysers or corresponding instruments will be to convey the separate images differentially to the separate eyes, so that the data for a stereoscopic image will be presented.

Instead of superimposing the double, triple, &c. images on the screen, I may project them side by side upon the screen or otherwise, and, instead of using a hand instrument which will analyse two or more images superimposed on the screen, I may use instruments which will analyse images projected adjacently on the screen.

It may here be remarked that the slides prepared as above explained may, if desired, be passed through a kinetoscope, and viewed with stereoscopic glasses therein, in lieu of projecting the pictures on a screen.

This arrangement, however, is not suitable where a company is assembled for viewing the pictures.

## THE BIOGRAPH IN THE VATICAN.

UPON the announcement of the recent illness of Pope Leo XIII., it was found that with one exception no authentic photograph of the Pope had been taken during the past six years. Within a few months, however, no less than 17,000 photographs of the Pope have been taken with his sanction. These photographs were taken in the loggia and gardens of the Vatican with the aid of the Biograph camera.

Mr. William Kennedy-Laurie Dickson, representing the Mutoscope and Biograph Syndicate, Limited, of London, England (the English connexion

of the American Mutoscope Company), went to Rome for the purpose of obtaining moving photographs of the Pope. He had credentials from Cardinal Gibbons, Monsignor Martinelli, Archbishop Ireland, and other noted prelates in the United States, and by special permission of the Pope he secured nine series for the Biograph and Mutoscope, and these scenes were exhibited on December 14, at Carnegie Music Hall, New York City, in the presence of Archbishop Corrigan and other distinguished clergymen of the Roman Catholic faith. They had previously been shown to Monsignor Martinelli in Washington, and given his approval.

The moving views, says the *Scientific American*, show the Holy Father walking and riding in his carriage and sedan chair about the halls and gardens of the Vatican, and in some of these scenes the Pope is seen bestowing his blessing upon the bystanders. He is also seen walking about the garden and sitting on a rustic bench surrounded by some of the chief members of his official household and the Garde Nobili. The views certainly bring us into a more intimate relation with one of the great figures of the closing years of the nineteenth century. When Mr. Dickson was taking the photographs, the Pope asked for an explanation of the apparatus. A copy of the *Scientific American* containing an article on the American Mutoscope and Biograph, published on April 17, 1897, was shown him. His Holiness became much interested in the paper.

The laboratory of the International Mutoscope and Biograph Syndicate, where all of the moving-picture apparatus is developed and prepared for the market, is at Canastota, New York. At this laboratory there are employed a large force of inventors and mechanical experts under the direction of Messrs. Marvin & Casler, and constant efforts are being made to develop new and improved forms of moving-picture apparatus, and to discover new methods of taking and exhibiting moving-picture views. All the intricate and special machinery involved in the process of reproducing these views with marvellous exactness is designed and built at this laboratory, and this work requires great mechanical skill and the most perfect tools and appliances known to the mechanical art. The accuracy of this class of apparatus will be better appreciated when one considers the enormous magnification at which these views are projected upon the screen, and the rapidity with which successive views must follow each other in perfect registration. Imagine a sequence of two thousand pictures, each two inches by two and a half inches in size, following each other in turn through the projecting lantern of the Biograph every minute, each picture being magnified on the screen to a size of twenty by twenty-five feet, and think how perfect must be the registration of each surrounding picture in order that the result of the image upon the screen may not appear to dance about and vibrate, but may appear as one continuous set picture! Not only is precision in projection required, but also in the printing of the positives from the original negative. The negative prints taken by the original camera do not always follow each other at equal distances upon the strip of film; consequently, in printing the positives, the printing machine must be able to correct this imperfect spacing and produce a band of positive prints printed perfectly equidistant. The printing machine must also be able to properly register and print bromide pictures from the same negatives, but these pictures on a band of bromide for the Mutoscope have to be spaced much wider than when printed on celluloid strips for the Biograph. The printing machines are arranged to run entirely automatically, and so perfect is their design, that, if for any reason a print does not register perfectly, the operation of the machine stops and a bell is rung, warning the attendant that his attention is needed. The apparatus constructed at the laboratory is sent out to the various Mutoscope companies in England, Germany, France, and Holland, and any ideas in moving pictures developed by any of these companies are at once forwarded to the American laboratory for perfection and trial.

## MOVING PHOTOGRAPHY FOR THE MILLION:—ALL ABOUT THE BIRTAC.

THE Croydon Camera Club was fortunate enough, on Wednesday, 25th, ult. to enjoy a demonstration lecture by Mr. Birt Acres on 'How to make a moving photo for 2s. 6d.,' which drew an audience of over forty.

The President having sketched Mr. Birt Acres' cinematographic achievements, the latter proceeded with his exposition, in the course of which he explained, from beginning to end, exactly what has to be done by the amateur who desires to take up this fascinating branch of photography, and further pointed out how the mechanism and other devices of the admirably designed little "Birtac" enable photographic film negatives to be taken, and, after printing, how the same instrument is used for projecting the moving photograph upon the screen. Not the least remarkable part of the subject is that, although each film costs but 2s. 6d., the picture on the screen runs as long as the average films shown by the more expensive cinematographs. Moreover, although each of the film positives is only a quarter of the usual area, it gives a picture on the screen which is full of sharpness and definition, and measures 4 feet in diameter.

It is impossible to follow Mr. Birt Acres through all his technical details, enough that he took this opportunity of publicly exhibiting and explaining for the first time two new inventions.



The first was one which permits the operator to show enough film to run for a quarter of an hour or so without the usual tedious changing interval. The second is an ingenious and effective device applied to the Welsbach burner, which should possess an interest beyond its applicability to cinematography. The invention is one whereby gas, drawn from the house supply, instead of passing through the burner at the ordinary pressure, is made to do so at a higher pressure. The difference in light intensity produced by Mr. Birt Acres' simple yet effective attachment was shown by first using the ordinary pressure with a Welsbach burner, and then applying the increased pressure, when the apparent brilliancy at once vastly increased.

#### THE BIRTAC IN ACTION.

Having thoroughly explained the initial procedures, we were next shown the "Birtac" in use as a projector of the moving pictures. Although the light was only what is produced by the smallest Welsbach mantle (1½ in.), and the pictures were shown through a clouded atmosphere on the large scale of 5 feet, the illumination was much better than could be imagined. For ordinary purposes, in dwelling-rooms, &c., providing a stronger illuminant be not used, a 2 feet 6 inches picture would be amply large enough, and would be illuminated to full brilliancy. There was a noticeable reduction of the often unpleasant flicker which accompanies moving photographs; the machine worked easily, without hitch, and without the excessive noise of many another machine. Altogether, the general opinion was that not only was the instrument a remarkably cheap production, but that it was not less notable for its compactness, efficiency, and finish.

The President, in proffering the meeting's thanks, suggested that Mr. Birt Acres should pay them a return visit that day twelve months, when he hoped several of their members would entertain Mr. Acres with a brilliant display of moving photographs taken by themselves with the "Birtac," and jocosely proceeded, amidst loud laughter, to hope that they would be able by that time to give Mr. Acres a striking object-lesson on "How to use his own invention."

#### THE HOLE IN THE WALL AND PUZZLED PRINCE.

In acknowledging the compliment, which was vociferously paid by the audience, Mr. Birt Acres, who was in rare anecdotal vein, much amused his auditors by relating how he had been asked to photograph the arrival of H.R.H. the Prince of Wales to open the Cardiff Photographic Exhibition. Shown where the ceremony was to be held, he said it was impossible to cinematograph the function, "for it would necessitate knocking a hole in the wall." To his surprise the Exhibition Committee immediately ordered the wall to be partly demolished! Subsequently the moving picture was, by special command, shown before eighty guests—half of whom were princes and princesses—at Marlborough House, when all at once the whole assemblage burst into hearty laughter. He (Mr. Birt Acres) could not imagine what could be the reason. However, the Duke of York, with sailor-like impetuosity, exclaimed, "We must have that again!" And they did. On the second time of showing it, Mr. Birt Acres kept his eye on the scene, and when he saw H.R.H. step from the carriage, and, consequent possibly on the cinematograph being at work, pause for a moment in doubt, push aside his hat, and seek with hand for inspiration amongst the locks of his head, the Royal amusement was explained.

Sir David Solomons, Bart., his Worship the Mayor (Mr. G. J. Allen), Mr. F. H. Pearce, and Mr. H. J. Barclay were elected members.

By making use of the exceedingly low temperatures that can now be obtained, a very simple method for exhausting X-ray and other vacuum tubes presents itself. An example of this was given by Professor Dewar at a recent meeting of the Royal Society, at which he was able to produce an almost perfect vacuum. By dipping the end of a closed tube filled with air into liquid hydrogen, the air quickly condensed at the bottom in a solid form. It then only remained to separate from the rest that part of the tube from which the air had been so removed, by heating and sealing off, and the tube was found to possess an extremely high vacuum. In fact, so perfect was the vacuum that it was difficult to pass an electric current through it. One great advantage of this mode of procedure is that in the above case only one minute was taken to obtain the required result.

THE "GREEN RAY."—The "green ray," an optical phenomenon which has been made the foundation of a story by Jules Verne, is a flash of greenish light seen as the limb of the sun rises or sets under certain conditions of the atmosphere. The sea horizon is good for observing it, but the effect is occasionally seen in the Alps or other mountains, and according to Plot Bey, in a paper to the Académie des Sciences, Paris, it is often to be observed in Egypt, from the point of the Delta to Alexandria or Suez, both at rise or set of sun. The ray is distinctly visible, and always of an emerald green, brighter as a rule at sunrise than sunset. At sunset, when the eye can follow the effect better, the ray sometimes appears longer, and ultimately takes a blue tinge. The blue ray has also been observed preceding the green ray at sunrise, for example, by Mr. William Giff, near the ruins of Memphis, not far from the stepped pyramid of Saggarah. He even thinks the ancient Egyptians were familiar with it, because in monuments of the fifth dynasty and others the sign "Kha," representing the rising sun, has the outer streak of a

blue colour, and the two inner streaks are green. Their writings also speak of the greenness of the sun on rising, and they liken it to an emerald. It is evident from all this that the "green ray" is an objective, not a subjective, phenomenon, and that the horizon of the sea has nothing to do with it. Nevertheless, the state of the atmosphere evidently has to do with it, and that of Egypt, ordinarily pure, seems to have much, for the ray is seldom seen elsewhere on land.—*Invention.*

Who was the first to discover the electric light? Our belief up to the present has been that it was Sir Humphry Davy, in 1813, but it now appears that it was Vassili Petroff, a Russian professor, who accomplished the deed in 1802. This is what we read in a note in the Russian edition of the *Cours d'Electricité*, by Eric Gérard, which has been inserted by the translator, M. A. Chatelet, who calls it an historic rectification. Almost all the electrical books published on the Continent tell us that Sir Humphry Davy discovered the electric light in 1813, and no one will hesitate in acknowledging that Russia is rather slow in recognising the services of her scientists, since it took her not less than ninety-six years to become aware of the existence of the 2400-cell battery which allowed Petroff to strike the electric arc before Sir Humphry Davy.

CALCIUM CARBIDE IN NEW YORK CITY.—The Fire Commissioner of New York City has taken steps to regulate the trade in calcium carbide. Owing to the fact that this substance is now stored in most of the sporting goods houses and bicycle stores in the city, it has seemed necessary to take some steps regarding the matter, as the gas is generated by coming in contact with water, and it will readily be seen that it might cause a disastrous explosion, if kept in considerable quantities, in case of a fire. According to the new rules, all calcium carbide in transit through the city and in storage must be in hermetically sealed iron receptacles and marked plainly "calcium carbide—dangerous if not kept dry." No single package must exceed 100 pounds. As to the sale of the carbide, not more than twenty pounds, either in bulk or in cartridges, can be stored or kept in any building used for a dwelling or mercantile purpose, and this amount can only be kept on a permit obtained from the Fire Department. This permit will provide that quantities in cases of two pounds shall be in tight metal packages and kept elevated at least six inches from the floor in a fireproof safe above the street grade. The manufacture, transportation, storage, selling, or use, of liquefied acetylene is absolutely prohibited within the city limits. Provision is made for the storage of calcium carbide in sealed receptacles in quantities not exceeding 100 pounds in isolated buildings of fireproof construction. The storage must also be with a permit from the Fire Department, and the entire quantity stored must not exceed 500 pounds in the aggregate.

LEEDS PHOTOGRAPHIC SOCIETY.—January 24, Mr. Godfrey Bingley (the President) in the chair. Mr. Percy Lund, of Bradford, was the lecturer, "In Wordsworth's Country." Mr. Lund proved a very able exponent of the district traversed. He gave his hearers an outline of the life of the great poet and the surrounding country of his home, illustrated with about forty pictorial photographs of Grassmere, Rydal Water, &c. The lecturer said that he had a purpose in view when he commenced with his camera and note-book to characterise the work of William Wordsworth, and endeavour by the aid of photography to do something more than merely take views topographical of the district. His object was well carried out, and the audience testified their warm appreciation of the pleasure afforded them. The Chairman subsequently announced that the Annual Dinner in connexion with the Society would be held at the Albion Hotel, Briggate, on February 10, and that Mr. H. B. Buckley would lecture upon "Instantaneous Photography" on February 14.

HACKNEY PHOTOGRAPHIC SOCIETY.—January 24, the President (Mr. E. Puttock) in the chair. The feature of the evening was an exhibition of very fine lantern slides by Mr. J. Gunston, illustrating a trip to Switzerland. The collection included a fine series of views of the Valaisian Alps in the neighbourhood of Zermatt, and their interest was much enhanced by Mr. Gunston's description of the places illustrated. Examples of Messrs. Burroughs & Wellcome's new toning tabloids—sodium formate—were distributed for trial, it being understood that the results should be brought up on February 7, when a representative of the makers would be present. It was announced that the coming season's excursion programme was in course of being compiled, and suggestions as to suitable places for outings were invited.

At the meeting of the Institution of Civil Engineers, on January 17, Professor W. C. Roberts Austen, K.C.B., F.R.S., gave a statement of the principles which guide the micro-photography of steel rails. The most generally useful information as to the structure of a steel rail is obtained by treating a highly polished surface of the section with an effusion of liquorice in water, which stains the pearlite a dark tint and leaves the ferrite unacted upon. The most convenient magnification is between 100 and 150 diameters. Normal rails have thus been shown to consist of patches of pearlite set in ferrite; and, although the structure is common to all rails, the ratios of the areas differ widely, the amount of carbon increasing with the area of the pearlite. If the ferrite is arranged in large enclosed polyhedrons, the temperature to which the rail was raised before rolling was too high. The strength and insensibility increase as the size of the grain diminishes; and closely interlocking ferrite and pearlite represent the condition which most favours the prolongation of the life of the rail.



## MONTHLY SUPPLEMENT

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# THE LANTERN RECORD.

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### LANTERN MEMS.

WHY will some lecturers still use transparent screens when they could employ opaque ones to far greater advantage? The fallacy of having the lantern behind the screen was forcibly brought home to me, and those of the audience sitting near me, at the lecture by Mr. Savage Landor, on "Tibet," at the St. James's Hall. The majority of the photographs shown were really beautiful, but, as pictures, were completely spoilt by the strong flare of light inseparable from a powerful illuminant, and coming, as it often did, in the most interesting part of the picture, or where the effect of light and shade was best. This was particularly noticeable with some of the mountain scenes.

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WHY the lecturer or operator decided to have his lantern behind the screen I cannot imagine, for there was plenty of room in front to place the apparatus, unless it was another County Council regulation that prevented them taking up a position in the centre of the hall, and the focus of the front lens not being sufficiently long for the lantern to be placed under the gallery, as in previous lantern displays, when views and cinematograph films were projected on an opaque screen, or a linen one used as such. I remember that Dr. Nansen's pictures were shown by a lantern from the gallery, and very successfully too, but the focus of the front lens then employed was something like twenty inches.

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I do not in the ordinary way advocate such long-focus lenses, but specially large halls require special apparatus, and a lecturer who caters for large audiences should be prepared with a suitable lantern and lenses of such a focus that he can adapt his position to the construction of the hall. In fact, a battery of lenses is a necessity of the modern lantern equipment, in order to avoid such results as I have alluded to above, and which are unpleasant to the eye, especially when the lantern happens to be on about the same level as the seats, which was the case of those in the balcony. At another lantern display, that of one of the large music halls, where some photographs of Klondyke were being shown, the same kind of flare was visible, but, as I was then seated below the level of the arc lamp, the bright spot came generally in a part that was not of such importance to the picture; but, nevertheless, it was marred in consequence.

It is time that all large halls were provided with suitable roll-up opaque screens for projecting lantern slides on, for it is not reasonable to expect a lecturer to carry about a fifteen feet square or larger screen with him, and the results given by the white distempered screens are far in advance of those obtained where views are projected on a folding-up linen screen. If lecturers were to stipulate that a screen of this order should be provided by the management, it would soon be an accomplished fact, for such men as Dr. Nansen, Sir Robert Ball, Professor Lewis, Mr. Savage Landor, and others that will occur to my readers, can practically dictate their conditions, and all lecturers that followed would benefit by the new order of things.

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THE mention of Professor Lewis's name reminds me of his excellent Cantor lectures at the Society of Arts and the practical information he gave his audience in regard to the manufacture and use of acetylene gas. One point stands out strongly among so much that was of value, and that is, the simple fact of adding sugar to the water used for the decomposition of the calcic carbide made the generation of the gas most regular. All that is necessary is to make a saturated solution of sugar and use that instead of the ordinary water. Another matter as to purity of carbide, and, in consequence, the superiority of illumination obtained from the gas: Given pure carbide and an ideal generator, the amount of gas given off per pound of carbide should be five cubic feet, but not two in twenty gave this, in fact generally the amount from generators on the market was three and a half cubic feet per pound.

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As regards safety in use, the first thing to do is to drive off all air from the generator, for with one part of acetylene and one part of air in an enclosed vessel provides the most explosive mixture. Previously it was thought that the range of explosive mixtures was a small one, but the Professor stated that it was shown by recent researches nine volumes of air and one of acetylene was an explosive mixture, while between eleven and twelve parts of air and one of acetylene gave the maximum explosive mixture, and as much as seventeen parts of air to one of acetylene was found to be explosive under certain conditions.

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THOSE using generators may know by the residue of the calcic carbide if their apparatus is working satisfactorily, for it tells the tale of the temperature during work, and that apparatus which works at a moderate temperature is most suited for the purpose. If the deposit of lime is *white*, a temperature of 400° Centigrade has been reached during decomposition; if *yellow*, then 600° to 700° Centigrade; and, if *black*, over 780° Centigrade is the heat to which the carbide has been subjected. In some instances it has been known for the carbide to be red-hot in the generator, and it is simply marvellous how water can raise the temperature of any substance in the rapid manner it does with calcic carbide, hence the necessity for slow generation.



IN theory, half a pint of water is sufficient for one pound of carbide; but, in practice, one pint per pound is necessary to make up for water vapourised as steam, and by water clinging to the lime. It is necessary that the carbide should be pure, and it is satisfactory to know the British-produced carbide is wonderfully free from impurities. There is no doubt that there is a great future for acetylene gaslight, and, when it is fully understood and apparatus placed on the market that as nearly as possible approaches the ideal, then not only lanternists, but the general public, especially in country places, will be able to avail themselves of this truly marvellous light.

ANOTHER new light has been invented of an incandescent electric order that bids fair to revolutionise general lighting, for, while possessing the pleasantness of the glow electric lamp, it will have a far longer life than the delicate carbon filament as now used in incandescent electric light lamps. The new lamp, as described by Mr. Swinburne at the Society of Arts, is the invention of Professor Nernst, of Göttingen University, and, while employing rare earths as used in the Welsbach mantles for incandescent gas lighting, has the advantage of a fairly strong rod form instead of the delicate fabric now so familiar. The curious part is, that these earths, which in the ordinary way are insulators or non-conductors of electricity under normal conditions, are good conductors when heated; hence, by the simple device of warming by a match or small spirit lamp, the rods are raised in temperature and the electric current passes through them and renders them incandescent. It is hoped shortly to have some experiments with these lamps as lantern illuminants.

G. R. BAKER.

## COLOURING LANTERN SLIDES.

### II.

IN a previous article reference was made to the necessity of absolutely clear high lights being present in the slides intended for colouring. A beginner having provided himself with a suitable subject, such, for instance as a church or any building standing in the midst of a landscape in which a fair amount of trees are included in the foreground, and middle distance with well-defined hills in the background, may proceed to make preparations for conducting the work in a comfortable manner at any well-lighted window, and to do this a good retouching desk is necessary.

The following tubes of ordinary artists' oil colours should be provided; these will cost about fourpence each, viz., Prussian blue, burnt sienna, raw sienna, gamboge, crimson lake, and ivory black, together with a tube of megilp and a small bottle of mastic varnish, and a supply of spirits of turpentine. With these at hand and a few good finely pointed sable brushes, a very wide range of work can be done.

In colouring a lantern slide it but seldom happens, when dealing with such an example as has been chosen, viz., a landscape, that much actual brush work is required. The operation, in point of fact, is more of dabbing, and this is by far the most important part of the entire operation, and will take some little practice for any one to become proficient in. After a few attempts, however, the dabbing will become quite a simple matter, and great rapidity in the laying on of broad patches of colour in an absolutely even manner will be easily acquired.

Having carefully studied the nature of the picture to be coloured, when such is placed upon the retouching desk, the first portion which falls to be worked upon is the sky. If attention has been paid to the foregoing remarks in these articles, this will be of absolutely clear glass in the slide, or as clear as gelatine can be made to yield such. If it be desired to so colour the sky portion of the picture as to resemble a sunset, then the first act will be to commence by placing a few streaks of Prussian blue, previously amalgamated with a little megilp along the upper portion of the sky, care being taken, however, that the colour is not applied straight across in parallel bands, but more in an oblique direction, dropping somewhat from either of the top corners according to the formation of the picture.

The Prussian blue has now to be dabbed in an even sheet over the surface desired by means of the ball of the middle or forefinger, the dabbing being so conducted as will distribute the colour more densely at the zenith than at its lower extremity, at which point it must be very faint, merely, as it were, vanishing into clear glass at those parts where the warmer tints of the sunset hues are to be worked in.

At first this dabbing operation may appear difficult, but it will imperceptibly become easier after every attempt towards success, and a beautifully even gradation from dense blue at the zenith to a very slight blue tinge where it joins the warmer hues, always noticeable in a sunset scene, will be one of the easiest tasks in the whole operation. The

Prussian blue, having been evenly distributed by means of dabbing the lower portions of the sky, has now to be dealt with, small streaks of crimson lake amalgamated with a very small portion of Megilp is now placed in position, a small distance below the point where the blue colour has been shaded off. The ball of the finger used in dabbing is now cleaned with a rag and turpentine (this may be kept at hand in an old egg cup). With the clean finger the crimson lake is dabbed until it is blended nicely into the blue and overlaps the hills in the background. When the crimson lake has likewise been evenly distributed, any overlapping on the hills or other portions, such as the tops of trees, is wiped clean with a rag, leaving a faint line of clear glass just over the hill tops; this faint streak of clear glass is then treated delicately with a slight golden glow, likewise produced by dabbing a very little gamboge, in the same manner as the two previous colours, any overlapping of the hills being wiped off with a clean rag. We have now a plain tinted sky, verging from golden yellow at the horizon to a somewhat deepish blue at the zenith, and, if the dabbing has been skilfully performed, the sky portion of the slide will present a nice even appearance free from any small finger markings or other eyesores.

A beginner, however, at lantern slide colouring is very apt at this stage of the operation, when comparing his handiwork with that of the professional colourist's, to lose heart at the appearance his slides will present alongside that of a trade slide, and very naturally jump to the conclusion that there is some other way of doing the work, whereby the slide is made to present the delightfully even and brilliantly transparent sparkle of a professionally coloured slide, but the somewhat crude, hazy, or foggy appearance a slide presents at this initial stage of the dabbing is just what it ought to be, for the misty oily appearance will disappear at the later stages of the operation, so that no one ought to lose heart at seeing the appearance of the slide at this stage, but just go on with the work, concentrating all his thoughts in being able to overcome the dabbing difficulties until a beautifully even surface of colour is laid on. The final transparent brilliancy is acquired later on, which will be described.

Having filled in a warm sunset sky, if it be desired to introduce a very few fleecy clouds, the services of a finely pointed stump are brought into play. Nothing makes a better stump for this purpose than the handle of an ordinary paint brush; this may have a piece of clean chamois leather tied on when required. With this stump the shapes of ordinary light fleecy clouds are drawn in upon the flatted sky, and the ball of the finger is again taken to the clouds where necessary, using a little grey colour where such is required in effects that are introduced up against the light.

Having completed the sky portion, attention may now be bestowed upon the hills. After cleaning the tops of them from any overlapping of the gamboge used in working up the sky, if it be desired to introduce a purple hue, this tint is easily produced by mixing in proper proportions a small quantity of Prussian blue and crimson lake, both colours being well thinned with megilp; the purple colour is then in this case applied to the hills by means of a fine brush in such a manner as not to overlap the golden sky line, and if any broad patches have to be introduced dabbing may be resorted to, but as a general rule such surfaces are but of small extent and the brush is made easily to lay on the tint, which in this case is a thinnish wash.

Next in order will most likely come the trees. These will very probably have overlapped the sky line, and, as it is a summer scene we are engaged upon, a good transparent green is produced by mixing gamboge and Prussian blue, working the green colour carefully over the outline of the tree by means of a fine brush.

Any buildings on the view are easily tinted with a little raw sienna thinned with mastic varnish or megilp, and the foreground, if composed of tufted grass, is easily tinted with a similar pigment to that used in colouring the trees, only care should be observed not to apply the colour too strongly, as such tends to give the slide a heavy, crude effect. This must be carefully studied through every portion of the work, and it is just here that beginners are prone to err. What may be termed a light wash or application of colour is generally sufficient.

Pathways may be tinted either with burnt sienna, or, if of a pebbly character, a slight wash of purple tint will probably give the most pleasing effect.

Any heavy objects in the foreground, such as trees, are easily tinted with raw or burnt sienna, likewise heavy masses of rock or masonry. In the latter instances a slight touch of green in the darkest portions will give a mossy effect that is very pleasing. It is in the introduction of these little artistic touches that the great secret of success lies. A beginner by this time will very probably have found out that some of the colours mentioned are more transparent than others. Prussian blue stands unrivalled as a blue in this respect, hence its great value in sky working, and is also invaluable in producing other tints, such as greens, purples, &c. When mixed with red or yellow, such as crimson, lake, or gamboge, the latter colour is also a very valuable one, and is, perhaps on account of its wonderful golden transparency, the most useful in any colour selection; crimson lake is also valuable on account of the difficulty of securing a transparent red.

Burnt and raw sienna fulfil their different functions admirably in being slightly less transparent when used on more opaque parts of the picture.

Not only does the question of transparency form an important item in the selection of colours, there is also the further question of employing



only such as are what is termed good dabbers, as well as those that are amenable to rapid drying. It will not be long ere a beginner will be able to distinguish between what is a good and a bad or indifferent dabbing colour. In the front rank in this respect comes our old friend Prussian blue, than which there is no finer or more useful blue in existence for this class of work.

By the time a beginner has worked in by means of dabbing his first sky, it is very likely he will have formed a pretty decided opinion upon the need of selecting, especially for slide colouring, only those transparencies that are absolutely flawless in those portions which must appear throughout with an absolutely flat and even field. An example of such parts is found in the broad exposure of sky in a landscape slide. Any scratch or indent in the gelatine surface of the slide will soon become apparent in a marked manner owing to the pigment appearing much more opaque at such places, this, of course, being due to the extra quantity of colour held in suspension within the scratch. A mark of this description is fatal to first-class results in a sky line or other equally clear parts of a slide, but is, of course, of much less importance if present in such other parts as are represented with greater depths of opacities.

It follows, therefore, that all imperfect slides should be discarded for colouring, and attention strictly to this point will soon become marked in the superior class of pictures a worker will turn out. It is far better to devote a little attention to the production of a really perfect surface to all slides intended for colouring purposes than to attempt to patch up or produce good results upon such slides as are full of imperfection and quite unsuitable for this purpose.

T. N. ARMSTRONG.

### MY LANTERN EVENING IN THE FENS.

THE article on "Judging a Lantern-slide Competition," in the February issue of *THE LANTERN RECORD*, reminds me very much of a lantern show I gave a few weeks ago to an audience of rustics, who had assembled in the large club-room of a village inn, situated in the very centre of the fen district. How it all came about is interesting.

Two winters ago, many young men of the village formed a mutual improvement society, at which papers were read, debates held, &c. The meetings were held weekly during the season, and a very substantial balance was in hand. At the beginning of this last winter, however, the young men thought it selfish to take their pleasures alone, and accordingly invited the opposite sex. This progressive movement did not suit the President, who was also the vicar, and a ballot was taken, with the result that forty voted for the admittance of ladies, and three against. One of the minority was, of course, the vicar, who, seeing that the young men were determined to include females, smashed up the society. The young men of the village now spend their evenings playing draughts, chess, and sing-songs, at the very respectable and well-managed inn.

When the society was in a flourishing condition I had promised a lantern evening, in fact the date was fixed and all my own arrangements made. After the smash I saw the secretary, who was, of course, full of regrets, &c.; nevertheless, he asked if I, so as not to disappoint some of the members, would give a show at the village inn, as the use of the only other large room in the village (the schoolroom) had been refused by the vicar. During the course of our conversation I began to see that a few of the members wanted to try and upset the late president by having a show at the village inn, a place, strange to say, he never visited. I entered into the spirit of the thing, and promised a show free of expense if they would find the room. I did so because I had in my head an experiment that I had long wanted to work out, and now was a grand opportunity. Before detailing the experiment, I might mention that the ex-officials of the society obtained the use of the club-room in the village inn free of charge, on one condition, *i.e.*, an interval of a quarter of an hour was to be allowed for refreshments, and the finish to be about ten minutes before closing time. I consented to this, and I heard afterwards that the landlord made a good thing out of it. But enough of this, get we to the eventful evening. My private lantern shows are not large, and I have never yet found that I really needed a limelight outfit. I had always used oil up to the lecture I am now describing, but for that evening I bought one of Tylar's Aladdin acetylene lamps, and, thanks to its efficiency, ease of management, and freedom from smell, the illumination of the six-foot screen was perfect, and the whole proceedings went off without a hitch. I shall never again use oil if I can get calcium. Gas was unknown in the village, which fact accounted for the extra special interest taken in my charging the lamp and making the gas, all of which I did in full view of the audience. Hitherto evil-smelling oil lamps had been used, and the sensation that I caused may be better imagined than described.

Punctually, at seven o'clock, the doors of the large room were thrown open, and in rushed such an audience the like that I had never before witnessed. No charge was made, every one was welcome; there were old and young, tradesmen and labourers, teetotalers and tipplers, in Sunday and working attire. A limited number of children were admitted, for the simple reason that they would have filled the room, which, by the way, held about 150 persons. So much for the arrangements and audience. The most important part was yet to come. I was to try the experiment that I had long thought of, *i.e.*, to solve the question, "What

slides are most appreciated by an audience of rustics?" I divided my collection into ten parts, *viz.*: (1) Local views and celebrities; (2) Views of London; (3) General foreign views; (4) Statuary and studies of the nude; (5) Figure studies; (6) Astronomical and micros.; (7) X Rays; (8) Actresses; (9) Ordinary highly coloured commercial slides—religious and tales; (10) Comic slipping slides.

A selection from the many remarks made during the evening would prove very amusing reading, but space and time now forbid their insertion in this article. I explained the slides as I passed them through, and at the end of the show took votes on which were the favourite subjects. All were allowed to vote, two or more times should they so desire, and the result was as follows:—Seventy-four voted for section 1 (local views), which included various views of the church, portraits of the publican, barmaid, policeman, &c., which I had taken specially for the occasion. The portrait of the policeman was hailed with a tremendous outburst of cheering, he being a very popular man in the village. One of the younger generation caused much amusement by saying, that he (the policeman) "did not stand like that—so still—when he saw boys in an orchard." The views of the church, in spite of the trouble with the vicar, came in for much applause. The next on the poll was section 7 (X rays), seventy-two voting for it. Green as these rustics are said to be, they were greatly interested in the marvellous X-ray pictures, that were taken, and kindly lent to me, by Mr. W. H. Hayles, of Cambridge. They sat, open-mouthed, as I passed before them pictures showing shots and needles in the hand, enlarged joints, &c. Section 8 was next, with seventy voters. My audience were greatly pleased at many of the charming faces I put before them; little thought they that much was due to retouching the negative and painting the model. Owing to some rather rude remarks against section 4, and for which fifty-seven voted, I was compelled to cut down the number of slides; what few I did exhibit, however, pleased about one-third of my audience. Fifty hands were held up for section 6, they being most fascinated by photographs of the moon, and of a common every-day flea. The slides representing figure studies elicited forty-four votes; those of London (section 2), thirty-four votes; general foreign views (from a missionary set) obtained but twenty hands. The last two on the list were also last on the poll—commercially coloured and hand-painted slides, and comic slipping, these obtaining twelve and nineteen votes respectively.

I do not claim that my little experiment has produced anything of value, as audiences, like slides and lecturers, differ greatly. It is, however, interesting to note that photographic slides were first favourites, and that the coloured slides had but few admirers, and of these few the majority were children, who, of course, are more interested in a man swallowing rats than, say, a fly's tongue.

It, perhaps, is not strange that local pictures should head the poll, for, although the originals were seen by the natives almost every day of their lives, the novelty of having them reproduced on the screen caused the intense enthusiasm and the heavy voting.

RICHARD PENTLACE.

### NERNST'S ELECTRIC LIGHT.

[A paper read before the Society of Arts by Mr. James Swinburne.]

BEFORE describing Nernst's invention it may be profitable to spend a few minutes reviewing the position of electric lighting. The whole industry is at present controlled by the incandescent lamp. We are so accustomed to this, and it is taken for granted in such an unconscious way, that we do not realise how much everything depends on the maker of the carbon incandescent lamp.

#### HISTORICAL NOTES.

In very early days, that is to say, in the early eighties, there were a few Edison lamps at 100 volts, with an efficiency too horrible to mention, but the Swan lamp came along made for 50 volts. I say made for 50 volts advisedly; I mean that the makers tried to make 50-volt lamps, and produced lamp taking from 40 to 60 volts. If the lamps were not bright enough, you ran the engine faster, or put a smaller pulley on the dynamo. (The belt then generally slipped, but that is not to the point.) For about four years, which is a long period in the development of such a rapidly growing industry as electrical engineering, the makers of incandescent lamps, or, in fact, the makers of the Swan lamp, decreed that the electro-motive force used should be from 40 to 60 volts. There was no appeal. There was no development of central station supply at that time, but still, even then, in large buildings there was the longing for higher pressures on account of the cost of the mains.

About 1885, the Swan 100-volt lamp came into use. It was a clumsy affair, with little loops of platinum at the sides. At first the lamps were pretty bad, but they gradually improved, and 100 volts, or in some cases 110 volts, became the recognised pressure for electrical supply.

As town lighting from central stations came into being, the limit of 100 volts became a serious trouble, and the evil was partly mitigated by the use of three, or even five, wire systems. I must point out that the incandescent lamp exercises its tyranny in two ways. It not only insists on a low pressure, such as, say, 100, and thus demands large leads to feed it, but it is so sensitive to variations of pressure that the system of distribution has to be arranged to give a practically uniform pressure at the terminal of the lamp. The necessity for uniform pressure



probably gives more trouble, and costs more than the mere low pressure, and it would be cheaper to supply at 100 volts with a good margin of permissible variation of pressure than supply at 200, with a very small percentage of variation.

Quite lately the incandescent-lamp makers have produced things called 200-volt lamps, and some make them for 250 volts. So there is a general tendency on the part of supply companies to jump to a 200-volt supply. The innocent consumer is therefore pressed by the company to change over to 200 volts. The company likes the change very much, and the lamp-maker also enjoys it, as he makes more lamps and charges more for them.

Considering the enormous importance of the incandescent lamp, its improvement has received extraordinarily little attention. It limits us as regards pressure, it used to hamper us by its cost, it limits us as to variation of pressure, and it limits us very seriously by its inefficiency. Yet, in spite of these, the carbon incandescent lamp has made practically no advance in fifteen years. Of course, mere detail improvement in manufacture has taken place, and this has led to better quality and greater uniformity, hence cheapness; but there has been no radical improvement. The jump to 200 volts from 100, or from 50 to 100, did not depend on any sort of radical improvement in the incandescent lamp; it was merely the result of detail improvements, making it possible to produce long thin filaments. Other things being equal, it is easy to see that the long thin filaments must be weaker. If the carbon has the same specific resistance, the relation between pressure and length is  $E = L\frac{1}{2}$ , and  $E = D - \frac{1}{2}$ . If the filaments are flashed, the proportions will be still more extreme. The question of high-pressure incandescent lamps is thus: how far can we make the filaments longer, and thinner, and flimsier without exasperating our consumers? Unfortunately the consumer is rapidly getting saddened as it is. The 100-volt eight candle-power lamp does not please him much, and the 200-volt 8 candle-power lamp has in no way delighted him; if the lamp is made with two 100-volt filaments in series, it combines the disadvantages of both without the advantages of the small candle power of either. But it adds some further disadvantages peculiar to the higher pressure which I have not so far touched upon, and that is, that the higher the pressure the more troubles there are through the silent discharge, or whatever it is called. I need only refer to the well-known experiment, in which a third terminal is sealed into the lamp. A galvanometer then shows a current going across country inside the lamp. This is, no doubt, intimately connected with the life, or rather with the death of the lamp.

I have dealt with the question of high-pressure incandescent lamps at some length, because the subject is really of vital importance and is too much neglected. Our technical colleges, and our technical press, and our technical societies pay the greatest attention to questions of a per cent. or two in the efficiencies of dynamos and transformers, and give a good deal of attention to engines and boilers. That is because there is plenty of room for calculations in connexion with these subjects, but the incandescent lamp, which at present holds the whole career of the lighting industry in the little curl of flimsy red-hot carbon that can hardly support its own weight, receives no attention at all. How much does the average electrical engineer know about incandescent lamps? The only subject that is treated in the same way is the cable. About half the money in town lighting goes in the cable, a mere fraction in the dynamos and transformers themselves, so the average electrical engineer knows nothing about cables.

So far I have only discussed the incandescent lamp; the arc lamp has also to be considered. I will not say much about the arc lamp just now, but will add a little more when the Nernst lamp is compared with it. The ordinary arc is limited in pressure to about fifty volts, including the series resistances necessary for regulating. The enclosed arc is a new development, which is more satisfactory as regards pressure and as regards consumption of carbon.

The lamp I describe to-night is the invention of Professor Walther Nernst, of the University of Göttingen. Though he is a young man, Professor Nernst's name is already known to all modern chemists as a leading authority and original thinker in the field of physical chemistry. It is unusual for a man who has climbed to the top of one tree to jump to the top of another.

Nernst's, like most great inventions, is exceedingly simple as soon as it is understood. The efficiency of an incandescent body, as far as radiation goes, depends simply on the temperature. The efficiency of an incandescent lamp, for instance, depends on the temperature of the filament only, providing there is no loss by convection. The carbon will not stand a sufficiently high temperature, especially as, in addition to its low specific resistance, the filament has to be long and slender, and thus weak. Nernst, therefore, chose a material that would stand higher temperatures than carbon, and his material has the incidental advantage that its specific resistance is so high that strong rods can be used for high pressures instead of thin filaments. The most refractory materials so far used in lighting are zirconia, which has been used to replace lime in the limelight, and the oxides or so-called rare earths, in the Welsbach mantles. I am aware, of course, that many people suppose that the Welsbach mantle is not very hot, treating it as if it were at a temperature, for instance, below the melting point of platinum. The

light emitted is supposed to be due to some special power of selective emission due to the oxides employed. I have had a good deal to do with incandescent gas mantles, and I find no reason to suppose there is any magic effect of this sort going on. The part of the flame where the mantles hang fuses platinum wire easily, and very few materials can stand the temperature without fusing or volatilising. Lime and many other oxides volatilise slowly from the mantles. I do not mean that the mantles are above the boiling point of lime. I have some idea of its melting point, as I have made a few pounds of melted lime and run it out on the floor to look at it. The Welsbach mantles, which are now chiefly thorium, are at a temperature near their softening point, and in the making are raised to a temperature at which they begin to soften.

Nernst takes highly refractory oxides as his material. It does not seem promising, because such oxides are notoriously good insulators. But such insulators are electrolytes when hot; Nernst, therefore, heats the rods to make them conduct, and then heats them electrically, preserving a temperature which is within the limits that the material can bear without softening. This means that he can take the most refractory bodies supplied by the whole range of chemical research, and can heat them to a temperature short of their softening point, and can thus get an efficiency unknown to workers on the incandescent lamp. Such efficiency also means whiteness of light, so long as the efficiency is not too high. Thus the crater of the arc, being at a temperature of boiling carbon, gives a light that is unpleasantly blue.

The material is worked up into little white rods. Each rod is mounted on two platinum wires, a little paste made of refractory oxides being applied to the joints. The little rod with its two wires is then mounted in a holder which fits ordinary electric-light fittings. As the rods fall in resistance as the temperature increases, after the manner of electrolytes, an increase of current produces a decrease of resistance. This tends to give some instability in running in parallel on supply circuits. This instability is corrected, as in an arc lamp which has analogous properties, due to a different cause, by a series resistance. The Nernst rod has therefore a resistance in series. This is made up of exceedingly fine wire, and for ordinary circuits amounts to ten or twelve per cent. of the whole resistance of the lamp. The consumption, including the resistance, is 1.5 watts per candle for large lamps, and 1.6 for small lights or low pressures. In small or low-pressure lamps the loss of heat at the ends is larger in proportion.

Such a lamp as I have described will not light up of itself, for the rod is an insulator when cold. The simplest way to start it is to warm it up with a match, or, better, with a small spirit lamp. Such a lamp as this is not only very cheap as regards first cost, but very economical in running. The life of rods running at an efficiency of two-thirds of a candle per watt, including the resistance, is already more than 500 hours in good specimens. If the Nernst lamp advances as much in the first few years of its existence as the carbon lamp did between 1880 and 1882, it will soon be made so well that the rods last a life time. When the rod is worn out, a new rod with its wire mounts is all that is replaced. The whole lamp is not thrown away at all.

The method of lighting I have described, though it may be used in many cases, such as large public rooms, is really a savage mode of ignition, fit only for dealing with uncivilised commodities, such as gas and tobacco.

The small lamps and the lamps of medium size are in practice started by a heating resistance. This is arranged close to the rod, and in shunt to it. As soon as the rod is hot enough to conduct, its current works a tiny cut-out in the resistance circuit. In large lamps the heating system is a little more elaborate, as the resistance arrangement is arranged as a sort of hood which covers the rod. As soon as the rod conducts, not only is the resistance circuit broken, but the electro-magnet lifts the little hood clear off the rod. In all these forms the rod and its mounting are replaceable without interfering with the rest of the lamp.

#### THE FUTURE OF THE NERNST LAMP.

Compared with the small incandescent lamps, as you deal with a material of much higher specific resistance, it is easy to give both small lights and high pressures. The question of lighting is exceedingly important, though it appears trifling at first sight. People are so accustomed to lamps being turned on from the door without any further trouble that they will generally object to having to light them with matches or spirit lamps, but there are many cases in which it will be quite satisfactory to have one lamp with an automatic lighter to show you the way into the room, the rest being lighted with matches or a spirit lamp, as needed. There will be, however, a considerable opening for the cheap, small-power, high-efficiency lamp; and the disadvantage as to lighting is small in such cases as cafés, restaurants, churches, hotels, railway stations, and, in short, in most public rooms is small.

Coming now to the next size, that is to say lamps, of 20 to 200 candle-power, and even small lamps in which it is worth while to have automatic ignition, the first cost of such lamps will be higher than the first cost of incandescents; but, as the rod itself has alone to be replaced, that is a matter of very slight importance. This size of Nernst lamp has further every chance of completely ousting the carbon incandescent on the score of cheapness, as to renewals, higher efficiency, better-coloured light, and perhaps more especially high pressures. Once the Nernst lamp becomes



so general that systems of distribution are laid out to suit it, instead of to suit the carbon lamp, the carbon lamp is practically "out of the running." It must be remembered that the Nernst can compete with the carbon filament at any pressure that suits the filament, but the Nernst lamp can easily go right out of the depth of the filament and have the higher pressures to itself. It must be remembered that at present the cost of cables in a system of distribution is an exceedingly large item.

Turning now to the large lamps, they compete with the arc lamp in efficiency. Of course, the efficiency of the arc lamp is not a very definite quantity. The candle power is generally determined by multiplying the current by two and adding zeros at discretion. All I say is that, however many zeros the good nature of the maker may supply, a Nernst lamp taking the same power gives a better light. When carefully arranged on the photometer, the arc may be better in given directions, but a lot of light given in directions that you do not want is not the same as the same light distributed with a uniform spherical emission. The arc lamps shown here will give the audience a good idea of the relative values. The Nernst gives a pleasanter, and, of course, a perfectly steady light. Coming to costs, the Nernst will be very much cheaper in first cost, but enormously cheaper in maintenance. It also goes quite away from the arc as to pressures. There is no trouble, for instance, in making large lamps to work in parallel at 500 volts, and by using double rods at 1000 volts. This puts an entirely new development of electric lighting in the hands of the engineer.

There is one point I have said little about yet. The incandescent lamp, which is still with us, gives trouble, not only because of the low pressure it needs, but also because it demands that the pressure shall be kept uniform. It seems quite possible that the Nernst lamp may be made to stand a much greater variation of pressure than the filament. If this proves true, it means an enormous difference in the designing of distribution mains. I do not like to say much about this yet as the invention is too young, and too little time has been available to make much certain progress in that direction. Results are promising, but it is best not to be sanguine.

It is difficult to discuss an invention like this without being carried away by enthusiasm. I feel, however, that I have but feebly shown forth the probable future of what seems to me the greatest invention in electric lighting that we have seen for many years. Still I am sure I have not been too sanguine.

#### DISCUSSION.

Professor Ayrton, F.R.S., congratulated Professor Nernst on having achieved such a wonderful result by such simple means, viz., rendering an insulator conducting by heating it; and Mr. Swinburne on the way in which he had put the matter before the meeting. The knowledge that an insulator could be made to conduct electricity by heating it was much older than the recent experiments of Sir W. Roberts-Austen, for some twenty-three years ago a paper appeared in the *Transactions of the Royal Society* on that very subject of the extraordinary diminution of resistance in a solid electrolyte by heating. In Japan, plates of zinc and copper were put on each side of a glass plate, which was heated, and the electromotive force passing, as indicated by a high-resistance voltmeter, after short-circuiting the cell, appeared almost as rapidly as if the plates had been immersed in dilute sulphuric acid. It had also been known ever since carbon filament lamps had been on the market that there were certain difficulties connected with them, and many experiments had been made, and patents taken out, with the object of using refractory earths; but, apparently, no one before Professor Nernst had thought of the simple expedient of heating a very good insulator with a match or spirit lamp, applying a current of suitable potential, and thus obtaining a brilliant light, such as they had now seen for the first time. This result was clearly of enormous commercial importance, and would be an entirely new departure in glow-lamp electric lighting. It was also extremely interesting from the purely scientific side, touching on a question which Mr. Swinburne had passed over rather lightly, as if it was only a few foolish people who fancied there was something in the Welsbach mantle which they did not entirely understand. This invention showed, at any rate, that illuminating gas was not necessary for obtaining light by incandescence from the rare earths. Some five or six years ago he asked an assistant of his to look up the literature on the subject of the Welsbach burner, and see if any report had been made throwing any light on the question whether the effect of the burner depended solely on the high temperature. He gave him a reference to a German paper in which experiments were quoted, which seemed to show that the high temperature was not the sole factor. Later on he discussed the matter with a very distinguished English chemist, who agreed in the view that it was not solely a question of temperature, and a year or two afterwards he again discussed it with Professor Elihu Thomson in America, who took exactly the same view. Many people thought that the material of which the mantle was made had the power of absorbing oxygen from the air or the gas, and compressed it, much as spongy black absorbed hydrogen and oxygen, and so caused these gases to burn under considerable molecular pressure. It was not merely that the Bunsen flame raised the material to a high temperature, but that the gas and air were compressed together in the pores of the material, so that the gas

was burnt under pressure, and so you got a much higher temperature than you otherwise would. In the glow lamp, as they were not dealing with gas, it did not seem that the materials could play any such part. There seemed to be something in that idea because it was necessary for the mantle to be a certain exact composition; you could not take thorium or zirconia at random and use it, you must have a certain definite combination to produce an efficient mantle. In fact, it was the addition of 0.4 per cent. of ceria which converted the Welsbach burner from a ghastly failure commercially into a wonderful success. He should like to know whether the mantle was not at a much higher temperature than the flame which surrounded it, and whether a particular combination of materials did not reach a much higher temperature than another combination immersed in the same flame. If so, it was not merely the temperature of the flame which produced the result. There was one great advantage about the Nernst lamp, it did not seem to require a thin glass bell and a vacuum, and thus got rid of a very serious difficulty, because these bulbs were very fragile, and were easily destroyed by a touch of a broom or carelessness in carriage; many lamps also were defective, not from any fault in filament, but because the vacuum was imperfect. He should like to know the reason of the difference in the colour of the light of the Welsbach and the Nernst lamps—was it a difference in material or in temperature? He understood from his colleague, Dr. Armstrong, who visited Professor Nernst some time ago, that it was essential to use an alternating current, as with a direct current the incandescent rod soon ceased to make good contact with one of the platinum terminals.

Mr. Hiram Maxim said he had always understood that the light in the Welsbach burner did not depend entirely on the temperature. There were many things in nature which gave light without any heat at all; such were glow-worms and fireflies. His opinion was that any substance, if there were any, which did not volatilise at all, would give a light proportionate to the temperature; that platinum, or iridium, or iron, if the iron was not burnt, would all give the same light at the same temperature, provided none of the material was wasted. Of course, if the least particle passed into the air, the flame would be coloured. In all probability the light emitted did not increase as the temperature directly, but as the square, some said as the cube, and some said as the fifteenth power of the temperature, and he was inclined to think that a slight increase in temperature increased the lighting power a great deal. In the Welsbach burner the light was not white, and that, he thought, indicated that some change was going on which made the apparent light higher than that due merely to the temperature. If carbon were heated to the same temperature, it would not give the same light.

Mr. R. S. Erskine said it would be an enormous advantage to central supply stations when these lamps came on the market. There was a great difficulty in getting satisfactory 200-volt lamps, though he did not know that they were much worse than the 100-volts. The fact was the public were now educated up to a much higher standard of light, and wanted much more than satisfied them some years ago, when they were only used to candles and ordinary gas burners. Those who were formerly well satisfied with two wax candles in their dressing-room would now put up two 32 candle-power lamps over their dressing table, and the lighting all through the house was on the same scale. They were not content with an 8 candle-power lamp that gave eight candles, but wanted it overrun so as to give ten or twelve candles, and the 200-volt lamps would not stand this; the old 100-volts stood it to a certain extent, but soon got inefficient. The great trouble with all central stations was that the lamps took more current than they used to. It looked as if these lamps would give the public what they wanted at a reasonable price.

Mr. W. M. Mordey thanked Mr. Swinburne for speaking the truth about the 200-volt lamps. The supply of lamps was a matter which really required attention, because it led to a great deal of dissatisfaction. He thought the correct plan would be for the companies to supply not electricity, but light; and, instead of persuading customers to buy lamps of any particular kind, they should make an inclusive charge, and supply them with lamps themselves. This would prevent dissatisfaction. He congratulated the Society on this paper, which he thought would mark a new epoch in electric lighting; it was the first page in a new volume, recording an invention which would rank with that of the Swan lamp, since which there had been nothing brought forward so pregnant with results. They must also congratulate Professor Nernst on his invention, and take care that he had the credit of it, and was not robbed by a number of people, who would be immediately writing to the *Times* to say that they did the same thing in their back kitchen twenty years ago. That was what always took place in the case of a new invention. Mr. Maxim had anticipated what he was about to say about the glow-worm. Professor Langley, in America, dealt with the radiation from fireflies and glow-worms in a paper a few years ago, and gave a diagram showing the total radiation, and what proportion was luminous, the result proving that the glow-worm had solved the problem which Tesla, Hertz, and many others had been working at, of making nearly the whole of the rays luminous. If they could only get a glow-worm to come and read a paper explaining how it was done, Dr. Nernst's lamp would have no future before it. One advantage these lamps possessed was that they would be able to light their cigars and pipes at them. He agreed with



Mr. Swinburne that the possibilities of the carbon filament were about exhausted; that there had been very little improvement for a long time; and it was a remarkable thing that, just when the carbon filament was failing to meet their requirements, this new invention should be made, which seemed to meet the case. It was like the discovery of gutta serena at the critical period which got electric cable-makers out of their difficulties. But, though the new lamp was evidently a very robust child, it was still a child, and it would at any rate take a little time to displace existing lamps. If lamp companies' shares went down at all on account of the Nernst lamp, he would like to buy some, as they would have time to rise again before the incandescent carbon disappeared.

Dr. Fleming asked if there was any deterioration in the quality of these lamps after a time, such as occurred with carbon filaments and Welsbach mantles; because this would be very important in considering the commercial value of the invention. If the lamp only required 1 watt or  $1\frac{1}{2}$  at starting, and, after a few hours' work, 4 or 5, it would be a serious disqualification. It was well known that most of these radiants did deteriorate after a time; with the lime light for instance, after a few minutes, the radiant quality of the lime diminished, although it was played upon by an oxyhydrogen flame at a constant temperature; and turning the lime round would markedly increase the amount of light on the screen.

Major Flood Page, having congratulated Mr. Swinburne on his paper, said he was much interested in this subject, though he was not a scientific man. When he saw Professor Nernst some months ago, in Germany, he was very much astonished to find that so young a man had been able to attain such a high scientific position. Mr. Swinburne had spoken of the carbon lamp having reached finality, but he might say those connected with carbon lamps, as he was, were as much interested as any one in this new departure. They had a higher interest than that of any particular lamp, and that was in the advance of electricity. He quite agreed that nobody but Professor Nernst could claim the credit of this invention. It was one everybody had been expecting, and it could be worked in conjunction with existing systems, so that all who were connected with electric work would find themselves indebted to Professor Nernst. In the old days they had Maxim, Edison, and Swan; and some people thought one was going to kill the other, but instead of that they all helped the general advance. This was to a certain extent going back, for Swan first worked at a red, but he believed it was an advance which might benefit all connected with electricity.

Mr. H. Colefax said several applications for patents had already been put in, which appeared to claim the benefit of this discovery, but he did not think they would prove successful. With regard to the question of deterioration, he was told by Professor Nernst, some eight months ago, that, as far as he could discover, these lamps did not deteriorate in use; of course, this could only be proved by experience; but, if it were so, it would be very remarkable, seeing that in every other form of incandescent lighting yet tried there was this deterioration. He should be glad if Mr. Swinburne could tell them what it was which limited the life of the filament, because, when he saw Professor Nernst, he did not think he had then arrived at any explanation. He was astonished at the progress which had been made in the eight months since he first saw the invention; the limit then was 200 hours, the first experiments only having attained forty hours.

Mr. Campbell Swinton said Professor Ayrton was not strictly accurate in saying that this was the first attempt to use a heated electrolyte. Some twenty years ago, Jablchhoff showed a lamp in London consisting of a strip of kaoline, along the top of which he put what he called a match, which consisted, he believed, of carbon mixed with treacle; this conducted the electricity—100 volts—until it heated the kaoline, and that then formed the conductor. He would not go into the question of how far that was an anticipation of the present invention, he only wished to correct the impression that nothing of the kind had been tried. They must all admire the great advance which had now been made, and they knew that the Jablchhoff lamp never came to anything. With regard to the lighting power of incandescent gas mantles, he had made many experiments on them with cathode rays, by which you could heat them to a very high temperature without the use of gas in the ordinary sense, and he found there was no appreciable difference in the amount of light given by a mantle of pure thorium and one with the addition of a small per-centage of ceria.

Mr. Sydney Morse said he was interested in this question on the commercial side, and especially as connected with the competition of municipal authorities, who were now commencing to manufacture and sell electric fittings, which he feared would seriously interfere with the progress of invention. They had heard that invention in conjunction with carbon filaments was exhausted, but this opened up a new industry, which he hoped would be taken up and improved by English engineers and inventors, for they could not suppose that everything had yet been done.

Mr. J. G. Lorraine asked what amount of heat was emitted by this lamp compared with an ordinary incandescent one.

Mr. A. H. Dykes asked what was the power required for these lamps. He had been working out a scheme for street-lighting, and he found the difficulty was that, while arc lamps were too large, ordinary incandescent lamps were not a great success. The lamp appeared to have many advantages for such purposes, and particularly, the volume of light-giving

material being so much larger than a carbon filament, it would have much greater penetrative power in foggy weather. With regard to lighting up, a man could go round and apply heat underneath these lamps as well as he could turn on the ordinary gas lamps.

Mr. Swinburne, in reply, said the question of the temperature of a Welsbach burner was a very large subject, with which he could not attempt to deal fully. If you examined a burner with the mantle off, there was a zone of very high temperature, which would easily fuse platinum; but most measurements made were erroneous, because they were taken with a thermopile, which never got the real temperature of the burner. The great difficulty was to get what was in the burner to the temperature of the burner. In dealing with the light given by incandescent bodies it must be remembered that the light depended on the emissivity. If the only temperature at which you got much light was very high—very close to the temperature of the gas—you must use something of very low emissivity; if it were large, the heat given by the burner was rapidly given off; and, if infinite, the temperature of the mantle would remain at the average temperature of the room, and you would not get any light. On the other hand, if the emissivity were very low, though the mantle would get to a high temperature, it would not give light for want of emissivity. A pure white body, such as pure zirconia, gave very little light, because the emissivity was too low, though the temperature was high. To get the highest efficiency, you must have emissivity enough to give plenty of light without robbing the flame of its heat too soon. From a white oxide like thorium you did not get much light, but if you added a small percentage of ceria or some other coloured oxide—it did not matter much what—you got light. A great deal of unnecessary mystery had been introduced into the subject because it was known that ceria gave some curiously characteristic spectra, but ceria was only present as an impurity. Another point was that cerium had two sets of compounds, and it was supposed that it was continually hopping backwards and forwards from one state of oxidation to another. In dealing with a subject like this, he thought the proper way was to take a simple explanation if it fitted the case, and only if it did not go to a more complicated one. He saw no reason to suppose that temperature did not account for the results if it would fuse platinum, and if it would soften the mantle, as it would. In making Welsbach mantles—though, having advised the Company, he must not say everything he knew—they were sometimes raised to such a high temperature that they softened, and then they gave more light. Professor Ayrton had quoted several anonymous authorities, but had not given the reasons for their opinions, and so it was impossible to deal with them. They involved questions of thermo-dynamics, into which there was not time to go. The case of spongy platinum was altogether different, there was a chemical combination started by the heat, which would not otherwise take place. Here there was no reason to suppose there was such a combination, spongy black would give no light, and a solution of platinum put upon a mantle would destroy its light-giving power. He believed that colour was largely a question of temperature; but you could produce different colours by using different materials. The emission was the complement of the absorption. A blue body when heated gave an orange light. With regard to a vacuum, its effect was to get rid of convection. If you tried to heat a long, thin filament of carbon, it would be inefficient on account of convection; but, with a short, thick rod, the convection was not serious. Practically, he believed these Nernst lamps would not work in a vacuum. He had not tried many experiments himself, but so he was informed. The reason generally given was that electrolysis was going on, and that oxygen was being absorbed from the air at one terminal and being given off at the other. That was Professor Nernst's explanation, but he thought there was another factor to be taken into account. It was perfectly simple on paper to electrolyse salt and get out chlorine and sodium, but when you tried it you did not get either. The reason appeared to be that the chlorine and the metal were dissolved to some extent in the fused bodies, and got across very quickly. He did not think true electrolysis took place to any extent, but there was a continual diffusion of the substances across, which was undoing the work of electrolysis all the time; but that was not sufficient to make it work properly in a vacuum. All the lamps shown were on the alternate current, but he had tested them with the direct current and found their efficiency continued right through. That was some six months ago, when they lasted 200 hours; now they had got to 500 hours, and he had no doubt they would go much higher. He did not know anything about glow-worms, and doubted whether any one else did; but he did not think such questions had much to do with the matter, it was more a question of the red-hot poker order, quite simple. With regard to the emission of light at a given temperature, it was not the least likely that there was any such simple law as Mr. Maxim had suggested. The simple law would be as to the emission of power or energy. Light was only a certain small octave of vibrations that affected the human retina, it was not distinct from heat or the radiations of still higher frequency. It was not likely there was any definite law as regarded light; probably it depended, for one thing, on the eye looking at it. With regard to deterioration and its cause, after running some time the material appeared to get crystallised; what else happened he did not know. Probably there was a gradual tendency for the rod to get uneven; then it would get more heated in one part and softer, until at last it melted.



Professor Ayrton seemed to think that the compound in the Welsbach mantle was chosen entirely for giving light, but any one who used those lights knew that the strength of the mantle was of great importance. You could get a very good light from yttria, but you could not get a strong mantle that would not warp. The manufacturer had to consider strength, portability, and durability, and one point about that was that both the Welsbach and Nernst were at a very high temperature, just short of the fusing point, at which the material very slowly evaporated. If you took a thoria mantle and put lime on it, it would give a very nice light at first, but the lime would soon volatilise, so would many other substances. Ceria went off quicker than thoria, and the result was that, after running a thoria mantle with a small amount of ceria for some time, you had a pure thoria mantle. It was not that the power of the ceria was exhausted, but that it was not there. He did not know what caused the deterioration of the lime light, probably the lime really began to sinter together, and therefore you did not get the same temperature as before. He congratulated Major Flood Page on the exceedingly broad-minded view he had taken of the subject. With regard to the early Jablockhoff lamp he had no information. His own impression was that the Jablockhoff candle was the only thing which was at all successful; that was in use in 1878. There was another lamp which depended on a hot material between the poles called the Lampe Soleil, in which an arc was struck across a surface of marble which got very hot, and finally conducted and gave an illuminant surface. The cathode-rays experiments referred to by Mr. Swinton bore out what he had said about the earths, that it was simply a question of temperature. There was another inventor, he believed, working on a lamp with cathode rays, and no doubt they could be made to give an efficiency equal to the Nernst if the earths were raised to a sufficiently high temperature. With regard to the amount of heat given off, it depended on the amount of power used. If you took 100 watts, probably nearly 100 would go off in heat, as only a small percentage of the energy was converted into light, and, until Mr. Maxim and Mr. Mordey could tame their glow-worms, he was afraid it would always be so.

#### REPORT OF THE SOCIETY OF ARTS COMMITTEE ON THE EXHIBITION OF ACETYLENE GENERATORS.

THE following is the report of the Committee on the Exhibition of Acetylene Generators at the Imperial Institute (opened June 15, 1898). It is taken from the Society's Journal.

It being common knowledge that, amongst the large number of generators constructed and sold to the public, there were some which did not conform to the ordinary conditions of safety, it was felt that, in undertaking an Exhibition of Generators for Acetylene, to be held at the Imperial Institute, a preliminary test should be made of all the generators submitted for exhibition, and that the generators which did not satisfy the necessary conditions should be rejected.

The London County Council generously placed at the disposal of the Committee premises in the Harrow-road, where the preliminary tests of all the generators submitted were carried out; and the various forms of apparatus, as they were passed, having been forwarded to the Imperial Institute, the Exhibition there was opened on June 15, 1898.

Although beyond the scope of their instructions, your Committee felt that, in the interests of the public, it was advisable to carefully test the various forms of generator working for the period of a month, as it was possible that defects which might not be apparent in the test extending over a few hours might be detected on working over a longer period.

Professor Vivian B. Lewes and Mr. Boverton Redwood were appointed as a sub-Committee to examine into the working of the acetylene generators exhibited at the Imperial Institute, and to report to the Committee as to the results obtained and as to the generators to which certificates should be granted. The method adopted for testing is shown in Appendix C.\*

As the result of these tests, the Committee advised the granting of certificates for those forms of acetylene generators, a list of which is appended, the certificate, however, merely setting forth that the generator had complied with the requirements of the various tests to which it had been submitted, and had worked safely and satisfactorily during a month's every-day use.

The Exhibition at the Imperial Institute has clearly demonstrated that many types of acetylene gas apparatus can be so constructed as, with ordinary precaution, to be absolutely safe, and that lighting by acetylene need be no more fraught with danger than are any of the other forms of artificial lighting in general use.

In granting certificates to the various makers of apparatus hereinbefore mentioned, we wish it, however, to be clearly understood that such certificate can only apply to the type of machine examined and tested by us, and must not be taken as applying to all and every class of machine which may be offered for sale by the same makers. By type of machine is meant apparatus of the designs shown in Appendix E.

We consider that the various makers of apparatus who, at so early a

\* The Appendixes are printed separately, and are not given in the Journal. See note at end of Report.

period in the development of acetylene lighting, submitted their machines to the rigid tests as to safety laid down by your Committee, and have obtained certificates, are entitled to the first consideration from the public.

There may be other forms of generators, not exhibited at the Imperial Institute, which are perfectly reliable; but we strongly recommend that no machine should be purchased from any maker or dealer unless a certificate can be shown from some competent authority to the effect that it complies in substance with the rules laid down in Appendix B, and that it has been submitted to and has satisfactorily passed the tests indicated in that Appendix. In this respect fire insurance companies could render great assistance to the public in refusing to insure without such certificate being forthcoming.

General conclusions as to the working of each generator during the testing period are given with the diagrams. All the machines to which certificates were granted worked satisfactorily, some better than the others. It is only fair to state that, in the few instances where shortcomings are indicated, the defects were in many cases remediable, and that possibly, owing to the experience gained by the exhibitors during the testing period, they may have since been remedied. Apparatus, therefore, should not be condemned because during the trials the working in any particular case was not all that could be desired.

A point of considerable interest is the volume of acetylene gas produced per lb. of carbide used in each generator. Amongst the automatic generators there were three which gave over the whole of the testing period an average of slightly more than 4.5 cubic feet per lb., the remainder varying from slightly under 4.5 to as low as 3.55. Amongst the non-automatic generators one gave an average of about 5 cubic feet, the others showing much less.

The carbide of calcium used both at the Harrow-road and at the Imperial Institute was supplied in bulk by the Acetylene Illuminating Co., Ltd., from Foyers, and was found to be throughout of excellent quality. It was weighed out and supplied to the exhibitors by Mr. Duffield, the assistant appointed by the Committee.

Although it does not follow that the generator which yields the largest amount of gas is necessarily the best, yet this factor is a most important one in the choice of any apparatus. The generators which combine the largest yield of gas with strength of material and simplicity in charging the carbide, and in emptying the residue, are those which will recommend themselves to the public.

Where the public is most likely to be misled is by the exaggerated claims made by makers as to the number of lights which a given machine will supply, and herein may possibly be an element of danger due to excessive heating caused by too rapid generation. Even if there be no danger, the overheating will considerably lessen the quantity and lower the quality of the acetylene gas evolved from the carbide, as well as tending to cause smoking of the burners, as pointed out in Appendix F.

We recommend that every apparatus sold should be accompanied by a written guarantee that it will light a specified number of burners, consuming a given quantity of gas per hour, over a consecutive number of hours without increasing the temperature in any part of the carbide receptacle, above 228° C., that is to say, the fusing point of tin.

In regard to precautions to be taken we endorse the suggestions of the Public Control Department of the London County Council and of the Corporation of the City of London.

As to licences for storing carbide of calcium, we consider that local authorities need have no hesitation in granting such licences for storage provided it be shown to their satisfaction that the material is properly packed, and that it is intended to store it in some dry and well-ventilated place.

We consider that no carbide should be purchased without a guarantee that it is free from any impurities in quantities sufficient to cause danger, and the name and address of the manufacturer should be given on each package. It should also be guaranteed to give off an average of five cubic feet per pound of carbide when used in a good generator.

As will be seen from Appendix G, the Home Office regulations allow five pounds of carbide to be kept without a licence in packages of one pound each. We recommend that, however small the quantity, it should always be kept in closed tins or bottles, under lock and key, and in a dry place. When its properties are more fully known, these precautions may not be necessary, as it is no more dangerous than many other substances in daily use.

It was not within the scope of the work of the Committee to report upon portable apparatus and lamps to be used within the house. Your Committee, however, feel it their duty to state that, safe as they consider acetylene gas to be, when generated in a properly constructed apparatus outside the building to be lighted, and in accordance with the rules and suggestions contained in this report, they are of opinion that the generation of gas within the house is not unattended with danger, except in skilled hands.

As to cycle lamps, carriage lamps, &c., though requiring only small charges of carbide, we consider that great care is required in their manipulation.

We consider that non-automatic generators, with a holder capable of taking the gas generated from the largest charge of carbide the generator will hold, are free from objections attending all automatic generator



examined by us, and we are of opinion that every generator should be fitted with an arrangement by which all air can be rinsed out of the generating chamber by acetylene or some inert gas before action is allowed to commence between the water and carbide.

We are also strongly of opinion that every generator should be fitted with a purifying chamber or chambers, in which the acetylene is purified from ammonia and sulphuretted and phosphuretted hydrogen and from other impurities.

The thanks of the Committee are due to Mr. F. G. Worth, of the Acetylene Illuminating Company, for the help he has given them throughout the investigation.

#### LIST OF FIRMS TO WHOM CERTIFICATES HAVE BEEN GRANTED.

##### *Automatic Generators.*

The Abingdon Acetylene Illuminating Co., Ltd., 97, Great Hampton-street, Birmingham.

The Acetylene Beacon Light Co., Ltd., 59-61, Colmore-row, Birmingham.

The Acetylene Gas Corporation, Ltd., 100c, Queen Victoria-street, London, E.C.

The Acetylene Syndicate, Summer Works, Summer-lane, Birmingham.

Appleby & Harris, 2, Broadway, London-fields, London, E.

Bailey & Clapham, Eagle Works, Keighley, Yorks.

British Acetylene Gas Generator Co., Ltd., Kirkcaldy, Scotland.

Ehrlich & Graetz, Lausitzer Strasse, Berlin.

Exley & Co., Byram-street, Huddersfield.

Sir Charles S. Forbes, Bart., Castle Newes, Strathdon, Aberdeenshire.

International Industrial Syndicate, Ltd., 82-84, Bishopsgate-street, London, E.C.

Liver Acetylene Gas Co., Ltd., 4, York-buildings, Dale-street, Liverpool.

Manchester Acetylene Gas and Carbide Co., Ltd., St. Simon-street, Salford, Manchester.

Midland Acetylene (Parent) Syndicate, Ltd., Cradley-heath, Staffs.

Read Holliday & Sons, Ltd., Huddersfield.

Sardi's Patent Gas Generator Syndicate, Ltd., 25, New Broad-street, E.C.

Strode & Co., 48, Osnaburgh-street, Regent's-park, London, N.W.

Thorn & Hoddle, New Tophill-street, Victoria-street, London, S.W.

Thornthorpe's Automatic Lighting Syndicate, Ltd., 37, Vittoria-street, Birmingham.

##### *Non-automatic Generators.*

The British Pure Acetylene Gas Syndicate, Ltd., 19, Castle-street, Liverpool.

Ideal Gas Co., Ltd., 8, Tacketts-street, Blackburn, Lancs.

Pintech's Patent Lighting Co., Ltd., 88, Leadenhall-street, London, E.C.

Sunlight Gas Co., Ltd. (Goodwin's System), 18 and 19, Wellington-quay, Dublin.

The Report is also issued in pamphlet form, with appendixes giving particulars of the tests, diagrams of the apparatus, &c. The price is one shilling. It can be obtained from the Secretary of the Society of Arts, John-street, Adelphi, London, W.C.

#### TREATMENT AND USE OF ACETYLENE GAS.

At a recent meeting of the Society of German Gas and Hydraulic Engineers, Fr. Liebetanz, of Düsseldorf, gave some valuable information on the treatment and use of acetylene gas.

The principal points to be kept in view in advancing the acetylene industry, he said, were the purifying of the gas, its explosive features, burners, and the production of a high-grade carbide. Impurities in the gas originate from impurities in the carbide, and consist in ammonia, hydrogen phosphide and sulphide, ammonium sulphide, and sulphurous acid. These impurities amount to 2 per cent. of the volume in some cases. As a rule, there will hardly be any help for it but to purify the gas on its way from generator to the holder, by compelling it to pass either through suitable dry and porous material, or over moist chemicals, or through metallic solutions. Ammonia has to be removed first, and this is done by washing the gas with sulphuric acid. Next comes hydrogen phosphide, which is removed by means of copper sulphate, a solution of copper chloride, nitric acid, or chloride of lime, the latter in almost dry condition. It is highly important that hydrogen phosphide be removed, for it is one of the principal causes for the sooting of the burners and the musty smell of the gas. In the case of large plants, hydrogen sulphide and sulphurous acid will also be eliminated by either bog ore, or lime, or other suitable material. After its purification, the gas should be dried by means of sawdust, carbide, or calcium chloride.

The explosiveness of acetylene has been greatly limited by comprehensive investigation, and, if accidents of that nature do occur from time to time, they are chiefly due to carelessness, or to defects in the apparatus, or to the inferior quality of the carbide. All acetylene generators constructed at present work at a pressure of either less than one-fiftieth of one atmosphere, and the temperature in the apparatus rises rarely above 100° C. Under these circumstances, an explosion without exterior cause is rendered impossible by the inherent properties of acetylene. Not until exposed to a temperature of 780°, according to others of 1000°, does acetylene decompose, and the products of this decomposition are naturally of an explosive character. If the pressure

exceeds two atmospheres, it will explode instantly if brought in contact with an incandescent body.

At a pressure of less than two atmospheres the same contact will result only in a slight puffing-off of gas in the immediate neighbourhood without further change. Neither an electric spark, an open flame, nor even fulminate of mercury is capable of exercising any action beyond the region directly exposed to heating or pressure, if the latter do not exceed two atmospheres.

A mixture of 3 per cent. acetylene and air will explode in the presence of a burning body, and the explosion results when the temperature is at least 480° C. If more than 65 per cent. of acetylene are in the air and gas mixture, the latter does not explode, this being the critical explosion point. Compressed acetylene can be exploded by neither blow nor shock, no matter what force be used. A quart bottle of steel filled with acetylene compressed to from five to ten atmospheres did not explode when dropped from any height or broken by a ram engine. The height of the fall was gradually increased to 33 feet, and the weight of the rammer to 660 lbs., without having the least effect. It is evident that the danger from explosion of acetylene has been much exaggerated.

The burner question is the one least solved in acetylene practice. None of the present constructions fills the bill to entire satisfaction, as most of them make too much soot. In devising a burner three important points should be considered: first, to avoid heating as far as possible; second, to regulate the air supply most carefully; third, to see that the flame is in contact with the larger possible air surface. This is to promote the combustion of the carbon contents in the gas from which the bothersome soot in present burners chiefly originates.

As carburettor, acetylene has not been a success. It improves retort gas but little, and is too expensive, if compared with carburettors in common use. Attempts to enrich water gas by means of acetylene proved almost entire failures. Of most practical value is a mixture of acetylene and fat gas, as used for car-lighting on the Prussian State Railways, and about to be introduced on the other German railways. The proportion of the mixture is 72 per cent. of fat gas and 28 per cent. of acetylene. There are at present twelve large carbide factories on the European Continent.

WHILE the late Sir George Baden-Powell was not an astronomer, it will be remembered that he conveyed, on his yacht *Otaria*, the expedition to Nova Zembla to observe the total eclipse of the sun, August 9, 1896, when Mr. Shackleton secured his memorable photograph of the "flash" spectrum at the end of totality. The spirited and determined way in which he undertook to put the party in the path of totality at that remote station may be appreciated from some remarks in his description of the expedition before the Royal Astronomical Society, December 11, 1896 (*Observatory*, 20: 44): "In the first place, it was necessary, in my opinion, to get some qualified astronomers with their instruments to Novaya Zemlya. I happened to wish to go there for other purposes connected with meeting my old friend Dr. Nansen. Hearing that I could be of some service to science, I was glad to devote all the energies I possessed, and my ship, to taking these astronomers there. We had some difficulty in getting there in time, but, as has happened before in certain things we have undertaken in that good ship, we got there well in time." And, once arrived at this trying Arctic observing station, the heartiness with which he entered into the observations may be judged from some later sentences on the same occasion: "They entrusted to my charge the coronagraph, and all the members of my crew not only took their part with extraordinary willingness, but also showed great delight in what they considered an interesting observation, considering that they had their reward in being allotted positions around the instruments under the command of these distinguished astronomers. Right at the last moment, however, the siderostat would not work. It had been set up and thoroughly adjusted, but at the last moment, when the moon had got a long way over the sun, it would not work; and, looking through the coronagraph telescope, I saw the image pass steadily but surely across that bit of ground glass which we all watched so anxiously, and nothing that the devoted energy of Mr. Shackleton could do would make it work properly. This happened almost up to the point of totality, but, with the dash of genius, Mr. Shackleton certainly went for that siderostat with what we uninstructed persons would call rashness, and dashed back into the hut saying, 'That will do;' and it did do. I saw the image in the centre of my ground glass, which I had then to take out and begin the series of photographs I had been instructed to take at various intervals during totality; and I think one of the happiest moments of my life was when, somewhat dazed, because immediately after totality the burst of sunlight was so great, I had sufficient senses left to slip in the ground glass to see where the sun had got to, and saw our old friend right in the centre of the field." Commenting on the inadequacy of the appropriations of public money for eclipse expeditions, he added: "But I do say for myself—and I have a special command to do so for my wife—that if ever a yacht is wanted to take willing people to see another eclipse, they will know where to find it, if we are free then." Surely this was an expedition that deserved to succeed so brilliantly in the midst of general failure due to bad weather.



# MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."]

[April 7, 1899

# THE LANTERN RECORD.

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## LANTERN MEMS.

"It is fourteen years since I showed the members of this Society the improved projection microscope I designed with the view of getting better results than could be obtained by the patterns then existing." Such in substance was what Mr. Lewis Wright said to the audience at the Quakett Club a week or so ago, prior to a demonstration he gave. He then proceeded to explain the development of the instrument since that time. Generally speaking, the improvements consist in making the apparatus stiffer, so as to secure steadiness, an increase in the aperture of condensers and objectives, and the use of improved eyepieces.

MICROSCOPISTS, and those who contemplate using projecting microscopes, will do well to remember that all the best work is now done with eyepieces, whereas in the earlier models the projection was made direct from the object-glass, and sometimes with the addition of amplifying lenses. It is a coincidence that at the time when negative eyepieces in field and marine glasses are giving place to telescope eyepieces, in connexion with the Porro lenses employed for shortening the length of the instrument and reversing the image, the concave amplifier of the projection microscope is put on one side for the compound eyepiece.

THOSE who witnessed the demonstration at the Royal Institution by Sir David Salomons, some three years or so ago, will remember how fine the definition of the enlarged image was, by eyepiece projection, in comparison to that by amplifier, and now Mr. Lewis Wright obtains an increased field of view by modifying the projection eyepiece. Instead of the small field lens, generally fitted to this form of eyepiece, a meniscus lens of the full aperture for the tube employed is used, and in consequence a much larger field obtained, with very little loss of flatness of field.

To be able to project an object so that it is magnified when on the screen to 2500 diameters with the limelight is an achievement, and, if the electric arc light is employed, and an objective of half an inch equivalent focus, a magnifying power of 5000 diameters can be obtained. It was shown that many objects appear much more distinct when on the screen if projected with a low-power objective

and a high-power eyepiece, while others are better with a moderate or low-power eyepiece. It will thus be understood that a selection of eyepieces is necessary if the particular object being shown is to be projected at its best.

In order to obtain the widest angle of light possible, four lenses are employed for the lantern condenser, and a modification made in the lens for parallelising the light, while the optical system generally is rearranged so as to secure the greatest freedom from spherical aberration. Altogether, the demonstration by Mr. Lewis Wright left little to be desired. In large rooms it is almost impossible for those of the audience some distance from the screen to see the detail of the microscopic objects, hence the great value of an opera-glass being employed in order to appreciate the projections. This remark also applies to many demonstrations of a scientific character, especially those given at the Royal Institution, and with members of the latter it is very usual for them to use a binocular glass.

THIS was forcibly brought to mind at the last Friday-evening meeting before the Easter vacation, when Lord Rayleigh lectured on "Transparency and Opacity," and in the course of same produced a spectrum by means of a new spectroscope, showing the double-sodium lines. This was possible by using ten prisms arranged in a length of twenty inches, giving great dispersion. It was explained that a variation of temperature quite upset the results obtained by the bisulphide prisms, owing to the hotter air refracting the rays less, whereas with the new prism the error was corrected by change of focus, a small variation of 5° F. or 2° C. being quite sufficient to spoil the projection in these delicate demonstrations. By placing the prisms so that the apex is downwards or vertical, instead of horizontal, as in the bottle form, the difficulty is surmounted.

As an illustration of opacity, snow flakes were mentioned as particles through which light was not transmitted or only refracted to such a small extent that they look as objects seen by reflected light only. When, however, they began to melt or are of a rainy order, then light passes freely, for the interstices are filled with a fluid more nearly approximating to the density of air; and then, as an experiment, he showed that particles of broken glass in bulk would not allow light rays to pass, but, when the vessel containing them was filled with a fluid, such as cedar oil and bisulphide of carbon, then the light passed freely.

THIS has an important bearing on achromatism, for it was shown to be possible to so use glasses of different densities and fluid combined that made the refractive index of the whole very uniform. Bisulphide of carbon and benzole gave practically equal indices of refraction. A simple experiment, to show achromatism, was made with two prisms, one of crown glass that refracted the white light



as a spectrum to the right, and another prism of flint glass that refracted to the left. These were so proportioned for density that, when placed together, an achromatic prism was produced, and the beam, although deviated to the right, was white light.

A CORRESPONDENT recently, in THE BRITISH JOURNAL OF PHOTOGRAPHY, questioned the colour of calcium carbide residue as indicating the heat to which it had been subjected during the process of decomposition while liberating acetylene gas. As my remarks were based on the statement of Professor Vivian Lewes in his lecture at the Society of Arts, I now quote from notes made at the time, viz.: "Lime tells the tale of the temperature: white lime deposit, 400° C.; if yellow, 600° to 770° C.; black, over 780° C."

A POSSIBLE explanation of some black residue not yielding any more acetylene after further immersion in water is that it becomes coated with a tarry or protective coating. As Professor Lewes says, "the acetylene generated has to pass through the external layers, which, as shown, may be at a temperature above the point of its decomposition, and it is under these conditions that a considerable volume of gas is lost, and the tar, often found in the residue, or distilled out in the generator and tubes, is formed." The italics are mine.

G. R. BAKER.

#### STEREOSCOPIC PROJECTIONS.

For the benefit of those among your readers who take an interest in projections I am going to explain a very easy way of causing them to appear "solid"—that is in relief—which greatly adds to the attraction of the now familiar entertainment.

Two lanterns—yours and one borrowed from a friend, for instance—two

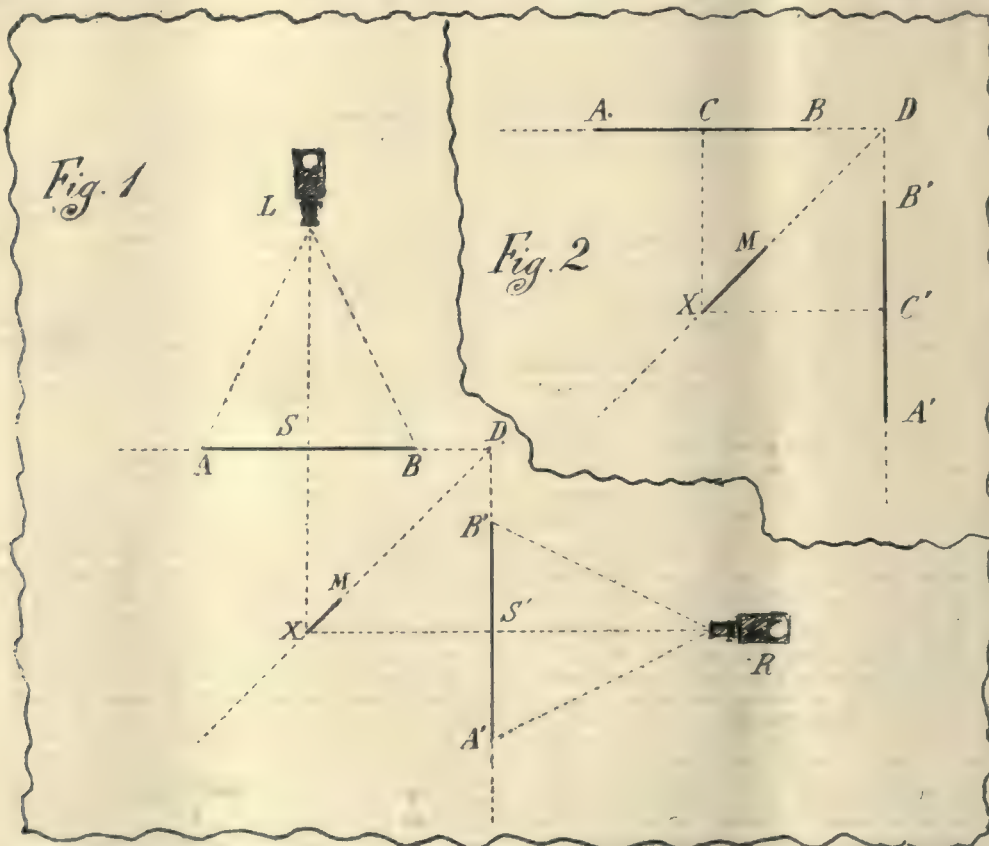
Place the two screens, S and S', at right angles to each other, and some distance apart (fig. 1), situating the lanterns, R and L, so that the images they project may fall one on the back of each screen (as they are to be viewed by transparency), and, in order that the said images be of exactly the same size and also in such a way that the optical axes of the lanterns cross each other in a point X, which must lie on the vertical plane which bisects the right angle formed by the two screens. The spectator must place his nose (this sounds comic, but it is the simplest way of putting it) at X; and the mirror, starting from X towards D, is to coincide with the bisecting plane just named, and must have its reflecting surface facing S'.

Now let us suppose the spectator in the said position, in which he will have the left eye seeing outside the mirror, and the right eye looking into it; insert the left slide in lantern L in the usual way (*film facing screen*) and put in lantern R the "right slide," with the film towards the condenser; the view (from the left slide) will be seen in the ordinary position on screen S, and the same view (from the right side) will appear reversed on screen S', that is with right changed into left, and *vice versa*. If he now looks straight before him, his left eye will see the view on S by direct vision, and, as the mirror X M forms an angle of 45° with either screen, the right eye looking into it will see the view on S' in its normal position, which will cause it to immediately coincide stereoscopically with that on S, thus forming a wonderful, solid, lifelike rendering of the whole, the right-side image virtually appearing at A B, but without being visible to the left eye or in any way interfering with its vision, as the mirror X M completely prevents either eye from seeing anything but what it is particularly intended to see. A small opera glass may be used where sight is defective.

The mirror can be made to pivot on a vertical axis at X to allow for differences of separation between the eyes of the various spectators.

It is not necessary that the lanterns should be identical, no more than their lenses; but it is necessary that the projected images should be of exactly the same size, otherwise the stereoscopic superposal would be impossible.

Although I have practically seen that any lanterns, lenses, slides, and



screens, a small hand mirror, and of course the positive transparent stereoscopic slide, cut in two (so as to have a "right slide" for the right eye, and a "left slide" for the left), are the only items necessary for the performance.

mirror will "do," it may be interesting to mention that I usually take the views with Anschütz's stereoscopic camera, fitted with Goerz lenses (f-7, 7), and employ for the projections a couple of Ross's new universal combination lanterns, quarter-plate size, lighted by Ross-Hepworth electric arc



lamps, and to which I apply either a pair of Ross's extra-rapid symmetric anastigmats ( $f=5, 6$ ), or else the same Goerz lenses used in taking the views. My mirror is an optically plane one, also by Ross.

It will be objected that little or no superiority can be gained by this method over the stereoscopic effect produced by the ordinary stereoscope, since, owing to the magnifying power of the latter's lenses, the images are seen in what appears to be "life size," because the viewed image can be made to coincide with the real object by looking with one eye at each. To this I reply that my system will always have one advantage over the other, viz., that the objects on the first plane can *very often* be projected to real "life size," which in many instances—for example, in the case of a portrait—produces quite a startling effect.

A similar contrivance, founded on the same principle, can be used to view stereoscopic transparencies of large size—whole-plate for instance. In this case the plates are placed vertically, as shown in fig. 2, in which A B is the left picture and B' A' the right one, which should be reversed. The distance between plates and mirror is of no consequence whatever, provided the four points X O D C' form a square (C and C' being the approximate centres of A B and B' A'). A light behind each plate will, of course, be necessary, as well as a ground glass to soften its brilliancy.

These transparencies may be either enlargements to any size, from ordinary stereoscopic slides, or they may be made with two cameras placed together, or else with one camera properly shifted when taking the second of each pair of photographs. I have taken a great many very successful ones with two whole-plate cameras fitted with splendid Zeiss's convertible single anastigmatic lenses of  $16\frac{1}{2}$  inches focus, and with Thornton-Pickard time and instantaneous shutters set at the same speed and worked by a single pneumatic ball.

The results thus obtained are generally far superior to those given by the ordinary stereoscopes, since the grain of the emulsion is quite done away with, which gives a fineness of detail impossible to obtain otherwise. In the case of objects taken full size, as flowers, insects, small animals, jewellery, and many objects of art, the effect cannot, to my knowledge at least, be superseded by any other method in existence. Landscapes and seascapes likewise appear vastly improved.

A pair of magnifying spectacles can, of course, be used when necessary or convenient.

To conclude, I scarcely need add, it being obvious, that the mirror can be used by either eye in all cases, provided its reflecting surface be placed towards the reversed picture, which must evidently always correspond to the eye in question.

M. DE RISCAL.

### STEREOSCOPY ON THE SCREEN.

MANY have been the attempts, in recent years, to revive an interest in that once most popular instrument, the stereoscope. At one time no drawing-room was considered complete unless one of these contrivances was provided, and it was looked upon quite as much as a necessary as the inevitable piano. Attempts also have not been wanting to project stereoscopic images upon the lantern screen, and some important experiments in this direction are too recent to need much remark. Such attempts have generally necessitated the employment of two lanterns, so that two images may be superposed, and means provided that one eye only can see each image, as in the ordinary table stereoscope. This has been achieved in various ways. For example, the left and right-eye images may be flashed alternately upon the screen by means of a revolving sector in front of the lantern lenses; or the two lanterns may throw images of different colours on the screen, to be viewed by the spectators by means of coloured spectacles. Lastly, we have the method of using polarised light for the projection of the images, and viewing them by means of suitable spectacles.

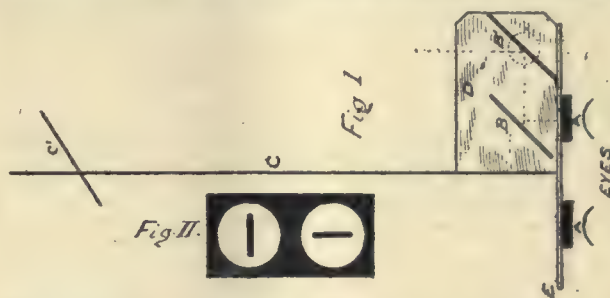
Mr. John Henry Knight, of Barfield, Farnham, has accomplished the projection of stereoscopic images in a far more simple and inexpensive manner, and employs one lantern only. His method formed the subject of a paper read before the Camera Club on Monday, the 27th ult., and the successful demonstration which accompanied the reading of the paper was highly praised by an appreciative audience.

Mr. Knight throws the two stereoscopic images side by side on the lantern screen, so that together they cover the space occupied by an ordinary lantern slide, and they are then viewed by a special form of "scope," which each of the spectators holds in his hand and applies to his eyes. The construction of this appliance, which is of an extremely simple character, and does not employ lenses or other expensive fittings, will be readily understood on reference to fig. 1, which is a plan of the apparatus. D is a flat board, measuring about four inches by two and a half inches, and against it is a vertical face plate, x, which is pierced with two eyeholes, a, a. On D are two mirrors, B and B', the latter being fixed on a central pivot, so that it can be adjusted to suit different sights. C is a diaphragm, or screen, of blackened cardboard,

which has a length of about one foot and a depth of three inches, and it has at its further end an adjustable piece of the same material, c'.

A "scope" of the above construction having been handed to each person present, a double disc diagram, as shown in fig. 2, was projected upon the screen, and the spectators were instructed to adjust their mirrors until the two images coalesced and the vertical and horizontal bars upon them formed a cross. This having been done, various examples of stereoscopic photography were thrown upon the screen, and stood out with marvellous solidity.

As Mr. Knight was careful to explain, the centres of the two pictures on the screen were about four and a half feet apart, and therefore special means were required, not only to throw the images stereoscopically, but to adjust those images for every one present, whether near or far from the screen. This is secured by the adjustable mirror, B', and the diaphragm or screen of cardboard, c. The end piece, c', is not required at all if the spectator be near the projection sheet; but, if he be at a distance of, say, more than twenty feet, then the extra piece, c', becomes necessary to screen off other visual images which may become intrusive.



There is naturally a certain loss of light entailed by the use of this scope, but at the Camera Club, where the lantern is an electric one, there is plenty to spare, and the loss did not become apparent. A greater objection was found in the dwarfing of the image, which Mr. Knight attributes to an optical illusion. As he puts it, "There appears to be a dwarfing of the image altogether by viewing it through a mirror or even a tube; the same is noticed when one first looks through an astronomical telescope, say, at the moon. Although the telescope may magnify linearly fifty or eighty times, the moon appears to be only fifteen or twenty times larger than one is accustomed to see it with the naked eye. Again, to expect to see the stereoscopic views on that screen as bright and as large as an ordinary lantern slide would be something like expecting to see all the detail in an ordinary stereoscopic view, two and three quarter inches square, that one would get in a  $12 \times 10$  photograph." Mr. Knight concluded his remarks by expressing the hope that we should one day be able to see animated pictures on the screen, not only stereoscopically, but also clothed in their natural tints.

Mr. Knight's apparatus may be regarded as a most useful contribution to the solving of a problem that has engaged the attention of many thinkers. It gives as good, if not better, results than any contrivance previously devised; and it may be mentioned that the pictures which he showed were by no means of the best, many of them having been copied from paper prints. Indeed Mr. Knight apologised for having been unduly hurried in his preparations for the demonstration, an apology which was readily accepted when he added that his principal object was that the Camera Club should have first view of the results which he had obtained.

### COLOURING LANTERN SLIDES.

#### III.

HAVING accomplished the tinting of a slide in the manner described in a previous article, it is then subjected to a drying operation, or what is perhaps more properly termed a hardening of the colours that have been laid on. At this stage the greatest possible precaution must be taken to avoid dust, in fact all through the work dust is very liable to give a considerable amount of annoyance. During the operation of colouring, a speck of dust or a small hair is easily got rid of by means of the point of a dry brush, but this, occurring when the slide is only partially completed, seldom gives as much trouble as is the case when the slide is quite completed and all the blending has been nicely accomplished.

As a rule, even any one moving about a room where colouring is being conducted is quite sufficient to raise a plentiful crop of those annoying little hairs or specks of dust which seem to take an especial delight in settling down just on the most vital parts of the slide. A worker should therefore take such precautions as will avoid any of these annoying visitors.

For drying a slide, perhaps there is no more convenient method for an amateur worker, or one who merely does a few slides now and again, to adopt than that of placing the same under a glass shade, such as are in use as bell glasses in a garden. The application of more or less heat



is sometimes recommended to accomplish this drying operation more rapidly, but my experience has taught me that this is a mistake, for it generally does more harm than good by introducing dirt. The best method, in the writer's opinion, is to select a warm room and to cover the slides with the bell glasses, leaving them undisturbed until the colours have got somewhat hardened. This operation of drying will, of course, vary according to the nature of the pigment used in colouring, for some colours are much better driers than others, and some workers can colour a slide by means of dabbing, using the necessary pigments in a much drier or harder condition than others. The introduction of a little mastic varnish with the pigments used will generally help to dry a slide within a reasonable time. On the other hand, although megilp is an invaluable vehicle in many ways, it does not dry nearly so rapidly as mastic varnish.

Some workers prefer to treat their coloured slides to a binding operation by employing a cut-out mask slightly larger than the one it is eventually intended to employ. This mask is laid over the wet painted surface, when a cover glass is bound on in the usual manner and set aside to harden, but this method does not permit of as much air reaching the surface of the slide as the bell-glass method, and there is a strong liability of dust settling down on the slide during the time it is being handled for binding on the cover glass. It has, however, many advocates and is largely practised.

After a slide has become nicely hardened, it has then to receive what may be termed "the finishing touch," for up to this stage it will present a somewhat oily or grainy appearance, lacking in the brilliancy and sparkle which is so apparent in all high-class coloured slides.

To obtain this desirable result the hardened slide has now to be varnished, and it is just here that a little knowledge is so necessary to successful results. For a long time I got along all right in this work up to this finishing stage, where, as a rule, books of instruction fail to guide a beginner in the work, and so I set myself to reason the business out, and, as the result of many trials with varnishes of all descriptions, I finally hit upon the following, which yields a magnificently clear appearance to a slide that has been coloured by means of oil pigments.

To prepare this varnish two ingredients are necessary; first, a quantity of Canada balsam, in the condition used for mounting microscopic objects. Any optician will supply this in small bottles, and a little of such will make quite a large quantity of the mixture we are requiring. The other ingredient is our good old friend, turpentine. This must be of the purest possible quality, into any quantity of which sufficient of the Canada balsam is added to provide a thinnish varnish. It will take a little practice for any one to mix this just to the proper consistency, but after once hitting the proper quantities, which is best judged by the manner in which it flows over the surface of the slide, such is known for all future time. After mixing, the varnish should be allowed to settle for several days, so that any impurities may go to the bottom. The upper portion is then decanted off into an absolutely clean bottle free from all dust, and, whenever this operation of varnishing is being performed, this arch enemy, dust, must be guarded against at all costs. If properly made, this varnish will preserve a beautiful water white appearance and flow on the slide with a delightfully even wave. In applying it, however, to the surface of a coloured slide, a few words of caution are necessary, for it must be borne in mind that, seeing an oil pigment has been used, and that turpentine is a strong thinner or solvent of such pigments, the application must be effected so as to avoid any deterioration of the coloured image, and, strange as it may appear to some minds, this thinning property of turpentine is invaluable in the operation we are considering, for it not only tends to further blend all the colours nicely together, but, in conjunction with the Canada balsam, it imparts a beautiful sparkle to what previously was a misty oily appearance.

When applying the varnish, it must be poured on in one corner, and the varnish caused to make a rapid flow without stopping over the entire surface, pouring off the surplus varnish into another bottle.

At all costs this operation must be performed cleanly, and any of this surplus varnish should not be employed until it has again settled and been decanted.

In about five to ten minutes' time, after the slide has been varnished, it will, if held a slight distance from a clear, bright fire, have become sufficiently hardened to bind up and finish under a cover glass.

No sooner has any one for the first time conducted this operation of varnishing than he will have observed that, after the varnish has been applied, the previous depth or density of the pigments will have become considerably lowered, so that an experienced worker will readily know how to allow for this reduction when laying on the tints in the first instance.

To attempt to enumerate a tithe of the various kinds of subjects that fall to a colourist to deal with would be impossible, therefore only a few of the leading subjects can be dealt with in articles of this description. As a rule, landscapes must be dealt with according to their seasons, and not too much labour expended upon the introduction of cloud effects, for these may be obtained in a marked degree by introducing or blending such effects as sunrise or sunset with the three colours named and used in conjunction, viz., Prussian blue, crimson lake, and gamboge, and, when they are introduced to provide any special effect, their use alone will impart quite a sufficiency of atmosphere without introducing any clouds into the picture.

Among other subjects which are specially amenable for colouring in lantern-slide work may be mentioned such pictures as mottoes and introductory slides, examples of which we see in "A Merry Christmas" slide. In pictures of this description there is an illimitable scope for the exercise of taste, not only in designing the original black-and-white sketch or block picture, but likewise a very wide range of effects to be produced at the hand of a colourist. A common form of such a slide may be described as follows: a well-chosen floral design, such as a wreath of flowers composed of Christmas roses (the *Helibore Niger* of our gardens), is made to form the main feature of the picture, into which is introduced the customary Christmas greeting, and over all is shown the figure of a robin, with his little bill partially open, warbling his Christmas welcome. A slide of this description is by no means difficult of production. The floral design is first tastefully drawn in line on a pure white card, care being observed not to fill in the parts as are eventually to appear in a brightly coloured form, such as the pinks and reds and greens of the coloured slide. By this means the negative will print the glass positive in such a manner that these parts are represented by bare glass in the slide, and, of course, any transparent or semi-transparent pigments will work over the parts much better and yield greater brilliancy than were those in the positive showing any reduction of silver.

A design of this description can be nicely executed by first introducing a round centre or patch of crimson lake, meeting which and running out to the edges of the slide is a nicely graduated edging of Prussian blue. The latter colour is first laid on and dabbed similar to the working of a sky, so as to appear darker at the edges, and blending or shading gradually away until the point where it meets the crimson lake.

The floral design represented by the Christmas roses is nicely tinted by using a mixture of gamboge and Prussian blue, for the leaves in a picture of this description are generally represented as of holly, with a charming bunch or two of red berries. The roses are easily tinted a very pale pink. The robin, together with the lettering, is attached on the original sketch for the purpose of yielding the negative. The breast of the robin, of course, is easily matched with a mixture of gamboge and crimson lake, with just a *souppçon* of burnt sienna.

Such a subject as the above is perhaps one of the very best any beginner could select as his first trial subject in lantern-slide colouring, for it embodies three primary features, viz., dabbing, brush colouring, and blending, and when these are completely mastered a worker may be said to be proficient.

T. N. ARMSTRONG.

#### A VISIT TO THE SCOTCH AND IRISH OXYGEN COMPANY'S WORKS AT POLMADIE.

It is extremely gratifying to be able to place on record the fact that another lantern season has passed without the slightest form of accident having to be noted in connexion with the employment of compressed gases in cylinders, and this in the face of a largely increased use of them, both in connexion with cinematographic and lantern projection. This fact strongly confirms the wisdom displayed in framing such a stringent set of conditions which governs the conduct of the various oxygen companies that now cater so successfully for the public requirements in limelight projection, but probably very few even of those of whom it may be said that they take an active interest in limelight work really know the extent of the precautions taken by those in charge of our oxygen-manufacturing companies, for at every turn safeguards against an accident of any description are imposed, until it may be truthfully said that, so far as human foresight is concerned, there is no possibility of an accident occurring from the employment of compressed gases in cylinders, and without the intervention of some criminal or wilful intent an accident is an impossibility.

A visit to any of our gas-compressing companies' works must at all times prove a matter of considerable moment to those taking an interest in limelight work, and it was with no little amount of curiosity and pleasure that the writer, on the invitation of Mr. Carty, the courteous manager of the Scotch and Irish Oxygen Company at Polmadie, near Glasgow, recently visited these extensive works, where everything in connexion, not only with the manufacture of the various gases is being daily carried out on a very extensive scale, but likewise the testing of new and old cylinders is most scrupulously attended to. The Company employ a very large staff of skilled mechanics, who are regularly engaged in making the various cylinder valves, fittings, &c., as well as turning out a large supply of automatic regulators and fine adjustment valves for the regulation of gases, all of which are of the most recent pattern.

To attempt to describe the entire precautions which are taken at every turn for the public safety in connexion with the charging of cylinders would be a difficult task. It may, however, be briefly stated that no cylinder is permitted, under any pretext whatever, to reach the pumping room without first going through the inspection or test room, and every cylinder on arriving at the works is first carefully inspected by a skilled workman, who, by means of private marks upon the cylinder, is enabled to say definitely the period that has elapsed since such a cylinder was not only tested, but reannealed, and any cylinder coming under his



observation that does not bear upon its shoulder the required proof of this important safeguard is at once set aside as being ineligible for charging with gas until it has not only been reannealed, but at the same time has been subjected to the required pressure, viz., 3360 pounds per square inch.

This testing is a very important part of the routine at the Scotch and Irish Oxygen Company's work, and a description of how an uncertified cylinder is tested will, no doubt, prove of interest to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY.

All cylinders which do not bear the required test mark are placed, one at a time, in a water jacket. This may be described as a deep, narrow well sunk in the earth below the level of the ground, the cylinder standing on end, nozzle upwards, just above the surface of the water. When the cylinder is inserted in the water jacket, a very strongly made collar is caused to surround the shoulder of the cylinder and at the same time also enclose all parts of the jacket. This collar is held so firmly down by means of an hydraulic pump as to prevent any escape of the water upwards from the jacket. When the cylinder is firmly gripped by the hydraulic collar and pump, pressure is applied to the cylinder, and as the pressure increases, which is easily seen by referring to the gauge attached to the pressure tube, the cylinder, if in good condition, expands, and, in consequence of this expansion, the water in the jacket is forced up in a glass gauge, which at once shows the amount of stretch the cylinder has yielded, and, when the gauge indicating the pressure has reached 3360 pounds per square inch, the pumping is stopped and the stretch of the cylinder noted.

On the release of the pressure on the cylinder, the stretch is again carefully noted, and any cylinder that does not return in elasticity to its original dimensions, as previously indicated on the low-pressure gauge, is at once rejected as unsafe and probably requiring reannealing.

The time taken in testing, say, a forty-foot cylinder in the manner described is about ten or fifteen minutes, and all the various gauge tests are carefully noted in the record book, where the performance, and date, and history of every cylinder in circulation is carefully recorded. It is quite surprising how the officials of the Company can give the history of almost every cylinder that leaves their works. They can even form a very good guess as to the particular kind of use, such as theatrical, or optical, or medical employment any cylinder has undergone, even to the names of those who may have used and had charge of the cylinders for years back, and the genial Manager (Mr. Carty) facetiously remarked, on the occasion of our visit, that, as a rule, showmen took better care of their cylinders than any one else.

After being tested and marked, the cylinders are passed on into the charging room. Here similar precautions are taken to prevent even the slightest possibility of any errors, and it is abundantly evident that the precautions imposed some years ago, on the occasion of the bursting of a cylinder from the effects of the mixed gas it contained, have, for once and all, placed a repetition of such a calamity beyond the pale of possibility; for, with the means now employed, it is quite impossible for even a careless workman to pump hydrogen into an oxygen cylinder or *vice versa*. Within recent years fresh and improved pumping machinery has been laid down, and by this means all pumping connexions are fitted with blow-off or safety valves, the effect of which, even supposing a workman from neglect, failed to release a cylinder until it was overcharged, is that the safety valves being self-acting, blow off when a pressure of 1800 lbs. per square inch has been reached, and as many as six or eight cylinders can be charged from the one pump simultaneously, so that the time taken to charge a cylinder does not occupy many minutes.

In striking contrast to the present method of charging cylinders it is interesting to recall the practice that prevailed in the United States, where cylinders were first introduced. In the early days of iron bottles used for storage of compressed gas, resort was had to hand pumping, and it took some labour and time to get a twenty-foot supply at a pressure of even 25 lbs. per square inch, a period of over half an hour being required to pump such a quantity by means of the hand.

In America, however, the cylinders were never charged to anything like the same extent that has been in practice in this country; but, with the excellent quality of soft steel used in the manufacture of the cylinders, the pressure in this country can certainly not be deemed excessive. The lower pressures originally adopted in America were based upon quite a different class of cylinders to those employed in this country; but the fact remains that, with the great precautions which are now observed, not only in regard to every new cylinder, but likewise as bearing upon those of older construction, 120 atmospheres is quite within the lines of safety, and this has been abundantly proved by experience.

It is not only, however, in connexion with what may be termed the cylinder shell that the utmost precautions are taken. The same applies, under Mr. Carty's supervision, to every detail in connexion with the valves and cylinder fittings, each and all of which are made and fitted on the Company's premises, under his special observation.

When cylinders were first introduced, there were not wanting those who predicted utter failure of the system by reason of the difficulty of delivering the gas from the cylinder to the jets at anything like a regular pressure, and some of the best and most experienced lanternists in the kingdom gave it as their opinion that it could never be accom-

plished satisfactorily in cases where cylinders were charged to a pressure of 120 atmospheres.

This desirability was soon appreciated, and as early as 1884 a form of regulator was patented; this was followed by several other forms of governors, notably those of Beard's and Clarkson's, both of which, it may be said, at once removed the only real objection that could be urged against the use of gas direct from the cylinders.

The early forms of these governors, although in reality quite effectual in working, were liable to injury by reason of rubber being employed in their construction; these in turn have been followed by the more modern form of regulators, of which one of the best is that of Briers' metallic, in which rubber is entirely discarded; and this is the form of regulator that the Scotch and Irish Oxygen Company have specially adopted and which they manufacture on a very extensive scale. All regulators, from the very first, by reason of the fineness of fittings required, have naturally been more or less expensive; but the Scotch and Irish Oxygen Company have made a fresh departure by arranging for a system of hiring out, at a merely nominal charge of sixpence for each regulator per night, instruments of guaranteed perfection, and no regulator is permitted to leave the works without first being carefully tested for efficiency.

In addition to the manufacturing of these regulators on a very large scale, the same Company has placed upon the market a very efficient fine adjustment valve that has become very popular in the hands of expert lanternists.

To any one taking a keen interest in lantern projection a visit to the Scotch and Irish Oxygen Company's works at Polmadie must prove not only interesting but highly instructive. Certainly a visit to such places would do more than anything else to dispel any latent fear or idea of danger in connexion with compressed gas in cylinders than anything else we know.

#### IMPROVEMENTS IN LIGHT-HOUSE APPARATUS.

At a recent meeting of the Institution of Civil Engineers, a paper on "Improvements in Dioptric Apparatus for Lighthouse" was read by Mr. W. T. Douglass, M.Inst.C.E., and Mr. J. A. Purves, B.Sc. The paper was devoted to a description of the advantages secured in practice by the *feux-éclairs*, or "lightning lights," introduced by Mr. Bourdelles in 1890, and to an investigation of the financial aspect of improvements effected, from which it appears that a more efficient and characteristic light is obtained at a greatly reduced cost.

It is universally admitted that, sufficient power being granted, the fixed light is, from the point of view of visibility, the light *par excellence*. It is kept constantly in view, and a bearing can be taken from it, and a course steered to it, with absolute certainty when it is once picked up. The same statement could not be made with reference to a slow revolving light; there is so long a period of time between light and darkness that the sailor is apt to lose patience; and, if he happens to miss one or more flashes from any cause, as, for example, from the vessel falling into the trough of the sea, or from the obscuration of the light by masses of spray, or even possibly by a passing vessel, his nerve may become unstrung and a disaster result. This danger and difficulty the *feu-éclair* readily surmounts, as its lightning flash or flashes, occurring every five seconds with persistency, render it for all practical purposes a fixed light, while it confers the further advantage of a positive characteristic.

There was a waste of light when it was allowed to rest on the eye longer than the time necessary for complete perception, which period was one-tenth of a second. Light might be economised so that greater intensity should be given to the beam emanating from the apparatus. This is the underlying principle which governs the system of illumination by *feux-éclairs*. Elaborate experimental investigation has been made, notably by Charpentier, to determine the exact time which an intense ray of light falling on the retina requires for full perception. This time is between 0.08 second and 0.125 second. A mean between these periods was accepted for working purposes, and the French light-house service accordingly fixed the standard duration of a flash at one-tenth of a second. In future, therefore, this law determines the maximum effect of an optical apparatus, and any "wire drawing" of the flash beyond these limits means want of economy and a diminution of the efficiency of the light. In both systems it is equally easy to produce group-flashing lights by the simple expedient of breaking up the faces of the panels.

The commercial aspects of these new lights, dealt with in three tables, are calculated from Mr. Allard's formula. As is well known, the actual candle power of a light as arrived at by photometric experiments is much less than that given by this formula. The object of the authors in giving these tables was, however, to institute a comparison between new and old forms, and for this purpose Mr. Allard's formula was available. The undesirability, from an economic point of view, of using the old form of apparatus is made obvious. Compared with hyper-radiant apparatus with six sides, *feux-éclairs* of the first order, with corresponding two panels of 155°, showed a saving of no less than 1784; while, compared with a hyper-radiant with three sides, each side giving a group of two flashes, *feux-éclairs*, with a group of two flashes, two panels of 135° each showed a saving of 3000.



The new system of *feux-éclairs*, instead of the hyper-radiant, could thus be employed with a great saving of cost. Thus, in place of the gigantic and expensive hyper-radiant, such an apparatus as that installed during last year at Armen, on the west coast of France, could be set up. This apparatus is of the second order, and the luminary is an incandescent gas light. The gas is formed from mineral oil and is under pressure. The light of this apparatus is equal to no less than 300,000 candle power, while its cost, including rotary mechanism, mercury bath, lamps, &c., amounted to 1920*l.*; while the cost of a hyper-radiant of equal candle power would be 5695*l.* Should a greater candle power be desired, all that is necessary is to adopt the double apparatus system now used in France, a sample of which is that of L'Ailly, now being installed at Dieppe, the candle-power of which will be 600,000.

This novel system has many advantages from an economic point of view. It permits of small apparatus being used with small lanterns and accessories. It renders the use of smaller burners possible, and consequently reduces the consumption of oil. One standard form of apparatus serves every purpose. New designs need not be prepared for every new light, and therefore new and expensive dioptric elements have not to be calculated, moulded, and ground. Any desired alteration in characteristic can readily be made by altering the cam attached to the eclipser. It may further be remarked that, by using such a standard light as, say, a third order for first, second, and third-class lights, sailors would not be perplexed by the endless and uncertain variations of the power of lights as given in the Admiralty List. All lights would have the same intensity of beam, whatever the number of flashes. All would have an equal luminous range in clear weather, and penetrating power in fog, and all an equal geographical range so far as power of light is concerned.

The advantages to be derived from this system can be summed up in a few words: (1) Greater characteristic distinctiveness; (2) greater characteristic distinctiveness with no loss of power; (3) reduction in first cost; (4) reduced maintenance; (5) simplification of design and construction; (6) equality of power and efficiency of all light-houses.

To obtain the rapidity of rotation necessary for the lightning lights, it is imperative that some new kind of rotatory carriage should be found. The mercury float mechanical movement devised by Mr. Bourdelles consists in bearing the optic on a bath of mercury, the pressure of which counterbalances the superposed apparatus. A spindle, borne on a pivot, maintains the apparatus in a central position, or, instead of the spindle, horizontal rollers may be employed. The result is great uniformity of speed in combination with a constant of resistance, and this, too, without the introduction of numerous working parts.

#### SUMMERS' DEVICE FOR INSTANTANEOUSLY CHANGING SLIDES.

Fig. 1 is an elevation of the slide device.

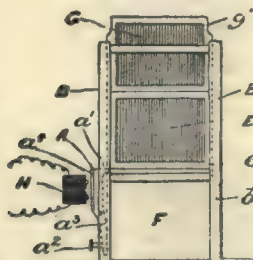
Fig. 2 is an elevation of a modification in which the slides are changed by a rotating device.

Figs. 3 and 4 are vertical sections through carrier, showing a magazine for slides.

Figs. 5, 6, and 7 are elevations of carrier, showing horizontal guides.

Mr. Summers says: In carrying out my invention, I preferably employ a vertical grooved guide, *B*, of sufficient height to accommodate three or more lantern slides one above another, the guide being so fitted to the lantern that the middle slide, *x*, of the three is in focus with the lens. Before placing a slide in the vertical guide the former is first put into a grooved frame, *c*<sup>1</sup>, each frame being so shaped as to permit it to

FIG. 1.

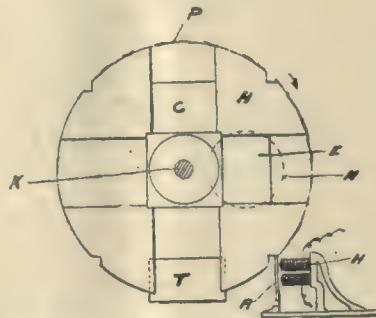


drop, without any manipulation at the lantern, into the required position in the grooved guide, *B*. The vertical guide is fitted with a spring, or other catch, *A*, the tongue, *a*<sup>1</sup>, of which normally projects inward, and in such a manner that it prevents any slide passing the middle or focus position until the said catch is operated, when, by the withdrawal of the tongue, *a*<sup>1</sup>, the frame carrying the slide last exposed falls by its own weight into the space, *r*, below, which has been previously cleared. Each grooved frame or slide-carrier is made somewhat less in width at the top

end, as shown on the slide, *c*, at *p*<sup>1</sup>, this difference permitting the tongue of the spring catch, *a*<sup>1</sup>, to engage with the lower part of each slide-carrier as it falls into the focus position, and thus to be retained until the catch is operated, when the slide last exposed will instantaneously disappear into the space *r*, and that above it in the guide as quickly take its place. Upon the catch, *A*, being released, the slide, *x*, as it falls, strikes the lever, *a*<sup>2</sup>, thereby bringing the catch, *a*<sup>1</sup>, into position for engaging with the next slide, *c*.

The slides may be fed into the hopper-like guide either by the operator at the lantern one by one, or a magazine may contain the remainder of a series of slides, and the latter be fed in rotation either by hand or by mechanical means, as, for instance, the grooved guide, *B*, may be made of a length sufficient to carry any number of slides resting one on top of another, or I may place a holder containing the remainder of the series of slides as shown by fig. 3, in which the slides would be placed one

FIG. 2.



behind another, as shown at *L*, the spring, *M*, being provided behind to move them forward to mouth of guide, or the bottom of the holder may be inclined at such an angle as will make the slides have a tendency to move towards the mouth of the grooved guide, *B*, or, again, the holder may be fitted with a lever or catch which, when operated, releases or brings forward a slide. This lever or catch may be either operated by hand or by the weight of the slides falling after they have left the holder, or again to overcome the difficulty of slides stopping at the mouth of grooved guide, and not dropping down through the pressure of slides behind, I may employ an endless band, *v*, at each end, with projections, *d*<sup>1</sup>, working in the groove of the guide and parallel to it. The projections, *d*<sup>1</sup>, would be placed at such distances as would allow the carriers with slides, or the slides, to rest between them; fig. 4 shows one of the grooves fitted with an endless band running over pulleys, *x*, and *x*<sup>1</sup>. A slide rests on the projection, *d*<sup>1</sup>, and another on the projection above; by means of the spring, *M*, a slide is pressed forward to mouth of the grooved guide, *B*, and rests on the projection, *d*<sup>1</sup>, below it. When the catch, *A*, is withdrawn the bottom slides cannot fall without carrying the top slide with them. Thus it has the weight of several slides instead of one to overcome the

FIG. 3.

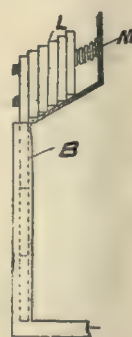
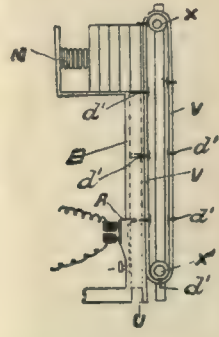


FIG. 4.



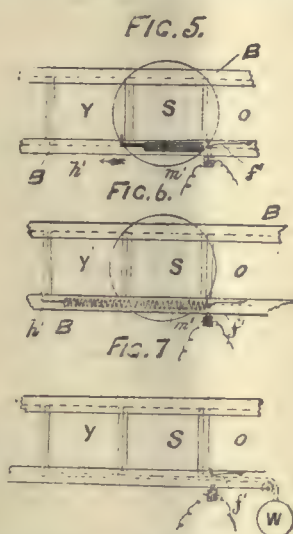
resistance at mouth of grooved guide, while each bottom slide falls out at *v* into a receptacle placed beneath to receive it; or an aperture, *b*<sup>1</sup>, may be provided in the vertical slide-carrier, from which the slide may be removed by hand or mechanically by an endless band as shown by dotted lines, *v*, in fig. 1. The catch, *A*, may be manipulated by the operator at the lantern by the button, *a*<sup>2</sup>, or it may be actuated at a distance by means of electrical, pneumatic, or other suitable mechanical devices applicable to such a purpose as for illustration by means of the electro magnets, *K*, the soft iron, *a*<sup>4</sup>, on the catch, *A*, is attracted by a current passing through the magnets, and the catch is withdrawn.

Or I may employ a horizontal grooved guide, and remove slides by suitable mechanical means, such as an endless band, the same tongue or catch being used as described above to control the actual changing.



By a horizontal guide I mean a similar one to the vertical guide above described, but constructed to change slides across the lantern front in a horizontal direction, as this form would be more readily adapted to the view projecting lanterns at present in use. In my vertical pattern the slides require no power to move them in the guide, as they fall by means of their own weight; but, when the guide is placed in a horizontal position, gravity no longer acts in the direction in which it is required to move slides; I have therefore to apply power to give them the required tendency to move, using a similar means of controlling the actual change. This can be done in a variety of ways by mechanical means, several of which I here describe.

Fig. 5 shows elevation of horizontal carrier, with circle showing position of lantern front, *s*, in correct position for showing slide; *x* is where next slide is to be inserted, and *o* space for each slide to be moved to when changed; *h*<sup>1</sup> is a catch which normally rests in its present position, and when withdrawn, by means of pneumatic or other power, in the direction indicated by the arrow, tends to return again to this position as the spring or elastic attached to it, as shown at *m*<sup>1</sup>, pulls it back in the opposite direction to that in which it has been drawn out, as shown by fig. 6. Instead of a spring or elastic substance being used to draw back this catch, a weight may be used to work the carrier. The



catch, *h*<sup>1</sup>, is withdrawn, a slide is inserted at *x*, and the catch made to fasten on to it, or be placed so that it cannot return without bringing the slide with it. The slides, *s* and *x*, will now have the tendency to move across in the direction of *o*, and will do so when the catch, *f*<sup>1</sup>, is withdrawn. The slide, *s*, is then taken out or allowed to drop at *o*, and the next of the series put in at *x*, either by hand or from a magazine such as shown to the vertical guides which would, in this case, be placed in front of the guide.

Or I may employ an endless band or bands with projections as in the vertical guide, and make same have a tendency to move always in the one direction by mechanical means such as a wound-up spring, or again I may use a long band with projections running along the bottom groove, and hanging down over the ends of the guide, and attach a weight, *w*, to the end at that side of the guide towards which I require slides to move as shown at fig. 7, the same kind of catch, *f*<sup>1</sup>, being used as described above to control the actual changing of slides.

The slides in this case may also be fed in and taken out in a similar manner to the other guide before described; or I may employ a circular carrier which is formed in wheel shape as shown by fig. 2, and is free to revolve on the central bearing, *x*, and clips, frames, or holders, are placed round the circumference to hold any number of slides according to the size of such carrier. This carrier, *m*, is placed in lantern front in such a position as will allow of one slide, *s*, being in focus of the lens, *x*, at one time. For changing the slide, the slide, *o*, and holder is simply fed in at *r*, by the operator or magazine at the lantern, and the carrier turned the correct distance to allow the next holder and slide to come into focus, the same movement passing the previous holder and slide, *r*, out of focus. This carrier turns by means of the weight of the slides being in one arc of its circle, or it may be turned by electrical, pneumatic, or other suitable mechanical means, and is also fitted with the spring catch, *x*, which can either be actuated by hand at the lantern, or by means of the electro magnet, *m*<sup>1</sup>, or any of the devices hereinbefore specified, the object of such catch and devices being to enable the actual changing of slides to be controlled from the platform or at any distance from the lantern. It will be obvious that the catch, *a*<sup>2</sup>, may be operated the same from a distance by pneumatic means or by the use of a flexible cord and pulley.

## THE SALVATION ARMY'S USE FOR THE CAMERA, KINEMATOGRAPH, AND LANTERN IN AUSTRALIA.

A SALVATION ARMY official sends the editor of the *Australian Photographic Review* the following interesting account of the work done under this heading:—

During the past twelve months we have made very marked progress in our photographic, kinematographic, and lantern work generally. At the present time we run three kinematographs, three biennial lanterns and nine phonographs, having a couple of operators always touring the different colonies of the Australasian group. During this time, we have taken some seventy or eighty subjects for the kinematograph, the major portion of them being, of course, scenes illustrating our own particular work. Amongst this number are the usual street scenes, water scenes, and also two or three Maori films that were taken by myself whilst in New Zealand some two months ago.

Besides films, we do all our own lantern-slide making, all of these being taken from life models, and nothing but the "Austral" plates used, as we find them in every way undoubtedly superior to anything else we have tried in lantern plates. We have illustrated lectures for both Commandant and Mrs. Booth, with live-model slides numbering several hundred, and these have been given in all the principal buildings of the colonies, including Town Hall, Sydney, exhibition buildings of Melbourne and Adelaide, and the largest provincial halls of the various inland towns of Australasia. By this medium the social funds of the Army have been largely augmented.

Most of our studio work is done in a very commodious and well-lighted studio, situated at the rear of our Australasian headquarters in Bourke-street, Melbourne, but for subjects with a great number of models we have an extra large studio, 40ft. x 22ft., situated within easy distance of Melbourne.

A scenic artist is continually kept with the brush in his hand, painting the various backgrounds needed for the work, some of the sets of slides needing 30 or 40 grounds.

All our kinematograph films are taken with the Lumière outfit purchased from Baker & Rouse some twelve months ago, and I can safely say no other camera, so far as I have seen or heard, can come within "coo-ee" of the Lumière. It is a beauty, and as sure as the sun.

Staff-Captain Perry, the head of the department, is a lanternist of several years' experience, having travelled almost all over the colonies, including New Zealand and Tasmania, and is well known as a photographer and kinematographist of some repute. He is assisted in the studio work by Lieutenant Rumble, the travelling operators being Staff-Captain Williams and Adjutant Dutton.

During the coming twelve months greater strides than ever will be made, and it is safe in saying that this organization is quite up to date in this work, which will compare favourably with any of its kind in the colonies.

## INTERNATIONAL LANTERN-SLIDE COMPETITION.

The following are the rules and conditions drawn up by the Association Belge de Photographie, which is holding an international competition for lantern slides:—

I.—The competition is divided into four classes:—

1st Class.—Artistic Slides: Landscapes, Inland Scenery, and Marine Subjects.

2nd Class.—Artistic Slides: Figure Subjects, Single-figure Studies, Groups.

3rd Class.—Scientific Photographs.

4th Class.—Architectural.

II.—Competitors must state which class they are entering.

Twelve slides must be sent in for each class; the same slides cannot be entered in two classes.

III.—A Special Jury will judge each class.

IV.—Three prizes will be given in each class: 1st prize, a silver-gilt medal; 2nd, a silver medal; 3rd, a bronze medal.

Should the Jury think it necessary, they will also award an honourable mention.

V.—The size of plates must be  $3\frac{1}{4} \times 3\frac{1}{4}$  inches or  $8\frac{1}{2} \times 10$  cm.

VI.—Each slide must bear the competitor's name, title of picture, also class legibly written on the face of mask.

VII.—The slides will be judged by arc lamp.

VIII.—All packets of slides must be sent in, carriage paid, before October 15, 1899, to Association Belge de Photographie, Palais du Midi, Bruxelles.

IX.—Winners of prizes will be required to leave the slides that have been awarded in the hands of the Society until March 15, 1900. The Association will exhibit them at their Annual Meeting of November and also at the meetings of their seven sections in Belgium.

X.—All slides will be returned, carriage paid, to owners.

XI.—All competitors will be informed of the result of the competition in November.

XII.—Every care on the part of the Association will be taken to preserve the slides; nevertheless, they will not be held responsible for loss of damage to slides sent in.

XIII.—An entry form, duly filled up must be enclosed in each packet.



## LUMINOUS PAINTS.

ARTICLES painted with luminous pigments have now been on the market for some time. These objects then shine in the dark, owing that property to a layer of varnish with which they have been covered, and which contains certain finely powdered substances which have the power of absorbing solar light for a certain time and then re-emitting it. Certain of the sulphides of the alkaline earths possess this quality in a marked degree, and are liable to become luminous by exposure to the electric or to the magnesium light as well as to the sun. Several minerals, such as the diamond and apatite, says a contemporary, are phosphorescent, and it was once believed that they attracted light, just as the magnet attracts iron. Some of the phosphorescent minerals were used a very long time ago by the Chinese for the manufacture of luminous paints, for we read in an old Chinese chronicle that about 1000 years B.C. a wondrous picture was shown to the Emperor of China, and appeared white by day, but by night showed a bull in the proper colours. The bull had been painted with luminous paints, and emitted at night the light it absorbed during the day. In 1878, luminous artificial flowers were shown at the Paris International Exhibition. This was the beginning of the practical utilisation of luminous pigments, and shortly afterwards Balmain, an Englishman, took out a patent for the industrial application of these phosphorescent bodies. In time these came to be used for technical articles, and many others in current use. Chemically they are sulphides of the alkaline earths, especially of baryta, lime, and strontia. These compounds are calcined at high temperatures, and used in a very finely powdered state.

The manufacture is conducted as follows:—Wash oyster shells in hot water, calcine them for half an hour, grind fine, and sift. The fine powder is then interstratified with sulphur in a crucible. The cover of the crucible is then firmly luted on, and the contents are then strongly ignited for an hour. The resulting white powder is ground and sifted and mixed with a varnish composed of Kauri or Zanzibar copal, turpentine, and linseed oil. It is important that the varnish should not contain lead or manganese, because these metals would destroy the phosphorescence. It is a singular fact that chemically pure calcium sulphide is not at all luminous. The presence of traces of impurity is indispensable for producing the phosphorescence. The temperature and duration of the calcination have much influence on the luminosity. Salts of strontium require the lowest temperature, and those of barium the highest temperature and the longest continuance of it. Calcium salts stand midway, and require a temperature of 800° to 900° C. for half an hour. The luminosity and the shade are also affected by the nature of the raw material employed. Thus, barium sulphide, prepared from natural barytes, gives an orange phosphorescence, while, with the artificial sulphide, the colour is greenish. Strontium and sulphur, calcined together below 500° C., give a paint with a yellow phosphorescence, but, if the temperature is higher than that, the phosphorescence is violet. These interesting facts are of great importance in luminous paint-making.

The great enemy of all luminous paints is damp, because it causes the formation of non-luminous sulphhydrates. The surfaces to be painted with a luminous paint should be first coated with some varnish, so as to get a smooth surface. Any irregularities injure the effect of the phosphorescence. Luminous water colours should only be used indoors, and on objects which do not get exposed to damp. Porous bodies must have their pores filled up by the application of a solution of gelatine, and be then thoroughly dried before luminous paint is used on them.

One use of luminous paints is for the name plates at street corners (where there is not a public-house). It is true that in towns well provided with night lights this is unnecessary, but all are not so well off, and luminous paints are most useful for painting up names and other information in halls, staircases, passages, &c., which are often or habitually dark. They are also useful in diving operations, and for painting small objects which are often hunted at night, such as match boxes, door handles, candlesticks, watch cases, &c. In this way they indirectly diminish risk of fire.

Luminous paints are made of all colours, but the luminous base is always sulphide of calcium, and it is mixed with other bodies according to the colour wanted. Red is got by adding red sulphide of arsenic and madder, yellow with barium chromate, green with chrome, and blue with ultramarine or cobalt. In all cases the pigment is diluted with artificial barium sulphate.

"I SAW some very interesting rapid exposures of flashlight explosions recently," says the editor of the *Photo-American*. "The camera was eight feet from the pan whereon the pile of powder was burned, and both shutter and flash were set off at the same moment by bulb and tube. One taken in a five-hundredth of a second was particularly interesting, showing what I think was the yet unburned powder. A series of such pictures would be of great value to those who are called upon for much flashwork, as one can learn how to regulate the charge, how much burns and how much is wasted, thus avoiding more smoke than is necessary, waste and mess from unburned powder all over the floor."

A FLASHLIGHT EXPLOSION.—Again we have to caution our readers about the dangers of making and using flashlight powder. A chemist and photographer employed by the Telegraph Publishing Company, New York City, was compounding a flashlight mixture in the studio in West Forty-second-street, on February 9, when the mixture exploded. The

photographer was the only man in the studio at the time, and he was too badly injured to tell what actually occurred. The report of the explosion could, however, be heard a block. The tenants were badly scared, and so were the occupants of adjoining buildings. The explosion was followed by the sound of breaking glass, the concussion having been so great that it wrecked the glass skylight of the studio. The first person to arrive at the studio found the photographer's clothing ablaze, and that he was severely burnt about the head, arms, and body. He was taken to the New York Hospital, where his condition was said to be serious. The blaze in the building was extinguished without difficulty.—*Scientific American*.

A NEW GASLIGHTING SYSTEM.—A representative of *Industries and Iron* had recently the opportunity of inspecting a new invention in coal-gas lighting, which, though at present not fully worked out, he considers presents all the appearance of interesting possibilities. The process is stated to effect a considerable saving of gas in two directions, viz., a diminution in absolute consumption, and a material augmentation in photometric value per cubic foot of gas passing the meter. The data regarding these claims are not yet fully ascertained, so that at present we can pronounce no opinion as to how far they may be justified. It is only fair to mention, however, that the apparatus employed is of a merely experimental character, and has not been submitted as yet to anything in the nature of expert judgment. The method by which the gas is employed as a lighting agent at the same time presents features so interesting as to be worthy of some interim notice, though we trust to be able shortly to present full details, drawings, and other particulars connected with it. The light itself is of a very unusual and attractive appearance, consisting of a cluster of three or more jets burning downwards. The flame is perfectly homogeneous in colour, resembling rather a short rod of carbon heated to high incandescence than the ordinary gas flame. The principle of the invention is the admixture with the gas of a proportion of atmospheric air, and then compressing the admixture to some five inches water pressure, by means of a small portable accumulator or compressor. The gas jets themselves are tipped with, not spongy but solid, platinum, closely perforated so that the jets are self-igniting. Any patent regarding the employment of platinum in this direction is perhaps questionable, as spongy platinum has long been employed for this purpose. As to the beauty of the light itself there is no question. In artistic appearance and the quality of the light emitted it is able to compete with anything now in use, whether oil, coal gas, acetylene, or electricity. Whether or not its claims to superior economy may be borne out, the light itself will certainly claim attention from its intrinsic merits as an illuminant alone.

NEW USES OF GLASS.—Early in October 1898 a paving company of Lyons, France, began laying on the Rue de la République a piece of pavement of ceramo-crystal, ceramic stone, or devitrified glass. During the months of November and December of 1898, and thus far in January 1899, this pavement has been driven over during all hours of the day and night. It has stood as hard usage as any pavement could be subjected to during that time, and is still in an admirable state of preservation. The glass, or ceramic stone, pavement is laid in the form of blocks, eight inches square, each block containing sixteen parts in the form of checkers. These blocks are so closely fitted together that water cannot pass between them, and the whole pavement looks like one large checker-board. Like all thoroughfares in France, the road-bed slopes gently to the walk on each side. Some of the edges of the checkers have been broken off during their three months' service. United States Consul Covert counted some twenty of them that have been slightly chipped on the edges. It is contended that this does not argue against the value of the material as a pavement, and that any kind of stone would have suffered just as much, or more, in the same time. Mr. Covert visited the Ceramo-Crystal Manufacturing Company's works at the suburban village of Demi-Lune, about six miles from Lyons. The factories cover nearly 8000 square yards of ground. Work is now stopped in them while additions are being made to the buildings in the shape of second stories. In the yards are many tons of broken bottles, which the superintendent told me was their "raw material." On the four sides of a large brick smokestack are specimens of ceramo-crystal for buildings and interior decoration, some of the pieces as smooth as highly polished marble, others being rough, like cut stone, and still others having a surface like common brick. The advantages attributed to this ceramo-crystal by the manufacturers are: As a pavement it has a greater resistance than stone; it is a poor conductor of heat, and ice will not form upon it readily; dirt will not accumulate upon it as easily as upon stone, and it will not retain microbes; it is more durable than stone and just as cheap. The Central Architectural Society of France made a report recently on this ceramic stone. This subject is being discussed in the press and is receiving general consideration. An elaborate and exhaustive article in the *Revue des Deux Mondes* for November treated the question under the heading of "A glass house," the writer asserting that a large house constructed entirely of glass would be an attractive feature of the coming World's Exposition in 1900. He said that glass could be used for tubes, pipes, vats, tiles, smokestacks for factories, and for buildings. Double glass walls in a house would admit of the circulation between them of cold or warm air, thus regulating the temperature. The glass house, or the luminous palace, which it has been decided to build on the grounds of the 1900 Exposition, is now being constructed.



## MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."

[May 5, 1899.]

# THE LANTERN RECORD.

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### LANTERN MEMS.

A GIANT projection telescope is the latest invention, and, according to one of the morning papers noted for its "go-aheadness," this wonderful instrument will enable "visitors to view the marvels of the moon as revealed in a picture fifty-two feet in diameter; Mars will be shown twelve feet wide." Of course, every one with only a little knowledge of science has heard of the solar microscopes that were in vogue before the introduction of the oxyhydrogen lime-light and the electric light, but the uncertain nature of our atmosphere and the erratic ways of King Sol have put it out of court for several generations past. How many of the readers of the notice alluded to accepted the announcement as a fact is a problematic matter, but certainly the long-headed would take it more with a spoonful than a "grain of salt."

EVEN given a mirror of six and a half feet in diameter, and weighing three and a half tons, also a telescope nearly 200 feet long, and an object-glass weighing 800 pounds (the diameter is not stated), one cannot help being sceptical about the resulting projection being equal in illumination for 6000 persons to witness, notwithstanding they are "comfortably seated in armchairs, refreshed with cooling drinks." A projection of the sun's disc may be possible, and the moon's surface representation probable, but the image of Mars twelve feet in diameter from its reflected light, if accomplished, will want a lot of heating, if any one is anxious to go one better. I could not, however, but feel somewhat as one feels when reading a story about a person who was pronounced incurable by so many physicians, and had such all-gone feelings until he took Mr. Blank's mixture or pills, and so I did, what most sensible people do with such narratives, read the final paragraph. This, I think, speaks for itself. It is so important, it must have a par all to itself.

"WHEN the weather is cloudy, the telescope will project on the screen photographic images of the heavenly bodies." Photographic, mind you, and, if photographic, what about the illuminant? I do not think there is much risk in prophesying that the weather will always be cloudy, for I should like to realise the wonderful brilliancy of "the planets, stars, comets, and nebulae" that can be "turned on one after the other." I only wish I had sufficient inventive genius to have conceived this idea, for I should have known how to realise it when an electric arc lamp was available, if not to conceal up my

sleeve as the conjurers do, at any rate to so place it in the telescope tube that it faithfully performed the work of the sun. What a glorious opportunity for the mechanical slide-painter to show "naturally" all the wonders of the heavens, including the cleverly contrived solar system slide that form part of the commercial six-guinea astronomical set.

THE public like being gulled, if you can only manage it in a way to entertain them, and can give half a reason for doing so, especially if they go away *instructed*. If everybody told the truth, there would be few fortunes made, and, if facts only were palatable, fifty per cent. of the inhabitants of this universe would cease to be pleased with themselves. I have, in my experience, known of people who told "fairy tales" respecting certain operations or apparatus so often that they in the end believed in what they said themselves, and were quite shocked when some one suggested the statements were a slight exaggeration.

GOING from theories to practice, one is pleased to be able to report the satisfactory progress of such a society as the British Astronomical Association, which mainly consists of amateur astronomers, who have the reputation of being workers as well as talkers. The annual *soirée* was recently held at the Zion College, and in the intervals between the address a number of interesting objects and astronomical instruments were on exhibition, while music was discoursed by a good band.

THE addresses were illustrated by some beautiful photographs of the moon taken direct, and the photographic value of records was shown by the illustrations to the address, "On Observations of Jupiter's Satellites," by Captain P. B. Molesworth, R.E., F.R.A.S. The other address was by Mr. A. C. D. Crommelin, F.R.A.S., on the "Photography of Comets," Mr. Walter Goodacre, F.R.A.S., having explained the photographs of "The Moon."

IN my reference to Mr. Lewis Wright's demonstration at the Quekett Club I scarcely did full justice to his excellent projections with the lantern microscope. I find that some of the objects were magnified to 6000 diameters with the lime light used as the illuminant, and I understand that with the electric arc lamp, using fifteen ampères of current, the definition of objects magnified 10,000 times, is all that can be expected, and even with the lime light, is satisfactory if an opera-glass is used by the audience to see the details. An "oil lens" the lecturer has (about one-seventh) holds out quite sharp up to 11,000 diameters. It will be useful for lanternists to know that such excellent results are obtained with the lantern microscope, while the limelight jet in the cases referred to has a nipple of one-sixteenth of an inch only, for Mr. Lewis Wright is of opinion that more is not much use with projection microscopes, as only the central spot is serviceable with powers over 1000, and lower powers do not require more.

G. R. BAKER.



## A FEW ESSENTIALS TO SUCCESS IN LIMELIGHT PROJECTION.

It is now about seventeen years since it may be said that steady progress has been made in limelight projection, for as far back as the year 1883 several gentlemen commenced to study minutely not only the most advantageous methods for utilising the limelight in connexion with lantern projection, but at the same time experimented largely in the endeavour to overcome any liability of accidents with the means employed at this early date.

At the date mentioned, although in America gas bags had been practically discarded for bottles in which the gas was compressed, in this country they were still being largely employed, but from this date may be said to commence a new era in connexion with limelight projection, because there were not wanting those who saw clearly the immense advantages underlying the use of gases in bottles or cylinders, and that they were certain within a few years to make the use of gas bags a thing of the past.

With the advent of compressed gases in cylinders limelight workers at once saw they had a fresh power placed in their hands in respect of one of its chief essentials, viz., unlimited pressure, and it was not long before one of the earliest difficulties in connexion with the use of compressed gas, viz., the difficulty of delivering the gas to the jet at an equal steady pressure, was satisfactorily overcome. At first this difficulty was so great that many of the most successful limelight workers considered that the light never could be satisfactorily worked, but in the year 1884 the problem was solved by an ingenious form of regulator, which, although large in size and costly to manufacture, gave abundant evidence that, before long, the delivery of compressed gas from highly charged cylinders would be easily accomplished. This early form of governor was soon followed by smaller and less costly patterns of regulators, which, being rapidly placed upon the market, sealed the doom of the good old gas bag, and so at once got rid of very much that detracted from the ease and comfort of limelight working.

In nearly all the early forms of gas-governors or regulators indiarubber in some shape or other was employed, and especially was this the case in what has proved to be perhaps one of the best forms of regulators ever placed upon the market, viz., the original Clarkson instrument, in which the gas is admitted to a small indiarubber bag, which, when distended, entirely cuts off any more gas from the nozzle of the cylinder. This form of regulator is still greatly appreciated by many clever operators, its one drawback being a liability, through rough usage, to leak; but, when properly taken care of, there is no doubt it proved a most valuable essential in limelight projection. In nearly all the earlier forms of regulators provision was made for increase of pressure if desired; but, in contrast to the pressure hitherto employed by the use of gas bags, which, for a good mixing jet, was generally somewhere about twelve or fourteen inches water-gauge pressure, all regulators had a considerable margin to spare; and, when it is borne in mind that a pressure of twelve inches means about seven ounces of weight per square inch, and that the early form of regulator was loaded to one and a half pounds pressure or thereabouts, it is easily seen that the road was soon thrown wide open for the utilisation of more powerful jets than were at first employed.

For ordinary lantern-slide projection in what may be termed a public form, i.e., in large halls where fifteen to twenty-foot discs are required, the mixing jet has always been looked upon as an essential part of a first-class lantern outfit, and, with the improvements connected with the use of compressed gas, experimenters soon gave their attention to the best form of jets to employ, more particularly in relation to the size of aperture that yielded the best results with the increased pressure they now were enabled to bring to their aid. The outcome of these experiments we now see in the numerous new forms of jets which have during the last few years been placed upon the market. Ten years ago a jet that would yield an honest thousand-candle-power light was looked upon as a good thing in the way of radiants, but now there are jets claiming to yield nearly double that power. With regard to the best aperture to employ for ordinary limelight projection, such as where merely lantern slides are concerned, it should be borne in mind that it by no means follows that an aperture such as the seventeenth of an inch, frequently found in jets more particularly designed for a cinematograph, would be the most useful, for, in the former case, there is no actual need for such a powerful radiant; and, further, a most important essential in limelight work such as ordinary lecture purposes requires is a strictly comfortable working lantern, for it must be borne in mind that with more open bores in the nipples of the jet more gas is burned, with, of course, a very much greater increase of heat; therefore the most comfortable aperture to employ in cases where merely ordinary lantern slides are concerned, and where the discs are not required to be beyond, say, fifteen feet, will be about the twenty-fifth of an inch. Any well-made jet in which the mixing chamber is of fair dimensions will, if properly packed and designed, yield easily up to a thousand-candle-power light without pressing beyond the silent working point.

It will be at once admitted that a roaring or whistling jet should never be countenanced for a single moment. In the early days of the mixing jet this trouble was more seen than in the jets of later-day manufacture,

and the cure was soon found to lie in the proper form of packing used in the mixing chamber.

With gas bags there was, of course, a limit to the extent of packing; that could be placed in a jet; but, with the increased pressure from cylinders, larger chambers are made, and these are packed to their last extremity, the aim being to thoroughly mix the gases and to secure a silent light in the jet when under high pressure. The hissing or whistling of a mixing jet is nearly always cured by inserting a number of brass rings, upon which are placed perforated discs of tin; this never fails to yield a good result under an increase of pressure; but, in the newer form of jets, in which the shape of the mixing chamber partakes somewhat of the form of a torpedo, the packing is composed of different material, such as pumice powder and asbestos; and in jets of this class the apertures are larger, more gas is consumed, greater heat generated, and they are intended for cinematographic projection more than for ordinary lantern purposes.

The employment of jets with large apertures calls for special provision in the way of longer-focus condensers, and, if care be not taken in this respect, it will soon become evident by the destruction they will work when used in conjunction with the usual short-focus condenser found in nearly all the stock lanterns of the present day. The writer has over and over again attended limelight exhibitions where this was painfully evident in the cracking of condensers, in one instance no less than three condensers giving way one after another within half an hour. A modern powerful jet, with an aperture of, say, the fifteenth or seventeenth of an inch, should never be employed upon a condenser of less than four-and-a-half-inch focus. No doubt the temptation to use large bores in a jet is very great when an operator is called upon to throw a bright disc from, say, the back of a hall, and long-focus objectives have to be used; and, as every one knows, the longer-focus objective requires the jet being brought closer to the condenser, thereby increasing the risk of fracturing the same. It therefore follows that, if these larger bores are to be employed with any degree of comfort, it is essential that the optical arrangements of the lantern should be such as permit of their being used not only in comfort but in safety.

During recent years the practice of throwing as large a disc as possible from a medium or short distance was, no doubt, fostered by the short-focus objectives supplied with most lanterns; but clever operators, who knew the objectionable features connected with working in the middle of an audience, never countenanced this, and prefer invariably to work whenever possible behind the heads of the audience. Of course, this means long-focus condensers and objectives, and not, as many imagine, merely long-focus objectives only. One of the earliest authorities in limelight projection drew attention to the importance of the employment of long-focus condensers in conjunction with long-focus objectives so far back as the year 1884, for in that year Mr. G. R. Baker, in *THE BRITISH JOURNAL OF PHOTOGRAPHY*, by means of a clever diagram, showed how important it was that the entire optical system of a lantern should be such as I have stated. An ordinary short-focus condenser will not feed, say, a twelve-inch objective properly, and in all cases where such long-focus objectives have to be used longer-focus condensers ought to be provided.

In former years nothing like the same amount of light was yielded by means of gas bags as is obtained now by means of cylinders; but it is well known that many first-class jets are never employed to their best capacity in modern lamps simply by reason of the failure to use them in conjunction with other important essentials. A striking example of this recently came under the writer's observation, where a modern jet capable of yielding a very high candle power was being used in conjunction with a governor that was quite inadequate to yield anything like results. The jet in question was expressly stated to require a pressure of fifteen pounds per square inch; but, in the case referred to, one which yielded only about two and a half pounds was being employed.

In cases where jets of this description are concerned it is, perhaps, advisable to discard the use of regulators entirely, and fall back upon a fine adjustment valve, by which means any amount of pressure may be obtained. When, however, these fine adjustment valves are used on a cylinder, there is a strong liability for the light to go down, by reason of the constantly reducing pressure on the cylinder. In cinematographic work this is not of so much importance, because, prior to every new film, the jets can be run up to their very utmost capacity, and the intensity of light will continue sufficiently for any one or two films being run through; but for lecture purposes, especially where single lanterns are in use, the light is not kept nearly so steady with these taps as when good regulators are employed.

The difficulty of using these fine adjustment valves on a full cylinder is somewhat greater also than is the case when cylinders of large capacity are somewhat well run down, for the merest hairbreadth of movement will probably bring on unequal mixture of gas in the chamber, so that it takes an experienced hand to employ them; there is no doubt, however, that, when a heavily packed jet is required to yield its best, a set of fine adjustment taps are handy things to have at hand.

Where regulators are used the utmost steadiness can be got out of a jet, and there is no doubt that the addition of screw-down valves to an ordinary tap jet is a great advantage over the old form of jet in which only ordinary taps are provided.

The addition of these new screw-down taps gives also an additional



power and facility in regulating the flow of the gas, and permits not only of the nicest possible adjustments, but enables the gases being turned down or entirely cut off by means of the ordinary wing taps without disturbing the fine adjustments derived from the screw-down; and this permits of all adjustments being made prior to the commencement of a lecture, which is an important essential and a great comfort.

A. T. NEWTON.

### TESTING ACETYLENE GENERATORS.

There are four villages in this country, says the *Scientific American*, lighted in part or entirely by acetylene gas, and a number of stores, factories, and hotels have installed plants having a capacity of about two hundred lights each; but, nevertheless, the principal development to-day is with that type of generator that is adapted and intended for the lighting of such places as dwelling-houses, small stores, offices, or shops, in localities where the ordinary city gas is not to be had or is supplied at an excessive price.

Up to the present, the development in generator design and construction has rather tended toward multiplicity, rendered possible by the simplicity with which the gas can be generated, and inventors find that it requires very little ingenuity to devise a satisfactory apparatus for the purpose.

This multiplicity of apparatus is instructive as a study, but when they are actually to be introduced into communities where their faulty action, especially in the hands of careless or ignorant persons, may cause loss of life or property, the idea at once suggests itself, How are we to know whether any generator of the sort offered for sale is safe?

To this question there is but one answer, Test it, have some one else test it, or inspect it at some place where the generator has been in use for a long time. There are other considerations to be reckoned upon than the simple possibility of the apparatus being able to supply gas. Among these may be mentioned the possibility of the gas igniting through the generation of excessive heat in a generator which contains some air, and consequent explosion of the apparatus, although this is liable to occur only in the drip or dip types. Gas may escape into the generator room and be accidentally ignited. The apparatus may be so made that emptying or charging it fills the apparatus with too much air—a fact which soon becomes evident when the careless or ignorant operator brings a flame near it. Deposits of lime, tar, and water in the house pipes caused by lack of filters and condensers, too much heating or violent generation, or an over-production of gas may burst the apparatus or blow out the seals and fill the neighbourhood with an evil-smelling gas. Many other inconveniences may be noted, but these are sufficient to show how important it is to have the apparatus tested or a satisfactory assurance that this has been done by competent persons.

### LIFE-SIZE ENLARGEMENTS.

#### I.

The production of life-size enlargements is frequently looked upon by a large number of professional photographers as a feat requiring special skill and the possession of plant which only a few expert enlargers have at their command, and this belief has, doubtless, led to the practice adopted by a good many professional photographers of intrusting orders of any special dimensions to certain trade firms who cater more especially for this particular class of work. The outcome of this is that many professionals are in reality simply giving away a highly remunerative branch of photography, and one which is at the same time by no means beyond their skill to personally undertake as well as accomplish most satisfactorily.

In speaking of life-size enlargements, I wish it to be distinctly understood that I do not desire any of my readers to imagine that such enlargements must necessarily be of the portraiture class, for there is a very much wider scope in what may be termed commercial photography, into which enlargements enter and form a very important and remunerative branch of a professional's business.

By the term "life size" I include all exceptionally large-size pictures, ranging up to, say, six or eight feet in length, and it is these specially large sizes that confer upon any one taking an interest in this special class of work so much pride and pleasure when they come to look upon the results they have turned out.

As to the difficulty of undertaking work of this description, it need not for a single moment give any concern to a really competent and practical photographer. No doubt in photography, like many other undertakings, there are to be found those workers whose ideas never seem to soar above the "puny," and who rest content with plodding away, day after day and year after year, with the modest half or whole-plate sizes of pictures, and who rarely trouble themselves in their portraiture beyond the time-honoured cabinet. To these the making of a six-foot enlargement does, no doubt, appear a "big job" and one quite beyond their power of undertaking, and so this class of work, which is in reality by no means difficult of accomplishment, drifts into the hands of specialists who know a good thing when it comes their way.

Then, again, there are to be found those workers who are not without the

inclination of undertaking such large work, but are deterred from doing so by reason of the erroneous belief that it necessitates the possession of not only special, but, at the same time, costly apparatus.

I shall endeavour, first, to combat this opinion, and show that in reality the production of large-sized enlargements does not require any costly introduction of special plant or facilities that are not in nearly every instance within the power of any professional photographer to command.

Firstly, I think no one will gainsay the statement that all photographers have at their command an ordinary room in which one window is found, and which, by the exercise of the merest elementary knowledge of carpentering, they can transform into a dark chamber by simply fitting an inner frame, lined with brown paper, in one portion of which is cut out an aperture of sufficient size to illuminate any ordinary negative.

A brief description of the room in which I regularly turn out these large-size pictures may, however, tend to guide those of my readers who would care to undertake this work.

The room that I have utilised as an enlarging chamber is seventeen feet square, and has one window, facing north, six feet six inches by three feet six inches wide. This window has ordinary wooden folding shutters, but these are not cut or tampered with in any way. The chamber is made absolutely dark by inserting an inner lower and an inner upper frame that fit the upper and lower sashes. These are covered with two thicknesses of stout brown paper, and it only takes a second or two of time to insert them against the window sashes when the room has to be converted into a darkened chamber for the purpose of enlarging.

In the lower top left-hand corner of the bottom sash a square opening has been cut out sufficiently large to allow light to pass through the largest negative required for enlargement, and this square aperture has four old worsted stockings tacked along the edges of the opening, the use or purpose of which is to provide a pad that will exclude all light from entering the room from the cut-out aperture of the screen when the rear of the camera that carries the negative to be enlarged is pushed up against the old stockings.

This simple contrivance is most effectual in the keeping out of any strong light, and dispenses with any costly and less effective system of wooden grooves that ever were invented or recommended by namby-pamby workers.

Against the inner surface of the glass pane in the window I place the focussing screen of my 15×12 camera, which is held in position by a couple of wooden pegs held as buttons by means of a round-headed small nail.

The expense of so turning an ordinary room into the very best dark chamber need not exceed one shilling, for the frames can be joined together by any one possessed of the slightest knowledge of carpentry.

To hold the negative in position in front of the diffusing screen (the ground glass), a rough carrier is provided that slips into the grooves of the back of the camera just like the dark slide; this is easily made out of any flat piece of board and need only cost a copper or two, the swinging frame that carries the ground glass being turned over the top of the front extension 15×12 camera, that I employ for holding all-sized negatives. Of course any smaller-size camera could be utilised for work up to the extent of its capabilities, in which case the cut-out aperture in the lower screen must be made to suit such camera.

In placing the 15×12 camera carrying the negative to be enlarged in position in front of the cut-out aperture I use my ordinary studio stand, that is capable of being raised or lowered to the exact height of the stockings, the camera is then pushed firmly against these pads, and all the arrangements, so far as holding the negative *in situ*, are complete at a cost so trifling as to be outside the pale of consideration.

Any one reading some of the treatises that are from time to time written upon enlarging would, no doubt, be frightened at the bare idea of having to provide easels, and runners, and exposing platforms, and a lot of other absolutely useless provisions on this class of work; and no doubt this sort of thing, to a great extent, deters many keen workers from doing their own enlargements. In practical photography it is wonderful how little is absolutely required for turning out the very best class of work. Luxuries, no doubt, do bulk largely in the practice of photography, but, as a general rule, they are of little practical value; the simpler all apparatus is the better, and this I find holds good in the making of large-sized enlargements. It may surprise my readers to be told that in my regular work I dispense entirely with easels, platforms, tramways, and all such accessories, and never find it necessary to employ any other easel than an old kitchen table, whilst for the exposing board I invariably use the trough or large wooden dish that I develop and wash the large pictures in.

When I first took to making these large-sized enlargements, like other workers I had a hazy notion about the need of so many large-sized dishes that I began to sum up the cost, but, setting "a stout heart, to a stye brae," as we say in Scotland, I just faced the difficulty, and a very little close consideration showed me that it was but a trifling matter after all. My first experience of the making of such large-sized pictures was gained many years ago when I saw and took part in the production of large plans and enlargements in one of the leading ship-building yards on the Clyde. Here money was never grudged and the head draftsman and photographer fitted up a costly slate tank with no end of fixings and



water sprays, all very nice, no doubt, but these were luxuries, and in point of fact did not conduce to the turning out of any better results than was possible by the employment of very much less costly means.

It is my good luck to live in close vicinity to a timber or saw mill, and so, when I made up my mind to go into the big in connexion with enlargements, I paid a visit to the foreman of the mill, and, handing him a small specification of the boards necessary for a nine feet wooden dish, I asked him his lowest price for rough undressed boards, cut accurately to sizes given. In ten minutes' time the wood was cut, a few hours after, with the aid of brass nails, it was joined together at home, and the same night, by the aid of the melting of about three pounds of paraffin and a good lot of resin, I was enabled to look with pride and satisfaction upon my effort. In providing the wood it is best not to have it dressed, but on the contrary in the rough condition in which it comes through the mill; in this state the surface is better adapted for holding the wax and resin, and, if a plentiful supply of these ingredients is used along the seams and sides, it will be bottled tight and remain so as long as such is carefully used, and, should it at some time receive rough treatment and show signs of leaking, a hot poker applied to the wax will soon make it right again.

A good sized dish is a great comfort, for it has to do duty not only in development and washing, but likewise for holding the sensitive paper *in situ* during exposure.

The method I adopt is as follows: The table is carefully placed into a position right opposite the lens, and, by seeing that the feet are placed truly against the seams of the boarding of the floor of the room, it is found to be just in the right position parallel with the negative. The large wooden dish is then reared up on its side on the table, care being observed that it is at equal distances at the ends from the side of the table; by this simple means the paper is in true position at both top and bottom and sides, and no distortion is permitted to occur.

The dish is held firmly in this position by nailing guy rods from its outer sides to the floor; when this is done, it is immovable. Of course, before these binding rods are applied, the distance and size of the picture as well as the rough adjustment of focus have been previously made with the dish held temporarily in position. A worker after three or four times having used his apparatus for such large work will become quite accustomed to the distances at which to place his lens from the negative and his sensitive paper from the lens, and little or no delay or trouble will be experienced in placing each of the primary factors in almost their exact position. It practically amounts to a mere matter of having experience with the tools any one is accustomed to use.

The sensitive material for this work is obtained now from the makers in long bands, and in such an exquisite state of perfection that no trouble in this respect need be for a moment dreamt of. It is simply marvellous to what a state of perfection these bromide papers have in recent years been brought.

There is an old saying that a photographer never loses a large plate, and, doubtless, this is to a certain extent attributable to the extra thought and care displayed when large sizes are being manipulated; the same remark holds good in exposing large sheets of bromide paper. Mistakes somehow or other don't occur, at least not with the writer. But then pilot exposures are always previously made, and the same developing solution used. A strip of paper which receives three different periods of time is first exposed, and the development of this never fails to yield or show the best time to give to the full piece.

With dense negatives very long exposures have to be given, running sometimes into hours, but any practical photographer will at once understand that there is no other or true guide to a correct exposure than by running a pilot under entirely similar conditions as regards light and development, and any nonsense that may have been advised as to timing by means of actinometers should be treated with contempt.

In exposing large surfaces of bromide paper for enlarging, the appearance of the image on the surface of the paper cannot be relied upon either as any guide to timing, the only true course is *piloting*, and some consideration must be given to running the test paper over the densest as well as the thinnest portion of the negative.

With some negatives it is strongly advisable to submit the same to a what may be termed printing test, before attempting to utilise them for extreme enlarging. This printing test may take the form of ordinary silver printing, during which any peculiarity should be carefully noted, and, if this is found to require a certain amount of dodging by shielding or such like means, it is a valuable guide to an operator working in a darkened chamber, where he can with ease shield off any desired portion of the picture as was gathered from the test print.

Vignetting is easily performed by placing between the lens and the sensitive material suitable cut-out masks held in the proper position in front of the lens.

By employing a yellow glass in the cap of the lens the paper is easily placed in its proper position to receive the image after the final focussing has been adjusted on a large sheet of white paper.

The best lens to employ must depend upon the size of negative as well as the amount of enlargement that has to be produced. I use both landscape and rapid rectilinear combinations according to circumstances.

The chief factor in success lies in correctly timing the exposure to suit the developer employed, and the best developer in my opinion is ferrous

oxalate, simply by reason of the power a worker has in gaining density by using an old sample of developer.

If, however, any one can depend entirely upon his exposures being right with the changing light that often occurs during the long time necessary, then metol and a dash of hydroquinone is a most tempting formula to use, simply on account of its cleanliness.

In developing, a large supply of solution is absolutely essential, otherwise unequal development will most certainly cause trouble; but, with the solution carefully compounded and a large camel's-hair brush being at hand, a little practice will get rid of all funk, which at this stage is liable to possess an inexperienced hand, and beautifully even results be achieved.

Of course, in large work of this kind, the services of one or more assistants is necessary; but the developing, fixing, washing, and drying is all accomplished with the aid of the dish, without removing or handling the large prints while wet. In drying, the dish is reared on end and all water run off. When this is accomplished, the print is gently lifted and tacked, with a widish margin, to the sides of the dish; this will enable air to play all around it, and in a few hours it will be dry and ready for removal.

It stands to reason that only extremely sharp and suitable negatives are of any use for being used in such large sizes, and, where it is known beforehand that enlargements are likely to be required, it is a good practice to specially provide for such in all negatives to be so used.

The finishing in black and white is an important part of enlarging, to which I hope to refer in a future article.

The mere enlarging, however, is by no means a difficult operation when gone about systematically, and this branch of work is certainly highly remunerative and one which never fails to command satisfaction.

A. SCOTT.

## PHOTO CYCLING.

At the last monthly meeting of the Blairgowrie and District Photographic Association Mr. John B. MacLachlan gave a paper on "Photo-cycling." Mr. MacLachlan is a cyclist of many years' standing, having been one of the founders of the Blairgowrie Bicycle Club in 1884, and, being Vice-President and one of the originators of the Photographic Association, his paper was listened to with interest. After pointing out the suitability of cycling for the photographer and photography for the cyclist, he gave some personal experiences of the delights of a combination of the two pastimes. Speaking practically, he said, "the cycle might be either a roadster or a light roadster according to the weight of the riders; but it is better to err on the side of too much weight than too little, as a rider may wish to carry a half-plate or even a whole-plate for some distance to secure a desired picture, and this luggage, if the cycle is too light, might with disastrous results, put a strain on the frame it was not intended to withstand. Happily the craze for featherweight machines is on the decrease, and the cyclist—be he photographer or not—recognised that a pound or two extra weight and stability was better than a light machine with 'give' in the frame, the loss of power on the latter more than counterbalancing the extra weight on the former. If a first-class new machine was too expensive, get a cycling friend's advice and buy a good second-hand one. Many a time we may have to go out photographing when the roads are not in apple pie order and mud reigns supreme; if we follow the low-toned, leaden-sky cult, we will want to go out frequently when the roads are distinctly bad from a vehicular point of view, and the moral is obvious. Do not have a machine without a gear case and good, broad mud-guards of sufficient length; many of the present-day mud-guards are too short and too narrow for practical purposes."

All things considered, he favoured a quarter-plate-size camera for photo-cycling. This size was not too heavy, it gave a popular size of print, while in many cases it could be used for making lantern slides by contact. Another and very important matter was that, if one was using plates, these could be bought in almost any town, in this size and at almost any speed. The camera that might fulfil all the requirements of the photo-cyclist had not yet been met with, but it would require to be compact so as to be easily carried awheel; it should be self-contained, collapsible and have double extension, suitable for long-focus and W.A. lenses, it should have a rising and falling front, a swing back (swinging from the centre), and also be available for hand or stand with scale focussing and good finders. If, in addition, it was fitted for glass plates (in dark slides for preference) for work near home and also for roller films, for long runs, we would have a camera very near the ideal. There is also another requisite, and with most of us a very important one, the price must be reasonable. He still held the belief that no place was so well suited for carrying the camera as the rider's back. A quarter-plate was not a heavy weight, and, if properly packed in a suitable knapsack, should be little trouble. On the rider's back it sustained as little vibration as possible, and all who have done any photo cycling knew how easy it was to secure an abundant crop of pinholes, mostly caused by dust, &c., coming in contact with the plate. Of course, in theory there should be no dust there, but in practice the fact remains that there always was some dust on the camera, and with the perversity of inanimate things the least persuasion transferred it to the sensitive films. If the knapsack is made with a cane back, that is, strips of cane sewed to the back with about 1½ inches between each strip, there



is a circulation of air between the knapsack and the rider's back that prevents perspiration; or, again, if the straps supporting the knapsack are sewed on a short distance from the top, the knapsack only touches the rider's back at the bottom, the top being tilted out, and this small pressure is less likely to cause the rider to perspire than a flat surface close to the back. The shoulder straps should be broad, and should be web where they cross the shoulder; the straps should be rounded where they come under the armpits.

After the beginner had so far mastered cycle and camera, the essayist's advice was to adopt one special branch of study and devote the greater part of one's attention to it until it was mastered.

#### RENOVATION OF LANTERN SLIDES.

At the close of the lantern season, doubtless, there are many private individuals, as well as large commercial houses engaged in the lantern trade, who will be gathering their stock of slides together, and replacing those which have suffered by reason of the season's wear and tear. This may mean new cover glasses where they have been fractured, and the rebinding of a very large number that have been heavily run upon during the past season.

In these minor details there is but little skill required, and such renovation can generally be accomplished during the spare moments at an assistant's disposal. But there are other cases in which the renovation of lantern slides forms a most important part of the economy in the lantern trade, and by means of which many old slides may be caused to look almost as good as new.

That lantern slides do deteriorate sadly through the wear and tear they undergo is well known, and many a fine old set of collodion and albumen slides, as well as the more modern productions in gelatine, are all liable to suffer from various causes.

Not long ago, a very fine set of Continental slides, made by Ferrier, of Paris, was brought to the writer, that had, by reason of being stored away in a damp cellar, contracted a number of opaque spots something like mildew, and which, when looked at cursorily, seemed to be sadly deteriorated. These damp or mildew spots were very prominent in the skies, and were so bad as to show up strongly when such were projected on the screen. The slides in question were fine specimens of an albumen slide, and as such were justly appreciated, and their owner was somewhat anxious to know if nothing could be done towards removing these spots and renovating the entire slides to something like their original brilliancy.

On examination, the spots were found to be in the extremely fine film of albumen, or, in other words, the marks were not upon the surface; and, although these spots were not noticeable upon those parts of the picture where the silver was reduced, they were objectionable in the clear sky portions.

Now, in nearly all slides made many years ago by means of albumen, the sky portion of the picture is represented by bare glass, and any spot or eyesore on such parts shows up very badly when the picture is magnified upon the screen.

To remove these marks of mildew, the slides were first treated to a warming or heating operation, and their surfaces were gently rubbed with a pad of cotton-wool steeped in turpentine, to which a very little Canada balsam had been added. This wash improved the general appearance of the slides so far as their surfaces were concerned, and got rid of what appeared to be a superficial deposit or slight fog, which evidently had been contracted by damp or the sweating of the slides in the lantern; but rubbing with this solution had no effect in removing the spots of mildew, which were deeply rooted in the film in the sky portion, and the puzzle was how were such to be got rid of.

The slides being made of albumen, it was found that, on such being treated with various solutions in which water was present, a distinct cloudiness was produced in the parts where local reduction was attempted. All such solutions were therefore at once discarded, and it at once became evident that, if these spots in the skies were to be got rid of, the knife or scalpel would require to be used.

The slides in question were largely composed of street scenes and important edifices in Paris and other Continental cities, and in nearly every instance spires and suchlike objects projected over the sky line.

To many the cutting out of an entire sky portion of a lantern slide might seem a difficult and delicate operation, but with a little practice it is very easily performed indeed, and, in cases where the slides are made by means of collodion or albumen, the film being so extremely thin, all that is wanted is a little courage, a good eye and steady hand, and the proper tool to use.

As to the vast improvements that can be effected upon slides by such treatment there can be no doubt, and, with thought and care, old slides can be brightened up and made to look as good as new.

A steady retouching desk is required, and any one going to undertake this operation should first of all provide a little tool that process-block makers employ for cutting out fine lines in their resist. Any one can make such a tool for himself, and such will be found useful for other purposes.

This little tool is simply a medium-sized knitting needle, the end of which is ground down to an extremely fine chisel point, first by rubbing it vigorously on sandstone, and then finishing off on a finer stone employed for sharpening knives. When a nice sharp cutting point has been acquired, let the faulty slide be placed upon the retouching desk, and without any fear or hesitation an operator should proceed to cut away all along the sky outline. This may mean tracing along house-tops, chimney-pots, church steeples, &c.; but, after a minute or two's working, a feeling of pleasure will most certainly be experienced when it is seen what a vast amount of improvement is being effected, and in ten minutes to a quarter of an hour the whole sky portion is easily removed.

Now, it has been stated that in nearly every instance these old albumen slides were composed of clear glass in the skies, and therefore no atmospheric effects are tampered with in such a treatment; but, in these days of severe criticism, a bald white sky is almost certain to be objected to in a lantern slide, although there are those to be found who are bold enough to advocate a clean white sky in a slide in preference to the dirty mud that is trotted out nowadays and made to do duty for sky effects.

However, the first step towards success has been achieved by the removal of the spots and eyesores from the sky, and, if any one has a subject into which it is desired to add a suitable sky, the matter is quite easily performed in the following manner.

Now, there are several ways of adding skies to lantern-slide pictures, but in the case we are dealing with, there being no sensitive material in the slide itself, it stands to reason that a special treatment which is suitable to this case must be resorted to, and either of the following methods can be made to work wonderfully well.

If the operator knows anything about tinting lantern slides by means of oil pigments, the easiest and most expeditious method is to apply just a *souppçon* of Payne's grey or Chinese white to the cut-out portion, and, by means of the forefinger, blend the oil pigment into the semblance of clouds; this is quite effective, and a clever colourist can work up delightful atmospheric effects by such means. On the other hand, recourse may be had to printing a sky on the cover glass. If this method be selected, let a good sky negative be provided—one that is not too heavy for a sunlit subject—and, by placing a lantern plate in contact, expose and develop the same, so as to produce a bold, vigorous impression of clouds over the entire surface of the lantern plate. After being dried, the cloud positive is brought in contact with the slide, and the portions of the positive sky cover glass that are seen to overlap the image of the slide are carefully noted and marked at the edges of the glass. The positive cover glass is then steeped in clean cold water, and, when quite wetted through to the back of the glass, a solution of ferricyanide of potassium and hypo is applied by means of a broad camel's-hair brush. A very few minutes will suffice to remove any deposit of silver from those parts which will overlap the image of the slide, and by means of a weak solution of this reducer the sky portion may be dodged up and improved greatly with a little practice.

By this means excellent skies are produced. When the work is carefully performed, and the slide bound up, no one would credit the amount of improvement that has been effected by this method of renovation.

In many instances, where deterioration is only on the surface, the simple action of applying a coating of varnish will brighten up a slide wonderfully also.

It has been said that, in the case of collodion and albumen slides, the film being so thin, the cutting away of the sky portion is hardly observable, but with gelatine, where the films are thicker, the outline is more apt to be seen. In practice, however, a gelatine slide is quite as easily doctored as a collodion or an albumen one, and I possess dozens of such that are invariably admired when thrown upon the screen, and which no one is able to detect have been subjected to the treatment referred to.

It only wants the proper tool, a steady hand, and a fair amount of courage, and any one possessed of these essentials should not hesitate to cut out a faulty sky and print in another.

T. N. ARMSTRONG.

#### THE DIFFUSION OF LIGHT THROUGH WINDOWS.

Some years ago the Boston Manufacturers' Mutual Fire Insurance Company experimented with various forms of glass in order to arrive at the best means for diffusing light through windows and skylights in mills, factories, &c. Prismatic, corrugated, rough, waved, and ribbed glasses were tried, but it was found that the most uniform diffusion of light was derived from simple ribbed glass in true curves, inverse and obverse, and having twenty-one ribs to the inch.

Since the above tests were made, the subject has been further investigated by Mr. C. L. Norton, and the results published in a circular just issued by the insurance company mentioned above.

Mr. Norton was decidedly doubtful regarding the assertion that more light was admitted into a room when glazed with corrugated glass than when glazed with plain glass. His experiments, however, have clearly shown that at the rear wall of a room twenty-five feet deep the intensity of the light was increased three times by substituting ribbed glass for plain. A similar increase is found on the side walls and ceilings, but on the floor there is a distinct loss near the window. Mr. Norton explains



this effect as follows: "The light entering through a window comes for the most part from the sky, and has therefore a general downward direction, varying with the time and position. Hence the position of the room which receives the most light ordinarily is the floor near the windows; but, if we interpose in this downward beam of light a dispersive glass, the light no longer falls to the floor, but is spread out in a broad, divergent beam, falling with nearly equal intensity on walls, ceiling, and floor. We must bear in mind that we gain nothing in the total amount of light entering the room, but we have simply redistributed the light, taking up from the floor that which fell there and was comparatively useless, and sending it in directions where it is of more service. The result of the examination of the various glasses was to show that a finely ribbed or corrugated glass was better than the others, as it gives the widest and most uniform distribution. There is no apparent gain in corrugating both sides. Ground glass is barred out, because of its actual loss of transparency, caused by slight amounts of moisture or dust. The ribbed glass, three-sixteenths of an inch thick, with twenty-one ribs to the inch, known now as 'factory ribbed glass,' is the best dispersive glass upon the market. When a glass of slightly better appearance is desired, that which is known to the trade as 'maze' glass is the best. It is similar to the fine ribbed glass, except that the ribs are not straight, but are bent into irregular figures."

Photometric measurements were made by taking two rooms, one above the other, alike in exposure, shape, and size, and comparing the intensity of light falling on similar portions of the two when one was glazed with plain glass and the other with the glass under examination. Broadly speaking, it was found that the centre of the room was as bright when lighted by a window of one square foot of ribbed glass as with a window of three square feet of plain glass. This was true in all lights, from a bright sunshine to a heavy thunderstorm, and with the windows facing in any direction.

The ribbed glass, says Mr. Norton, is especially useful in the factory where the question of the position of machinery, &c., is usually decided by convenience in setting it up, and the possibility of getting the greatest number of operatives into the smallest possible space. If the man near the window needs a shade, he cuts off light from the entire room; but the substitution of ribbed for plain glass does away with the necessity for the shade, and benefits, instead of harming, those remote from the window.

#### GEOLOGY IN RELATION TO ART.

At the closing meeting for the season of the Perthshire Society of Natural Science, Mr. Henry Coates (President) in his address took the above as his subject. After referring to the Art Loan Collection, the Photographic Exhibition, and the Water-colour Collection from South Kensington, exhibited at the new Sandeman Public Library, he said, if they left out of account the figure subjects at these three exhibitions, and considered only the landscapes, some interesting reflections suggested themselves when they compared the work of the brush and the work of the camera with a critical eye to details of scientific accuracy. He was not concerned for the present with the question as to which produces the more pleasing or the more artistic picture, but merely which was the more true to nature. At first sight it might seem obvious that the work of the camera must be the more accurate, being an exact transcript of nature as regarded form at least; but this was not necessarily so. In the first place, the camera was apt to give a wrong impression of proportion, especially of distant objects, because the angle which, say, a mountain at ten miles' distance, subtends in the camera was so very, very small as compared with that of a man at ten yards that the former became altogether dwarfed as compared with the latter. Then, again, the camera, although it did not make actual inaccuracies in form, very often failed to give due emphasis to important structural details in the landscape, either from defects of focus or from insufficient distinction of tone. For instance, in various parts of the Tay Valley there were very well-preserved remnants of the ancient river terraces, ranging up to over one hundred feet above the present level of the river. These terraces to any one who knew where to look for them were very clearly marked, and could be traced at intervals along the sides of the valley for miles, but the moment the geologist attempted to point his camera at them they seemed to shrink almost out of sight. The result was not due to the exaggerated imagination of the geologist, but to the inability of the camera to give a due sense of elevation and to distinguish between the various delicate tints of green and russet which made up the colouring of the hillside. Both of these mechanical errors could, of course, be easily rectified by an intelligent painter who knew enough of geology to correctly interpret the phenomena before him. The position, therefore, which he wished to prove was that the artist had it in his power to interpret nature even more faithfully than the photographer, but that very frequently he failed to do so for lack of a little elementary knowledge of natural science.

If they examined an historical collection of paintings arranged chronologically, they should see that the lack of scientific knowledge to which he had referred applied very much more to the earlier than to the recent schools. Indeed, the progress evinced was, to a large extent,

contemporaneous with the progress of the science of geology itself; and one might go even further, and point out that interest in the study of a landscape as a thing of beauty in itself was a growth of comparatively recent times. Of course, there were very notable exceptions, but as a rule the early painters regarded landscape as merely an unimportant adjunct. This was changed now, but there was still a lingering feeling amongst many artists that attention to minor details of earth structure was something beneath their notice, or, at least, that too much attention to such details would destroy the artistic value of their work.

Now, he was not in any way arguing against the views of the "impressionist" school of recent years, that was to say, he did not imply that features of the distant landscape should be reproduced with telescopic distinctness. By all means let them be veiled by all the atmospheric softening that nature herself loved to draw over landscape, and even let that be exaggerated in harmony with the most myopic visions; but what he did insist on was, that whatever details were portrayed, or even faintly indicated, should be true to nature, and should not give even an impression of something which was utterly impossible. He did not profess to be an art critic, and therefore it would be presumptuous on his part to single out any particular artist for adverse criticism. He might, however, from a purely geological point of view, be allowed to point out some of the errors into which artists frequently fell for lack of a little knowledge of earth lore.

In the latter part of his paper Mr. Coates pointed out the principal errors into which artists without a knowledge of geology were apt to fall, and mentioned notable exceptions, such as the late Sir John Millais, John McWhirter, and the late Sam Bough. If even a Reynolds required to mix his colours "with brains" surely it was not too much to insist that the brains of those who aspired to be landscape painters should be instructed in the principles of landscape geology. Indeed, he would go further, and insist that courses of instruction in geology should be established in connexion with all great schools of art, from the Royal Academy downwards. In all these human anatomy was made an essential element in the instruction, and rightly so; but, if it was necessary to have an acquaintance with the skeleton or framework of the human body, and with the muscles which clothed that framework before they could correctly delineate the outward features of the "human form divine," surely it was necessary to have some knowledge of the rocky framework of our earth and of the superficial deposits which cover that framework before attempting to transcribe the features of the landscape. He believed he was safe in saying that scientific accuracy was more frequently to be met with in the Scottish school of painters than in any other. The reason for that probably was, that modern geology took its rise largely in Scotland, fostered partly by the philosophical and inquiring tendency of the Scottish mind, and partly by the wonderful complexity and interest of Scottish rocks. The poet, if his word-painting were to be true to nature, should know something of the past history of the globe, and how its present features had their origin. Much had been written on the question as to whether a scientific knowledge of nature tended to diminish their appreciation of her beauties. For his own part, he could only say that the more he knew, even in a very imperfect degree, the more he wondered and admired. He would even go a step further, and say that, the more he knew, the more he revered the Author of all. It had always seemed to him that those who affected to despise the study of natural science on the ground that it tended to disillusionise the imagination were just those who had not the inclination or the ability to apply themselves to such study. In conclusion, he would sum up his argument by stating that the artist, whether he be poet or painter, who could produce an artistic transcription of nature must produce one that is free from inaccuracies of detail; and to be able to do that he must be possessed of a certain definite amount of scientific knowledge.

#### THE GREAT TELESCOPE AT THE PARIS EXPOSITION OF 1900.

The great telescope which is to figure at the Exposition of 1900, and which is due to the initiative of M. François Deloncle and the skill of M. P. Gautier, will surpass the most powerful instrument of the kind that has ever been constructed. The greatest telescope that exists at present is that of the Yerkes Observatory, says *La Nature*, the objective of which is 3'28 feet in diameter, and the focal distance about 65 feet. It moves around an axis fixed in the centre, and in a vast cupola 78 feet in diameter.

The telescope of 1900 has an objective 4'1 feet in diameter, and a focal distance of 65 feet, and its weight exceeds 44,000 pounds. It was therefore out of the question to think of placing the instrument under a cupola 209 feet in diameter, as this would have required foundations of exceptional solidity, the manoeuvring would have been difficult, the flexions and distortions of the glasses and tubes would have been considerable, and the net cost would have been extremely high.

M. Gautier decided upon a very advantageous form, and one that, under the circumstances, was necessary—that of the Foucault siderostat (a heliostat regulated to sidereal time).

This instrument consists essentially of a movable plane mirror, actuated by a clockwork that causes it to move in such a way that the



luminous rays thrown upon it by a star are, after their reflection, sent in a fixed and absolutely invariable direction. If the axis of the telescope be placed in such direction, the observer, upon putting his eye to the eyepiece, will see the image constantly during the entire time in which the star remains above the horizon, and will be able to study it at his leisure, and to make drawings and photographs of it.

The siderostat comprises a circular mirror 2 metres ( $6\frac{1}{2}$  feet) in diameter, absolutely plane and giving excellent images, and of a 196 feet telescope placed horizontally in a line running north and south. The telescope forms the images to its focus, where they may be examined by means of an eyepiece, or be received upon a sensitised plate, or be projected upon a screen placed in a hall in which they will be exposed to the view of numerous spectators.

Let us now pass to the details. The mirror consists of a glass cylinder,  $6\frac{1}{2}$  feet in diameter and  $10\frac{1}{2}$  inches in thickness, and weighs 7920 pounds. It is arranged in a 6820 pound tube, and is kept in equilibrium through a system of levers and counterpoises.

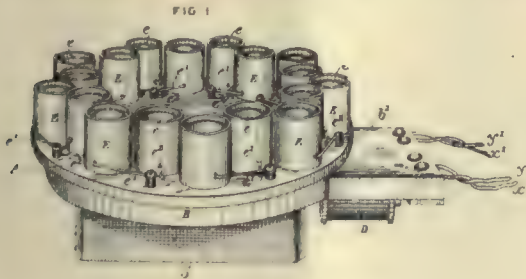
All this part is fixed in a mounting of which the total weight is 33,000 pounds. The base of this mounting floats on mercury contained in a tank, and the thrust of which eases it of  $\frac{1}{10}$  its weight. Hence the clockwork that directs the apparatus has merely to displace a mass of 33,000 pounds, and its motive weight is but 220 pounds.

The siderostat comprises (1) a cast-iron base 34 feet in height, of which the southern part supports the horary axes, parallel with the line of the poles, and its toothed rings; (2) the declination circle; (3) the clockwork movement, connected with the circle and its weight; (4) the cranks which serve respectively for the tangent screw, for the displacements of the horary circle, for the declination circle, and for the winding up of the clockwork. The part situated at the south comprises: (1) the support of the mirror, mounted in the tube and resting upon the breech, with the screw that permits of displacing it; (2) the axis of direction of the mirror, which slides in a tube, fixed upon the diameter of the declination circle; (3) the counterpoise of the mirror; (4) the mercury reservoir; (5) the windlass, designed to raise the receptacle for the silvering mirror; (6) the rollers of the support; and, finally (7), the regulating screws of the siderostat. The objectives are 4.1 feet in diameter, one of which is designed for visual observations, and the other for photographic work. They are mounted together upon the same carriage, the base of which rolls upon the rails by means of wheels, in such a manner that one or the other can be easily adapted to the extremity of the telescope, which is in the vicinity of the siderostat. The tubes that carry the crown and flint-glass lenses are mounted upon the rails. The flint and crown glasses may be separated from each other in order to permit of wiping off any dust that may settle upon them.

#### BOYER'S IMPROVEMENTS IN FLASHLIGHT.

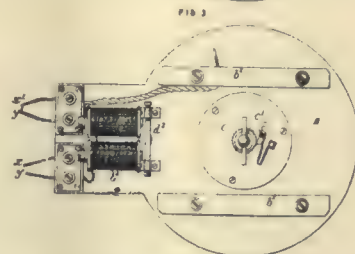
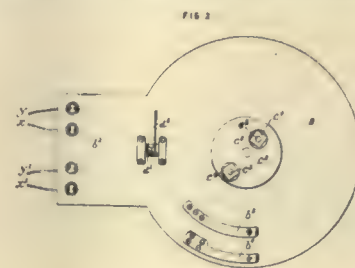
M. BOYER thus describes his invention:—

"I provide an upper plate or disc, A, made of wood, ebony, or the like non-conducting material adapted to be rotated by clockwork on a lower plate or disc, B, made of a like material. On the lower plate, B, which is provided with insulating supports,  $b^1$ , the clockwork mechanism, C, is mounted, which is wound up by a key,  $c^1$ , on the under side of the plate. To the revolving part,  $c^2$ , of the clockwork, C, on the plate, B, vertical screw threaded rods,  $c^3$ , are secured which can fit into corresponding



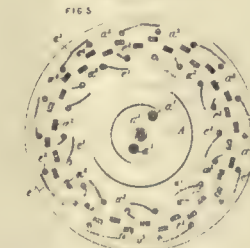
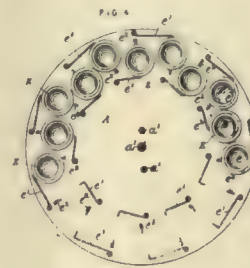
holes,  $a^1$ , formed in the upper plate, A, so that the said upper plate may be passed down over the rods,  $c^3$ , and firmly clamped to the aforesaid revolving part,  $c^2$ , by screw nuts,  $c^4$ , so that the two plates are in the relative positions indicated in fig. 1, and both can then be rotated together, the lower plate, B, itself remaining stationary. The lower plate is formed with a projecting side piece,  $b^2$ , on which are mounted on the under-side coils, D, connected to a source of electricity by conductors,  $x, y$ .  $d^1$  is a pawl or catch forming a part of the armature,  $d^2$ , and  $d^3$  is a spring tending to keep the armature from the coils when there is no current passing through them. On the under side of the plate, A, I provide an inner and outer set or series of abutments or stops,  $a^2$  and  $a^3$  respectively, so that the pawl or catch,  $d^1$ , will come against one of the

series of stops,  $a^2$ , when the armature is attracted by the coils, D, and against one of the other series of stops,  $a^3$ , when repelled from the coils by the spring,  $d^3$ . On the top side of the plate, A, the cups or receivers, E, formed with porcelain or the like lining,  $e$ , containing the magnesium or the like material for obtaining the flash-light, are arranged preferably in concentric circles as shown in the drawings, and held in place by spring catches,  $e^1$ , and clips,  $e^2$ , which may pass through holes formed near the base of the said cups, as shown in fig. 1. Any suitable means may be



employed for igniting the magnesium or the like contained in the cups, but I prefer to employ one of the following arrangements in combination with the upper plate rotated on the lower plate as already described. In the arrangement shown in the drawings I provide spring contacts,  $b^3, b^4$  (fig. 2) on the upper side of the lower plate, B, connected to a source of electricity by conductors,  $x^1, y^1$ , which are caused to complete a circuit by coming into contact in turn with the aforesaid catches and clips,  $e^1, e^2$ , which are passed through to the under side of the plate, A, for this purpose, and each cup or receiver, A, may be provided at its base with coils, so that, on the passage of the electric current, a sparking takes place between these coils in the cup situated over the spring contacts,  $b^3, b^4$ , which ignites the magnesium or the like contained therein; or, in place of the coils, I may use a thin copper wire or other material capable of being rendered incandescent, which is passed through the holes at the bases of the cups so as to come into contact with the spring catches and clips.

"In place of using electrical means for igniting the magnesium or the like in my apparatus, I may employ in the cups or receivers a fulminating cap or explosive or the like, which may be ignited by percussion,



for example, by a spring hammer arranged on the fixed part of the apparatus, operated by a cam or projection on the revolving part, or I may cause the ignition by friction by causing a strip of phosphorus or the



like in contact with the magnesium to be drawn over a rough surface, or the magnesium or the like may be ignited by causing water to drop on any material or compound which can be exploded or ignited by this means.

When the apparatus is to be used, the clockwork is wound up and a current of electricity is passed through the coils so as to withdraw the pawl from the stop of one set, which keeps the plate with the cups from rotating; the upper plate, being released, commences to rotate until a stop on the other set comes against the pawl in its new position. When this movement takes place, the magnesium in the cup, which is now brought over the spring contacts, is ignited, for example, by a current of electricity passing from the conductors,  $x^1$ ,  $y^1$ , to the spring contacts and clips, and the coils or wire at the bottom of the cup which are in electrical contact with the same. Or the ignition may be effected by the mechanical means described or any other suitable means which will cause the ignition of the magnesium in a cup for every partial revolution of the plate. When the electric current is cut off from the magnet, the pawl returns to its original position under the influence of the spring, and the upper plate being released again commences to revolve until the next adjacent stop on the first set or series comes in contact with the pawl. Flash-lights can thus be readily obtained in quick succession by the rotation of the upper plate or disc, which can be operated from any desired distance."

### THE OPTICAL LANTERN.

By ANDREW PRINGLE, F.R.M.S. 149 pp. Price 2s. 6d.  
London: Hampton & Co., 13, Cursitor-street, E.C.

It is eight years since the second edition of Mr. Pringle's admirable book was published, so that the third edition, which has just been issued, may be looked upon as new in that it appeals to a fresh and greatly enlarged circle of readers. The lines upon which it is cast are indicated in one of the prefatory notes, which advises the reader that negative and lantern-slide making are denied reference, and that the author addresses himself less to the popular lecturer than to the photographer and the teacher. Mr. Pringle, it is superfluous to say, is an old and practised hand in lantern work, and in the twenty-one chapters of his book he takes the reader over practically the whole field of "straight through" projection with the certainty and sureness that only long experience can give. Chapters on acetylene, the electric light, and animated photography show that the author well redeems his promise of bringing his book up to date, and in the appendix the very latest forms of lantern apparatus are described.

The *Optical Lantern* is well printed and freely illustrated. The information it gives is so sound and authoritative, that Mr. Pringle's book, which has had the advantage of the revisional assistance of Mr. W. B. Bolton, can be safely recommended as one of the standard books of the photographer's library. In addition to those above mentioned, the chapters on The Condenser, The Projecting Lens, Illuminants, and the Practical Working of the Lantern, are of especial value.

### THE LIGHTING OF THE MAGIC LANTERN.

Among the evening lectures organized in Paris by the societies of popular instruction, those on history and geography were not well attended until we illustrated them by appropriate projections.

The petroleum lantern was first employed, but had to be discarded on account of insufficient lighting and its fuliginous flame. The electric, oxyhydric, and oxyetheric lights are, no doubt, quite effective, but they are expensive, and, besides, cannot be procured everywhere. For these reasons we decided to use the brilliant lighting of acetylene, this gas not being more dangerous to handle in small volume than coal gas, and, at equal delivery, giving a light fifteen times more luminous.

The apparatus, made on our suggestion by Cercked and Deans, is entirely safe and can be easily placed into the magic lantern.

We have stated that this apparatus works well and the light is quite steady during an hour. As to the intensity of the light, a burner of the Manchester type delivering sixty litres per hour gives eighty candles, that is about twice the intensity of a four or five-wick petroleum lamp.

The apparatus generating the acetylene (called *Luciphore*) is constituted by an ensemble of three tubes set one to another; the exterior tube has a diameter of 0<sup>m</sup>.06 and is 0<sup>m</sup>.30 high; the interior tube, or case, can be taken apart in several pieces to facilitate cleaning; it contains a capillary tube, with a groove and an interior wick, fitting the interior part of the case into which one places the carbide. This case is set in the second, which is provided with a cock for the outlet of the gas.

The whole is placed in the interior tube where one pours the water necessary for the decomposition of the carbide.

The loading and cleaning do not require more than two minutes; the quantity of carbide is 300 grammes.

To obtain the acetylene necessary for a lecture of one and a half hours, that is, the ninety litres which can be evolved from the above quantity of carbide of calcium, it suffices to pour a glass of water in the envelope

and instantly one is ready for lighting the lantern, the carbide having, of course, been placed in the interior of the case beforehand.

When the lecture is over, one pours off the water not utilised, and hangs up the apparatus to the exterior of a window for a few minutes, in order not to be incommoded by the disagreeable odour of the gas evolved.

We shall not speak of the economical question; for a lighting of one and a half hours the 300 grammes of carbide suffice. They cost twenty centimes (4 cents) and give an intensity of light nearly treble that from petroleum.

One knows that for the "ideal" lighting of the magic lantern, the source of light should be limited to a mathematical point; it is for this reason that the best lighting is the electric arc. Acetylene gives a brilliant flame of a very small diameter.

By increasing the delivery by adapting a large burner to the apparatus, one can obtain an intensity of more than 200 candles, but, consequently, the duration of the lighting is less. In this case the apparatus should be placed in a pail of cold water to absorb the heat evolved by the rapid formation of the gas, which, however, would have for only inconvenience to produce the evaporation of the water in the apparatus, and, consequently, a crepitation of the flame by the steam carried with the acetylene.

CHARLES GRAYIER in *The Photographic Times*.

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB (PHOTOGRAPHIC SECTION).—On Friday evening last, to a numerous audience, Mr. P. Crowley, a member of the Club, gave a most interesting and detailed description of the Riviera, no less than twenty towns being referred to, among them being Cannes, Grasse, Nice, Monte Carlo and its noted casino, Monaco, Mentone, Cap Martin, Cimiez, and Gorbio. Some of the principal buildings were described: the curious narrow streets, with the arches across to strengthen them in case of earthquake shocks; the manners and customs of the people; the markets; some of the lovely gardens which are to be found in that charming locality; and of the flora, especially the palms, aloes, and prickly pear, were each and all brought vividly before the audience. The verbal description was supplemented by means of 100 photographs, shown as lantern slides, taken and produced by Mr. Crowley himself. At the conclusion, a hearty vote of thanks, proposed by Mr. W. M. Holmes, who occupied the chair, was accorded to Mr. Crowley.

THE MOTHER-OF-PEARL INDUSTRY.—According to Mr. R. Lydekker, F.R.S., in the current number of *Knowledge*, the mother-of-pearl industry occupies a by no means inconsiderable place among the many and diversified enterprises which afford safety-valves for the more energetic of our countrymen. Most of us cultivate the acquaintance of this beautiful commercial product through the medium of studs, buttons, links, and so on—those little, though indispensable, things which on occasion are so liable to rouse feelings that find relief usually by an explosion in the form of bad language. Trifling as is the quantity of mother-of-pearl which finds its way into any single home, taken in the aggregate the full amount and value of the imports are represented by hundreds of tons and thousands of pounds. "About 1853, from which date till 1870 annual returns were issued by the Board of Trade, the mother-of-pearl imports seem to have received a new impetus, the following being the seven maximum years during that period:—

1856	= 43,032 hundredweights, valued at £76,544
1859	= 40,003 " " 67,859
1869	= 37,662 " " 94,015
1854	= 36,644 " " 88,305
1867	= 36,175 " " 70,426
1857	= 34,324 " " 57,819
1868	= 32,002 " " 64,869

From this it appears that, in the last year mentioned, the average price was almost exactly £2 per hundredweight, while in 1869 it was somewhat above, and in 1856 rather below that sum." We are all more or less familiar with the characteristic iridescent play of colours exhibited by mother-of-pearl, and it is interesting to learn that "unlike the colouring of the outer surfaces of shells, which are due to the deposition of pigment in their substance, the iridescence of mother-of-pearl is caused by the mechanical arrangement of the particles of the shell itself, which form a number of extremely minute and delicate ridges and grooves, thus breaking up the light falling upon them into its constituent elements. Pearly lustre is, indeed, precisely analogous to the colours of thin plates or films, and that it is really due solely to mechanical structure is evident by the fact, that impressions taken from mother-of-pearl in gum or fusible metal exhibit the same play of colours."

THERE is a remarkable collection of astronomical photographs at Harvard University. They are kept by Mrs. M. P. Fleming, who is curator. The photographs taken at Cambridge and Arequipa are preserved and arranged in catalogues, as is done with books, but the plates themselves are actually preserved, because no paper copy can repeat all the minute accuracy of the original negative on glass, and prints are not taken from them for scientific use, but only for illustration. If one is destroyed, it cannot be replaced; so it necessitates the greatest possible care in preserving them.



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# THE LANTERN RECORD.

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### LANTERN MEMS.

THE scientific event of the year, the Royal Society's *Soirée*, is invariably productive of some special announcement, or the means of introducing to the public some important invention in connexion with science, and, although the one held on May 3 can scarcely be considered a red-letter one in this respect, there were sufficient high-class exhibits to demonstrate the fact that our professors are not by any means asleep. One missed some of the well-known names in the catalogue of exhibits, but it is only reasonable to expect absentees now and then, for the work entailed in preparing suitable demonstrations for the occasion is considerable and the inventive faculty cannot always be at command; or, if new ideas do occur, they cannot take practical shape just at the time to suit this social function.

THOSE who have not personally exhibited at scientific meetings hardly realise the amount of time consumed by the demonstrator in preparing beforehand, and the energy expended at the time, with the object of interesting the audience, and hence a cool reception is detrimental to future efforts in this way. Men who are busy professionally hesitate to devote the necessary time and undertake the fag of a long evening's explanation, unless some sort of kudos is likely to come out of the attendance. My opinion, from close observation, is that those who do not work for the benefit of science or with a desire to entertain others are apt to be somewhat hypercritical and look for something of such a high standard that only a minority of ordinary workers can hope to reach. A little more graciousness, if not encouragement, would bring on new men who have gone a little out of the beaten track, and their knowledge and experience would, if imparted to a society, be of general service.

REGARDING the exhibits at the *Conversazione*, one of the finest apparatus I have ever seen for the projection of photographic work was a photo-micrographic apparatus designed for the Jenner Institute of Preventive Medicine by Mr. J. E. Barnard, F.R.M.S., and Mr. T. A. B. Carver, B.Sc. It was beautifully made, and so well constructed that perfect rigidity was secured; the stand being constructed on a stiff girder, vibration was apparently entirely neutralised. The source of light was the electric arc, and very clever arrangements were provided for perfect centering and focussing. Scales were arranged on the bed of the instrument, so that, a suc-

cessful result once obtained and the details registered, similar results could be obtained at any future time, as the extension of bellows, position of dark slide, lens, &c., could be exactly located. The illumination of opaque objects was also cleverly provided for.

\* \* \* \* \*

THE Nernst electric light incandescent lamp, which was originally shown at the Society of Arts some few months ago, and stated by Mr. James Swinburne as likely to revolutionise electric lighting, has been considerably improved since, and now, instead of requiring a light to warm the rod of rare earth before the electric current would pass through it and make it incandescent, it is warmed by the heat radiated from a coil of fine platina wire, in which the rod, or electrolytic, conductor is enclosed. As soon as the current is switched on, the wire begins to glow, and, when the rod is warm enough to act as a conductor, the current is cut off automatically from the coil, and the rod becomes incandescent and emits a beautiful light. The size of the lamp, as now constructed, is about the same as that of a sixteen-candle-power incandescent electric lamp of Edison-Swan pattern. These rods of rare earth are comparatively strong, and after a fairly long life can easily be replaced. Moreover a vacuum is not required as in the case of the carbon filament.

\* \* \* \* \*

A MAGNIFICENT piece of work was shown in the Michelson Échelon Grating Spectroscope, which gave splendid dispersion. The accuracy of the plates—fifteen in number—forming the steps was such that they held together (between two clamps) by surface contact only, and the edges of each plate "en échelon" formed the medium for dispersion. The greatest error permissible between each was  $\frac{1}{100000}$  inch, each step being 1 millimetre wider than the previous. The resolving power equals 118,000.

\* \* \* \* \*

SOME fine natural colour photographs of zoological and botanical subjects were shown, mostly from life, taken and prepared by the exhibitor, Mr. W. Saville-Kent, F.L.S. They were three-colour work, each transparency being tinted with the colour complementary to that of the respective negative and the films superimposed in correct register. The brilliant tints and faithful reproduction of colours should make these slides valuable as records of biological subjects. Mr. Kearton had exhibited on the screen some of his interesting and beautiful photographs of wild birds in their native haunts, also of descents of precipices to photograph eagles' nests.

\* \* \* \* \*

THIS reminds me of another intrepid worker in this field of natural history, Lieut.-Colonel Willoughby Verner, who recently showed me some most interesting photographs of eagles' and vultures' nests taken with a daylight changing film camera; one of a young vulture in its nest, and another with the naturalist actually standing in the nest on the top of a very high tree holding an egg in his hand. The adventures that have befallen this gentleman in his



various sporting expeditions are most exciting, and will, no doubt, in due time form the subject of a book that will be eagerly read by all lovers of adventures and those who desire information of the habits of birds gradually becoming extinct. Without doubt, it is this wonderful spirit of pluck and daring, as so often exemplified in the British officer, that makes the odds in his favour when a trial of strength and skill takes place, or when he has pitted against him excessive numbers in war time, and ensures success. Photography is still likely to remain popular while so much good work can be done by simple apparatus.

I CANNOT close these "Mems." without reference to a capital arrangement for showing the waves produced by different conditions of burning of the electric arc lamp. These oscillographs, as shown by Mr. W. Duddell, gave the potential difference and the current waves, and are therefore particularly useful in investigations with alternate currents. An apparatus was also shown which, by miniature projection on a ground glass screen attached to the instrument, traced the wave forms in the same way as that projected on the ordinary lantern screen, and should be most useful to professors, electric-light engineers, &c. It is essentially a galvanometer that has the extremely short periodic time of one ten-thousandth of a second, and is perfectly dead beat for an arranged sensibility. It was very interesting at Burlington House to see the way in which this was adjusted to agree with the alternations of the current, and which was done by the rhythm of the alternations.

G. R. BAKER.

#### NOTE ON SOME PROPERTIES OF THE RADIATIONS OF URANIUM AND RADIO-ACTIVE SUBSTANCES.\*

SINCE the last note upon the radiations of uranium, which I presented to the Academy in the month of April, 1897, some important investigations have been published concerning this question. I need only recall those of Lord Kelvin, Messrs. Beattie and Smoluchowsky, and Mr. Rutherford, respecting uranium, and M. Schmidt, who has found in thorium properties analogous to those of uranium; and, lastly, the splendid researches of M. and Mde. Curie, which have resulted in the discovery of two new substances, polonium and radium, both considerably more active than uranium. I propose to summarise the conclusions which may be deduced from the study of several hundred photographic negatives made during the past three years, and they show how complex this phenomenon of radiation is.

Amongst the properties to which I drew attention at the beginning of my researches, as characteristic of this hitherto unknown radiation, there were three of fundamental importance, which have been observed by every student since. These are the spontaneity of the radiation, its permanence, and its property of rendering gases conductors of electricity.

The intensity of the radiation of uranium does not appear to suffer any notable change in the course of time. The various compounds which I enclosed in a double box of lead on May 3, 1896, and which have been protected since then from all known radiations, continue to impress an image upon a photographic plate with about the same intensity as at first. There appears to have been a slight diminution of energy during the first months; but, since then, the intensity seems to have remained stationary. The difficulty of experimenting with photographic plates of uniform sensitiveness and developing them under identical conditions make it impossible to speak with more precision.

Amongst the other properties mentioned by me, polarisation, reflection, and refraction have not been confirmed by the various students who have repeated the experiments. Neither have the observations which I have made during the last three years confirmed my first conclusions, and they have shown that the phenomena are more complex.

Thanks to the courtesy of M. and Mde. Curie I have been enabled during the last few months to repeat with polonium and radium experiments identical with those I had made with uranium.

*Polarisation.*—No successful experiments could be made showing that the radiation from these substances could be polarised. An early photographic print, shown at the Academy in March 1896, exhibited difference of absorption with plates of tourmaline, according to their crossed or parallel position. A second print obtained a few weeks later gave similar results, but all subsequent experiments with uranium, as well as radium,

have been negative. This result agrees with those of other observers, and the only conclusion which can be drawn is, that the various tourmalines which have been studied are not dichroic for these rays, although they may be capable of assimilation for luminous rays. I have not, however, been able to detect the cause of my first two prints differing from those subsequently obtained.

*Reflection.*—The experiments by which I tried to determine if the radiation of uranium and the other substances could be reflected led to very interesting results. In my preceding notes I described certain experiments the results of which seemed to harmonise with the hypothesis of normal reflection. For instance, when fragments of the active substance were placed on a slip of glass under a bell-shaped tube and then placed upon a photographic plate, not only did a silhouette of the substance appear upon the plate, but also the contour of the tube and the whole of the enclosed surface, although less markedly than the silhouette of the substance. This experiment, after frequent repetition, was varied two years ago in the following manner: A glass tube forming an inverted U, about two centimetres high, closed with slips of glass, was stood upon a photographic plate; within one side of the tube a piece of metallic uranium was placed; a screen of lead was inserted between both branches of the tube to prevent the radiation of the uranium affecting the opposite branch, which was empty. After several days' exposure an impression was observed corresponding to the form of the interior surface of the second branch of the tube, as though the radiation had been reflected by the upper part of this bent shade. A similar experiment was made by substituting for the bent shade a steel mirror placed horizontally, and a somewhat vigorous impression of the radiation from the mirror was obtained.

But these experiments (and several others, which I will not describe here) do not permit us to conclude that normal reflection occurs. I have repeated one of my first experiments many times with variations. This consists in suspending above a fragment of active material a small concave tin mirror, giving good optical images and adjusted in such a manner that the image of the fragment of material is projected upon the plate. I have not obtained any impressions by these means, but in most cases the surface of the mirror seemed to be the source of a new radiation, giving a stronger image for the margin of the mirror than for the central portion, situate at greater distance from the plate.

This experiment seems to favour the hypothesis of an emission of secondary rays analogous to those which M. Sagnac has discovered in relation to bodies upon which X rays impinge, or the hypothesis of diffuse reflection. M. Schmidt's experiments with thorium have also induced him to admit a phenomenon of diffuse reflection.

I then arranged fresh experiments to examine this irregular reflection or new emission, using as active substance carbonate of radium; but, as this substance is luminous by phosphorescence, it is necessary to envelop the plate with black paper to avoid the very energetic action of the luminous radiations. A small cylinder of paper containing radium was placed a few millimetres above a photographic plate thus protected. Strips of various substances—metals, such as copper, lead, tin, zinc, bismuth, aluminium; paper, glass, paraffin, &c.—were placed at various inclinations upon the plate, from which they were separated by a very thin sheet of mica to prevent the disturbing effect of the metallic exhalations. When the plate was developed, after several hours' exposure, opposite the shadow cast by each substance, very energetic action was found at the front margin, which evidently emanated from the objects. This action did not differ much for the various substances. Metals, whether polished or rough, seemed about equal in their effect, but fluorine was particularly energetic in its action.

Moreover, in all the experiments which I had previously conducted, whenever the radiation fell directly upon the body, such as glass, for instance, the parts affected, when very near the plate, were the seat of a radiation much more intense than the incident radiation. This radiation did not extend very far from the object, say 1 mm. from the points of impact, and when the experiments were made in rarified air, under a pressure of 2 c. of mercury, there was no marked extension. The intensity of effect leads one to believe that this is a secondary radiation; but, as this radiation appears to be rapidly absorbed by air, whilst, in the experiments mentioned above, effects of diffuse reflection were observed with uranium through several centimetres of air, it is possible that we have the presence of different radiations in the two cases, or even two distinct phenomena: an emission of secondary rays and diffuse reflection.

*Refraction.*—The study of refraction also led to contradictory results. I have constantly observed the following in the prints I have obtained by means of uranium during the past three years, and the same is also the case with thorium and radium.

\* Translated from the *Moniteur de la Photographie*.



When the active substance was placed upon a strip of glass, either directly or enclosed in a glass or paper tube, and the strip was placed immediately upon the photographic plate, or with an intervening sheet of black paper or thin plate of aluminium, or when the strip of glass was kept at a short distance from the plate without touching it—in all these cases, upon development of the impression, it was observed that the silhouette of the strip of glass was bordered with a white band resembling the shadow the vertical sides of the strip would cast, and the parts where the shadows crossed were whiter than the rest. Outside this band the photographic impression was sometimes very marked. The band varied in breadth with the thickness of the glass, or the inclination of the radiation, or the distance of separation from the photographic plate, and it was then much more diffuse. All these characteristics bear resemblance to a cast shadow, and can be reproduced by light if a substance luminous by phosphorescence is placed upon the strip of glass. The luminous radiations of sulphide of calcium or carbonate of radium may be taken, and it can be shown that the light is refracted by the sides of the strip, and totally reflected upon the vertical surfaces. It would be natural to suppose that the results obtained through black paper or aluminium are due to analogous phenomena of refraction and reflection. All substances transparent to the radiations of radio-active bodies presented the same phenomena when in strips with vertical sides, as, for instance, mica, sulphur, paraffin, copper, aluminium, and the edge of a sheet of black paper or card.

The explanation just given could not be accepted unless it were verified by experiments to ascertain if the radiation under consideration could be bent by a prism of transparent material. Now, experiment has shown that the radiation passes without appreciable deviation through prisms of glass or aluminium.

The following arrangements enabled me to ascertain this fact:—

Two small rectangular isosceles prisms of crown glass 4 mm. high were fixed by their hypotenuses to a strip of glass so as to form a channel. They were placed upon the photographic plate, resting upon the edges of their dihedral, with their hypotenuse surfaces upwards and horizontal. Above their common angle, and about 10 mm. from the glass plate, a small tube about 1 mm. in diameter filled with carbonate of radium was placed parallel to the angle. Under these conditions it may be easily ascertained that the light emitted by the phosphorescence of the carbonate of radium does not pass between the two prisms and is refracted through their outer surfaces, the angle of which is 35°. If the luminous radiation is cut off by a sheet of black paper or aluminium, the result is quite different and the photographic impression shows that the active radiation passes undeviated, with progressive absorption corresponding to the progressive thickness of material of which the prisms are formed.

We also made the following experiment: An oblique slit was cut through a sheet of lead 3 to 4 mm. thick, in such a manner that the radiation from a very thin tube of radiant matter placed parallel could pass through it. The slit was partly covered on the other side with prisms of various substances, a prism of glass 45°, prisms of aluminium and copper of about 35°. The radiation after traversing the slit and the prisms was received upon a photographic plate, and the image of the straight line did not show any appreciable deviation where the glass and aluminium had been interposed. This experiment is analogous to one made by Mr. Rutherford, which also gave a negative result. These latter experiments appear to be conclusive, and an explanation of the facts I first mentioned remains to be found.

*Absorption.*—In the course of the various experiments which I have mentioned, it will be noticed that the radiations emanating from various radiant substances are not only unequal in their intensity, but also differ in absorbability by the various substances through which they may have to pass. Uranium and radium emit radiations which, approximately, pass through the same substances, but the latter is considerably more active than the former. The radiations of polonium, on the contrary, are distinguished by their remarkable absorption. They are badly transmitted by paper, which readily transmits the radiations of radium. An extremely thin plate of mica reduces them considerably, whilst the same plate has much less effect upon the radiation of radium. The latter traverses plates of quartz and spar, whilst the rays from polonium will not penetrate them. Polonium is much more active than uranium behind a leaf of beaten aluminium. Uranium is distinctly more active than polonium behind a plate of aluminium 2 mm. thick. These examples might be multiplied, and they extend also to thorium.

In this order of phenomena difference of absorption appears at present

to be the only indication by which radiations of different nature may be characterised.

To resume. The radiations of radio-active bodies exhibit characteristics which bear nearer resemblance to X rays than to ordinary light. The presence of effects analogous to secondary rays accentuates this resemblance.

Among the inexplicable facts which are met with in the study of this subject one of the most singular is the spontaneous emission of a radiation without a known cause. If it could be demonstrated that this radiation does not correspond to an exertion of energy, the condition under which uranium exists might be compared with that of a magnet, which has been brought into that condition by previous exercise of energy, thenceforward retaining it indefinitely, and maintaining a vicinal field where transformations of energy may be produced. The condition of uranium might also be compared with that of bodies phosphorescent by heat, which seem to retain indefinitely the luminous energy which they have acquired. But the reduction of photographic substances, and the excitation of the phosphorescence of the platino-cyanides observed by M. and Mde. Curie in the case of polonium and radium are phenomena which imply a loss of energy, of which we cannot see the source excepting in the radio-active substance. As this loss of energy is very slight, it would not be inconsistent with what we know concerning phosphorescence to suppose that these substances have a relatively large reserve of energy which they emit by radiation in the course of years without appreciable loss. At any rate, it has been found impossible by physical means to bring about an appreciable variation in the intensity of emission.

HENRI BECQUEREL.

## A FEW ESSENTIALS TO SUCCESS IN LIMELIGHT PROJECTION.

### II.

ONE of the first essentials in limelight working is the absolute certainty of an operator being able to command a steady and silent light. In every audience there are always those who have a dread of any hissing of jets, and, what is quite as disconcerting, the well-known miniature explosions or bangs. With our modern apparatus these need never occur, and, whenever they are allowed to take place, it is quite certain an operator either does not know his business or else for the time being is acting in a careless manner.

The snapping noise, frequently heard when a novice proceeds to light a mixing jet, is caused by admitting a too sudden flow of oxygen into the already existing quantity of hydrogen that has been communicated to the mixing chamber of the jet, and, to avoid these annoying little explosions, the hydrogen gas must first be turned on to about half the quantity that will be finally required when the jet is working at its best; this is lighted at the nipple and allowed to burn for a few minutes; the oxygen is then, with the slightest possible opening of the taps, admitted *very slowly* at first. If this gas is being properly controlled, there will only be just enough oxygen passing as will cause a lowering of the yellow hydrogen flame, and then, by very carefully and slowly admitting a little more oxygen, a point will be reached at which the gases are burning in their proper proportions, and the moment the quantity of oxygen is permitted to exceed this, that moment the "bang" takes place. It is, therefore, a golden rule to follow, viz., "never to allow the oxygen being in excess of the proper proportion to the amount of hydrogen burning at the jet." If more light is required, the hydrogen must always be increased first before any additional oxygen is turned on, and, when these little rules are given attention to, there will be no "bangs" or "snaps" at the jets.

To overcome "hissing" there is no doubt that the newer form of jets, or, for that matter, an old pattern of jet, to which a modern fine adjustment tap has been fitted, provides great security in its prevention. It is not generally known that these splendid taps are easily added to any pattern of jet, such as have their taps in the old-fashioned form or in the winged shape, and, when the new fine adjustment tap is added to it, the very minutest amount of increase or decrease of pressure is easily communicated to the chamber. Hissing, when it arises from over-pressure, need never occur when the modern type of jets is employed. Roaring or hissing was far more common twenty years ago than now, but it still does turn up sometimes, and whenever it is attributable to over-pressure the cure is easily applied by suddenly turning off the oxygen by the wing tap and then gradually opening it again, and finally adjusting the pressure by the fine screw tap. In the older form of jets, in which these double taps did not exist, of course this was not nearly so easily accomplished. If the noise at the jets is caused by a bad nipple when a fair pressure is turned on, a new nipple should be inserted, and an experienced operator always has a spare one at hand. Sometimes a slight noise may be caused by the nipple clogging a little with a bad quality of coal gas, but this is not of frequent occurrence, and a long and very finely pointed needle will, when applied to the orifice of the nipple, generally remove any defect. The above are the chief elements in



obtaining a silent light. Of course, if a jet is being used of the older form in which no packing is present, for the purpose of thoroughly mixing the gases in the mixing chamber, the are not nearly so easily controlled as those in which a good supply of discs and gauze be present.

The increase of packing and in some of the more modern type of mixing jets their peculiar construction has caused makers of gas-regulators to provide for such increase of pressure as is required by reason of this increase of packing, and the newer forms of governors are now made to yield increased pressure to the jets on this account. In the early kind of gas regulators, indiarubber was, in some form or other, nearly always employed; but, by reason of its liability to give way, attention has more recently been given to a form of governor in which the indiarubber is entirely protected from injury, or, otherwise, entirely discarded in their construction. A regulator of this class was designed a few years ago by Mr. Brier of The Scotch and Irish Oxygen Company, Limited, and has acquired a large share of popularity with limelight operators, an important feature being the metallic bellows, as well as the non-liability for any of the working parts being got at. This regulator will stand a lot of knock-about wear and tear, there being no rubber used in its construction, and it can be loaded to any desired pressure, the regular pressure, however, being two and a half pounds per square inch; these have marked a distinct improvement in the utilisation of compressed gas in cylinders, when it is being used in some of the more modern forms of jets requiring a higher pressure than that usually employed in the older form.

It has long been recognised that one of the first essentials in limelight projection is that an operator be intimately acquainted with every bit of apparatus he is employing, and that no new dissolver, jet, or any other part of a limelight outfit should be relied upon without its being subjected to a thorough test. Dissolvers have many breakdowns to answer for, and it is only those having experience of double and triple lantern work that really know the importance of practically testing a new dissolver; fortunately, however, the faults in their construction are now pretty well understood, but there is a pressing need that no new article should be trusted until it has been tried in conjunction with all the other parts of the apparatus. Since the cinematograph has come into such popularity there has perhaps been less demand for double and triple deckers than formerly, and this to a certain extent has tended to popularise the single lantern in a greater degree. Still, binoculars and dissolving effects are by no means things of the past, and very probably will never lose their hold on the public; and, so long as dissolving is resorted to, so long will the same old story of difficulty with dissolvers be sure to crop up if an operator does not give personal attention to the particular dissolver he is using.

This may mean increasing the passage way of the hydrogen lead of gas, so that it is kept well ahead of the oxygen supply, and it is only by strictly attending to little details of this description that really first-class results can be relied upon. And, if it be of the first importance that an operator knows all the particulars of his apparatus, it is equally important that, when the apparatus is in excellent working condition, it should be carefully preserved. Who is there among operators who does not know from experience the hurry skurry that always ensues at the close of a limelight entertainment? This is just the most critical time of all, for, in the desire to bundle up, very probably to catch the last train, everything, so to speak, is shovelled into its place, and but little regard paid to the delicate instruments that so much depends upon. Regulators are knocked about like footballs, jets are pressed into any nook or cranny that will permit of the box closing that contains them; in fact, in nine cases out of ten, everything is packed in as hurriedly as possible. This sort of thing exists to a much greater extent than many imagine, and is liable for numerous little troubles which follow in their train.

I once knew a careful operator who was driven to his wits' end to overcome a difficulty which for a time was unaccountable. The night before all the apparatus had been working nicely, but something of the sort above described had happened so as to catch the last train. The next night, although the same apparatus was being employed, no gas could be got to flow through his oxygen-regulator. A close inspection of affairs disclosed the fact that some one had been tampering with his apparatus, and, when the regulator was finally taken to pieces and examined, a portion of metal was found imbedded in the ingress tube of the regulator which completely closed the aperture. This may have been an accident, but it looked very like a diabolical attempt to upset the show. However, an experience of this kind shows the need of always overhauling the apparatus prior to setting out for an engagement, and in cases of especial importance of being always provided with at least duplicates in the most important portions of same.

With the introduction of the modern form of jets there has also come a leaning towards the employment of larger limes, and especially is this the case in cinematographic work, the object, no doubt, being to protect the lime pin as much as possible, and with some operators the belief that a better light is secured. For a time operators seemed to be somewhat enamoured with these larger forms of limes, and they even became largely used in single lantern lecture working, but the result of two or three years' experience with them seems to be that they are not, when taking everything into consideration, any improvement over the older form and size of lime, and the writer has quite recently heard some very

decided opinions expressed by the leading operators of the day that they intend to resort to the old size and shape of hard Nottingham limes in the future. That much is due in success to a good sample of limes is only too well known, and it may surprise many readers of THE BRITISH JOURNAL OF PHOTOGRAPHY to learn that several of our best operators now only use a lime in high-pressure work for a minute or two's duration, at the expiry of which a new cylinder is placed upon the pin, the result being that during one entertainment perhaps fifty limes are used. This, of course, applies to really high-class projection, but it just goes to show what ardent lanternism really means. It shows the advantages derived by using double lanterns over those of the single form when certain kinds of entertainments have to be conducted, and this is just the one drawback to single lantern working, for we have now such admirable forms of dissolving carriers that do much to assist the use of single lanterns, the one thing wanting being a better form of apparatus for suddenly changing from one lime to another; the party that first invents this in connexion with a limelight jet will do a good thing indeed. Certainly more difficult feats have been accomplished in connexion with our jets and other parts of a lantern outfit.

Three years ago, to judge from the flattering reports that were written and circulated regarding the employment of saturators, it looked as if these had come to stay, but from the very first there was a doubt as to the advisability of employing them in lantern projections, and even those who were the most strong in advocating the use of saturators soon found, from bitter experience, that there lay a danger that was dreadful to contemplate.

I know one case where an operator used a certain form of saturator successfully for two years, but he had his eyes suddenly opened one night in Ayrshire, when he sent a flame forty feet high above the heads of his audience, and he declares to this day he has never been able to account for the accident—and this by an expert in limelight working. Saturators, however, at least, in their present or recent form would appear to be doomed; but, then, why should any element of greater danger be introduced than is actually necessary? There is now no difficulty of obtaining gas in cylinders at almost any part of the world, and the cost and extra bulk ought certainly not to outweigh that of the great security which the employment of gas confers over ether.

In single lantern working where it is confined to small discs, such as are met with in private houses and large rooms, a blow-through form of jet has always been popular, simply because the gas from the main is brought into requisition and thereby a small saving in the cost of hydrogen is effected. A blow-through jet is not comparable, however, to a well-made mixer, and the best houses are now making a practice of always working off two cylinders, even where an installation of gas is at command.

The extra lengths of rubber tubing required, also the tampering with gas fixtures as well as the extra smell always present when gas is led any distance to a lantern, go far as a set-off against the small extra cost of ten or a dozen feet of hydrogen gas, while the ease and comfort of working with a mixed jet is another important factor that has recently weighed with opticians who cater largely for private exhibitions of this kind.

It has been always recognised that in single lantern work there is no need for the employment of regulators, and no doubt this statement has been placed forward simply by reason of the almost universal employment of blow-through jets in single lantern working, but where mixed jets are used it will be found that a pair of good regulators are almost an essential to success, although fine adjustment valves may, at the same time, take their place. Over and over again I have been asked to explain how, in cases where fine adjustment valves are being used, it almost invariably happens that, after the light has been carefully adjusted and a good start made, it suddenly goes down to a considerable extent. At first the general opinion formed was that this sudden dropping of the light was attributable to want of pressure, but this hardly accounted for the great difference that takes place. In cases where half-empty cylinders are employed such a sudden falling away never happens, and a much steadier light is obtained all through; but, where, say, a full twenty feet cylinder is employed to start with, the light invariably drops suddenly. After thinking over this, I am driven to the conclusion that the sudden dropping of light is caused by the cylinder being more or less distended beyond its normal capacity, and this acts as extra pressure, which suddenly ceases when the walls of the cylinder reach their normal state. At this stage the pressure will not vary so much; it is therefore advisable to employ regulators with full cylinders, by which means a fine steady pressure is maintained.

A. T. NEWTON.

## LIFE-SIZE ENLARGEMENTS.

### II.

In a previous article reference was made to the production of suitable, but uncstly, apparatus for making of large-sized enlargements.

Any one who for the first time undertakes the making of, say, a six-foot enlargement will most likely feel somewhat anxious about the possibility of being able to focus a reasonably sharp image, as the result of such an extreme limit when working on, say, negatives of half or whole-plate sizes; for such a stretch is usually looked upon as far in excess of a fair amount of enlargement for small-sized negatives to stand, and no doubt there are many negatives that are quite useless for such being at-



tempted. On the other hand, any negative that possesses a reasonable amount of sharpness may be made to yield very good results.

In commercial work, however, where a photographer ascertains beforehand that enlargements will most likely be required from the negatives he is producing, of course care will be exercised to produce the greatest amount of detail and sharpness that is possible, and in several branches of photography, such as engineering and architectural work, in which enlargements are so frequently required, this obtaining of the utmost amount of sharpness in the original is of the greatest moment, and it frequently happens, where circumstances permit of such being accomplished, where any important commissions for these large sizes are concerned, that it is wise on the part of photographers to discard any negative that may be on hand that does not possess the necessary qualities for enlargement, and proceed to make one specially for the purpose. A little extra trouble and money spent at this stage will save a heap of anxiety later on. The question is frequently asked, How much may any negative be stretched out in enlarging? To this no reasonable answer can be afforded. The writer possesses one negative, which contains the image of a steamer, taken by a drop shutter, when going at a fair rate of speed, that has yielded nearly one hundred six-foot enlargements, and the image of the steamer is not over three inches in extent. But this is an exceptional case, no doubt. Every negative has a limit, and once an operator places it in the enlarging camera, and projects its image on the screen, he soon sees how far it is advisable to work to.

In focussing, provided plenty of light be allowed to pass through the lens, by using it with its widest aperture and finally stopping down somewhat for exposure, the pilot print will show whether or not a sharp focus has been obtained; if not, another attempt must be made before placing the sensitive paper *in situ*; focussing, however, seldom causes any anxiety when a pilot print is run beforehand.

In placing the sensitive paper in position for exposure, a tin hood is used on the lens, in which is fitted a fairly deep canary glass, and if this is of the right tint a reasonable time may be occupied in fixing up the paper and seeing that the image occupies the right position upon it without causing any deterioration or fog; but it is, of course, wise to accomplish this part of the operation with as little delay as possible. A couple of minutes or so will do no harm with fairly dense images, but, if exceptionally thin negatives are being enlarged, it is prudent to insert a second sheet of yellow glass in the tin hood. Fog, however, seldom gives any trouble in enlarging when reasonable precautions are taken.

After a correct exposure has been timed, by means of running the pilot at three varying periods of time, the final exposure is made, and any shielding or dodging, so as to bring up one portion of the negative and keep back another, is performed by wafting a card at a fair distance in front of the sensitive paper, and, if vignettes are required, the vignetter is placed on an upright support a short distance in front of the lens, and moved backwards and forwards until the shading is seen to be as desired. Of course this has to be performed with the double sheets of canary glass in the hood to commence with, and care exercised until it is seen that the vignetter has been made to occupy the proper position between the lens and sensitive paper.

A delightfully soft blender is provided by utilising wooden cut-outs, or apertures, and these can be slid up and down a stiff rod, or attached even to a head rest, which will enable their being placed in any desired position and kept there during the time required for exposure. The wooden cut-outs may have small pieces of tin tacked on to their sides or edges. These little pieces of tin are easily bent round any upright, such as a stout wire or piece of the head rest, and then by pinching the tin it will grip the support and be held firmly in position.

A very handy little contrivance for holding a vignetter in position, between the lens and sensitive paper, when enlarging, is formed by using the upright rod of a microscope lamp, and sliding the cut-out, to which the tins have been applied, up and down, until it just reaches the right position. Some workers seem to shirk the vignetting of pictures in enlarging, and prefer to produce them in what is known as "solid" form, but the vignetting is quite easily performed if such a simple method of holding the vignetter as stated is resorted to, and in portraiture it is often a distinct improvement.

Before attempting to develop such large-sized pictures, special preparation should be made so as to work in comfort. A beginner at this class of work is very prone to engender more or less funk when developing his first monster, for there is no denying the fact that a certain amount of anxiety will animate any one not accustomed to developing very large pictures, but I have never known it to fail that any one, after having developed one or two large-sized exposures, begins to scorn small sizes in future, and infinitely prefers to do the "big ones." In fact, when care is observed, and everything necessary at hand, there is no real difficulty in the operation.

The main factors to be observed in development are the following: First have plenty of developer ready, and see that quite a plentiful supply of safe light is provided, so as to throw a sufficiency of light over the entire developing dish, and then have at least two good-sized tubs placed in position at the corner of the dish where it has been decided to pour off the washing water.

All being prepared, the nine-foot dish is placed upon a large kitchen table and several bucketfuls of clean cold water are placed in the dish, or

as much as will yield at least nearly a depth of an inch with water. The exposed roll is then taken to one end of the dish, and the operator handing over one end of it to his assistant, at the other side of the dish, while he holds the other at his opposite side, the roll is equally unrolled and the paper submerged in the water *slowly*, care being observed that no air bells get underneath. By *slowly* and deliberately unrolling the paper equally at both sides this will be avoided. When the entire length is submerged (of course sensitive side upwards), plenty of time must be given for the paper to become equally saturated throughout. This is important, for, if care be not observed at this stage, there will be a strong liability of causing marks, by unequal development, during the next stage of the operation. In any case it is a *sine-quâ non* that the entire sheet of paper must lie absolutely flat in the bottom of the dish. When the washing water is all run off after soaking, and prior to the application of the developer, four or five minutes may be necessary before the paper is equally saturated and expanded; then, by gently lifting the dish, the water is made to overflow into the tub that has been provided at one corner, and the whole dish is reared up on end for nearly ten minutes to drain off as much superfluous water as possible so as to ensure equal development.

If metal be employed, the plain solution is first applied copiously, and by rocking the dish and the use of a very wide camel's-hair brush it is made certain that every part of the surface has received the developer. This is then carefully poured back into the large wash basin, into which a small quantity of accelerator has been placed, and, when carefully mixed, the entire wash-basinal is deftly applied to the print, and the dish rocked and the solution guided over the entire surface by means of the brush. If the exposure has been right, the shadows or dark portions will come into view in about half a minute's time, and then the entire picture develop beautifully out, any parts that hang back being coaxed up with the brush, and, if necessary, a little extra soda or potash being applied.

If all goes well, the result is something that an operator may well feel proud of, and he is sure to give vent to his feelings by such expressions as "he's a beauty." When the developer is run off, the print is rapidly sluiced with water, to be followed with the fixing solution, all of which, in plentiful supplies, must be ready at hand, and no carelessness, even at this stage, must be allowed to intervene, for it must be seen that every portion is quite fixed. The washing is then finally performed, and the print drained and hung up on the sides of the dish when reared on end, for, say, twelve hours, till quite dry.

The mounting of these large prints is, of course, done upon cloth. Suitable cotton sheeting can be had from any large drapery establishment, and this is first soaked, and wrung out, in clean cold water, and nailed upon a stretcher until practically drum-tight. The dry enlargement is then placed face downwards, and, by means of a wet mop or sponge, a plentiful supply of water is applied to the back thereof, and, when the print is quite wetted equally throughout, a good supply of stiff and cold freshly made paste is evenly spread over its back, care being taken that the paste is quite free of any lumps by having pressed the same through a bag of coarse muslin. The print is then placed upon the stretcher and rubbed into contact, and set away to dry. When all has gone well it will dry up beautifully smooth and drum-tight.

The working up of these large-sized pictures in black and white requires a fair amount of patience, but it is really wonderful what an improvement can be effected with the exercise of a little determination and thought.

If metal has been used in the development, a little ivory black and Chinese white, mixed so as to yield the colour of the different densities it is desired to work up, will yield any depth, from the darkest shadow to the very verge of the high lights, and the picture should be placed under the light of the window in the same position as it is intended to occupy finally.

Three or four hours' steady work with the brush and the pigments named will work quite a transformation.

Any black spots or eyesores that may have to be removed are got rid of by touching them carefully with a finely pointed brush carrying a little solution of ferricyanide of potassium and hypo, and when they are white and dry they are easily coloured to the tint of their surroundings.

After a little practice, any one that at all cares for this class of work will begin to get quite fond of such, and will find himself imperceptibly leaning towards placing any amount of work on such pictures, and feeling quite sorry when he has no more difficulties to overcome.

Quite a volume might be written on the subject of working up in black and white, but the best advice I know of for a beginner is to begin in the simple manner I have stated, working up the dark portions first with the pigments I have mentioned, and he will find himself overcoming difficulties he may for years have deemed unsurmountable.

A. SCOTT.

#### BLACKIE'S METHOD OF GENERATING OXYGEN.

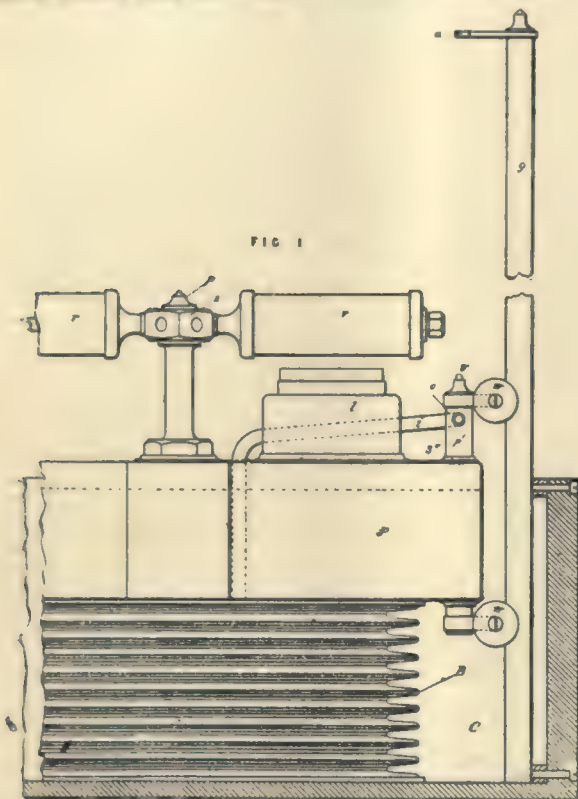
MR. W. BLACKIE employs a case fitted with a gas bag, the top of which forms a platform made hollow to hold water, the weight of which gives the necessary pressure to the oxygen in the bag. Guides are provided to keep the platform level as it rises and falls when the oxygen is admitted.



to or drawn from the bag. Upon this platform is mounted a hollow central pillar, fitted with a swivel head, to which are fixed a number of radial tubes or retorts, capable of revolving, gas-tight, around the central pillar, and at a sufficient height to allow of a heating lamp being placed under them. By this rotary movement the retorts are brought successively over the heating lamp.

The retorts are constructed of a thin cylindrical outer casing, enclosing a small tube arranged axially thereon. The ends of the casing are closed by discs, one of which is fixed on the central tube, and the other is loose, the whole being tightened up by means of a cap screwed on the end of the tube adjacent to the loose disc. Asbestos rings may be employed to make the joints. The usual oxygen mixture of chlorate of potash and manganese is used for generating the gas, but this mixture is pressed into annular cakes, which fit around the internal tubes of the retorts. By unscrewing the single screw cap at the end of the retort, the spent cake can be removed, and the retort charged afresh by the introduction of another cake, after which the retort is sealed by the screw

FIG 1



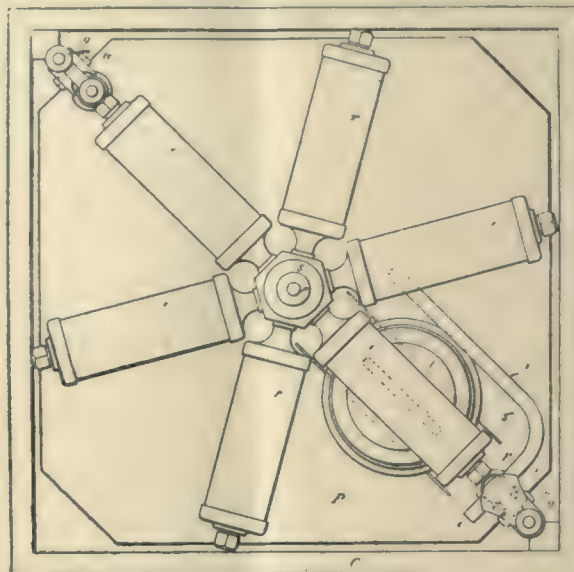
cap. The whole operation of discharging and recharging the retorts can be performed very quickly. The gas generated in the retorts escapes through perforations in the central tube, and passes into the hollow vertical pillar about which the retorts turn, and thence through the hollow platform, where the gas is cooled by contact with the water. Some of the gas passes direct to the jet, and the surplus finds its way into the gas bag. In case more oxygen is formed than the bag will hold, the platform rises until a relief valve therein is brought against an abutment, which opens the valve and allows the excess of gas to escape. When a further supply of gas is required, a fresh retort is brought into position over the heating lamp, and so on, until the contents of all the retorts are spent. A hood guards the flame of the heating lamp, and also fixes the retort under operation in position by dropping between flanges of the plate fixed on the heating lamp, the hood having to be taken off and replaced each time the retorts are moved. The central pillar unscrews at the base, for convenience of packing and to allow of filling the hollow platform with water.

"The construction of the retorts and their rotary movement about the central pillar form the chief features of my invention. In some instances I provide for moving the lamp along the retort to effectually heat the whole of the surface of the latter. The construction of the oxygen-yielding cakes in the form of annular rings is also very important, as it facilitates the decomposition of the cakes."

The inventor adds: "In a modification of my invention, I use one retort only constructed as above described, but of larger pattern, and I arrange it with a capability of sliding horizontally through a holder to bring the various parts of it successively over the heating lamp. I charge this retort with a number of short annular cakes of oxygen-yielding material separated by cupped or other suitable washers forming an

air space to prevent the transmission of heat from one to the other and the consequent firing of the cakes prematurely. As soon as each cake is spent the retort is moved by hand to bring another cake over the lamp.

FIG 2



"In order that my invention may be clearly understood, I have represented an apparatus constructed in accordance therewith in the accompanying drawings, of which

"Fig. 1 is a view from left-hand corner with part removed of the apparatus.

"Fig. 2 is a plan of the same.

"Fig. 3 is a longitudinal section of one of the retorts.

"Fig. 4 is a view of one of the annular cakes of oxygen-yielding substance.

"Fig. 5 is a longitudinal section of a larger-size retort showing one method of forming air spaces between the cakes of oxygen-yielding substance.

"Like letters of reference denote similar parts throughout the figures.

"c is a case for enclosing the apparatus and serving as a packing box therefor; part of the box is removed to show the expansible gas bag, b, for storing the generated gas. r, r, are retorts connected to the central hexagon socket, which revolves gas-tight, forming the swivel head, s, of the central pillar, p, supported on the hollow platform, p, which in its

FIG 3



FIG 4

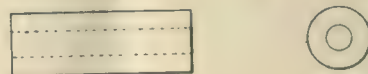


FIG 5



turn is supported by the partly inflated gas bag, b. The weight of this apparatus on the gas bag gives a certain pressure to the contained gas, but for most purposes a higher pressure is required; this can be obtained by charging the hollow platform, p, with water. Attached to the case, c, are upright guides, g, g, for the purpose of guiding by the friction wheels, w, w, the upper part of the apparatus in its ascent and descent when the gas bag is being filled or emptied. l is the heating lamp capable of a movement along the slides, s, over which one of the retorts is placed.



"The gas generated in the retort directly over the heating lamp escapes through a perforation in the swivel head, *s*, into the hollow central pillar, *p*, on to the surface of the water contained in the hollow platform, *r*, thence up the valve pillar, *p*<sup>1</sup>, by the inlet, *i*, to the gas bag and the outlet, *o*, to the limelight jet. In case of there being more gas generated after the gas bag, *b*, is full, it is liberated by the relief valve, *v*, coming in contact with the abutment, *a*, by the rise of the hollow platform, *p*.

"The passage for the gas in the central pillar does not pass down into the water, but ends at its base, and the hollow platform, *r*, is only charged with water up to the dotted line (fig. 1), so allowing a passage for the gas over its surface, and the surface being large condenses any vapour and absorbs any impurities the gas may contain, without any fear of the water being forced into the retort by the back pressure of the gas in the bag, as it is likely to be in the ordinary way of washing gas. Suitable partitions may be fixed in the hollow platform, so making the gas take a sinuous direction and keeping it longer in contact with the water.

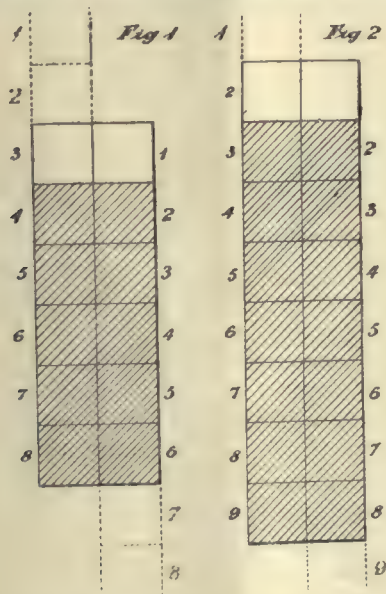
"Only the retort directly over the heating lamp is open to the passage in the central pillar, so allowing any of the other retorts to be opened if necessary for the insertion of a new cake, when the apparatus is at work, without the gas escaping. When the cake in the retort directly over the lamp is spent, the next retort to it is brought to its place over the lamp.

"Fig. 3 is a longitudinal section of one of the retorts showing the method of closing the ends; one end of the retort tube containing the cake is in contact with the asbestos ring in the fixed cap, *c*, the other end being in contact with the asbestos ring in the loose cap, *c*<sup>1</sup>, so that the act of tightening the screw cap, *c*<sup>11</sup>, on the stay tube, *t*, makes a gas-tight joint by pressing its cone into the seating, *s*<sup>1</sup>, at the same time tightening up the joint at each end of retort tube. The holes, *h*, *h*, are for the generated gas to pass into the stay tube, and so into the central pillar, *p*.

"Fig. 5 shows a larger size retort containing a number of cakes; under each cake a heating lamp could successively pass, so as to decompose one cake at a time, the cakes being kept apart by the cupped distance washers, *d*, so forming an air space; the confined air being a bad conductor of heat prevents more than the cake directly over the lamp from being decomposed. In some instances, in lieu of the distance washers, projections on the central tube might be used, or the cakes might be placed in a carrier with projections before being placed in the retort, so keeping them a distance apart."

#### STEREOSCOPIC EFFECTS: RALEIGH'S SYSTEM ON THE SCREEN.

The inventor, Mr. Charles Raleigh, says: "According to one mode of obtaining stereoscopic effects in the representation of moving objects, instead of employing a stereoscopic camera and producing two distinct series of pictures, the two series being respectively taken from points of



view at a greater or less distance apart, I employ a single-lens camera, arranged in any of the modes commonly adopted for taking in rapid succession a series of photographs of a moving object. Having printed or otherwise reproduced the series of pictures in duplicate, I pass the two series side by side rapidly through a stereoscope. Although the two series of pictures are identical, identical representations of the object are

not under observation at the same time; in other words, the one series is arranged slightly in advance of the other, according to the direction of movement of the object photographed. For example, the first picture in the one series may accompany the third picture in the other series; the second may accompany the fourth, and so on, the relation of the corresponding pictures in the respective series being, however, varied according to the degree of relief desired, the lapse of time between the exposures, the speed of the moving object, the direction of motion, and the distance of the object from the camera. Fig. 1 of the accompanying diagrams illustrates this method of arrangement, picture No. 1 in the right-hand series accompanying picture No. 3 in the right-hand series. In fig. 2, picture No. 1 in the right-hand series accompanies picture No. 2 in the left-hand series.

"According to another mode of accomplishing the same object, I employ a single series of pictures, but expose them in a stereoscope arranged in

Fig 3.



Fig 4.



such a manner that the eyes of the observer, looking through the two lenses of the instrument, see the first and the third pictures at the same time, then the second and the fourth, and so on; or the first and the fourth, the second and the fifth, and so on, according to the conditions before referred to as rendering variation in this respect desirable. The former of these two methods is illustrated in fig. 3 of the accompanying diagrams, pictures Nos. 1 and 3 being presented simultaneously. The next pair to be seen would be Nos. 2 and 4.

"The diagram (fig. 4) illustrates a similar method of working, in which pictures Nos. 1 and 2 are seen together, then Nos. 3 and 4, and so on.

"From the foregoing it will be readily understood that, in order to produce from a series of representations of a moving object any given stationary picture, the subject appearing in relief, it is only necessary to select two of the pictures more or less removed from one another as regards their proper positions in the series, and to expose the same to view in a stereoscope."

#### THE PRESENT AND THE FUTURE OF MEANS OF ILLUMINATION.

We are at present entirely dependent upon solid bodies rendered luminous by heat for giving us light, and until very recently the high temperatures necessary to make solid bodies enable us to see were procured solely by chemical action, viz., by the union of carbon and hydrogen with oxygen, the chemical action, in short, which we call combustion. It is only quite of late years that we have utilised the heat developed in a conductor by its resistance to the passage of a current of electricity through it to produce light. Now, however, says Mr. Herbert Robson in *Invention*, all our so-called electric lighting is obtained by that very process. Hence, if we designate the flame of the electric arc, or the glowing spiral of a Swan lamp, an electric light, we should, to be consistent, call the flame of a candle or of a gas jet a chemical light. In the first artificial light the necessary heat was, no doubt, procured by friction, *i.e.*, by the conversion of mechanical force, and, although the process nowadays is somewhat more complex, it is nearly always the case that we begin with mechanical force still. To get an ordinary light we strike a match, and get heat. The heat gives chemical action. That gives more heat, and enables the lighted match to start chemical action between the oxygen of the air and some combustible substance such as coal gas. Even if we do not light a match, we use some burning body which has been lit with one.

The proximate cause, then, of all our present illumination is heat, and the penultimate cause is either chemical action or electricity, in most cases the former, while the ante-penultimate cause in 999 cases out of 1000 is mechanical power. The electric light is very rarely, and never except in a laboratory, produced by the chemically generated electricity of a battery, but is the result of the mechanical power exerted by a steam, gas, or water-driven engine upon a dynamo. This, again, in the ultimate analysis depends upon the power of terrestrial magnetism. The driving power of the dynamo only supplies the mechanical force, and not the resistance which converts the force into electricity.

The great points to be borne in mind are, firstly, that the light is got by the conversion of some form of energy which is not light; and, secondly, that the process of conversion is an indirect one, the energy being first converted into some other form which is not light. The next advance will, no doubt, be to convert some form of energy other than light directly into light without making it into other forms of energy.



different from light as preliminary steps. When this is done it will be a feat far surpassing the discovery of the now completely vulgarised electric light. At present strenuous efforts are being made to obtain light from electricity without first making heat, but there is no known reason why it should not be got direct from energy generated by nature, instead of by artificial methods. There is plenty of heat, electricity, and chemical and mechanical forces round about us which were made without fire bars, bottles, or retorts, or brass balls, wires, or porous pots, and nature interchanges them one for another without any of our scientific paraphernalia of brass and glass. Enormous amounts of every kind of energy are radiated to us from the sun, for example. It may be we shall be able some day to imitate nature, and to get, for instance, "wireless" telegraphy really without wires, which we have not got yet. The next step, however, will probably be to save the intermediate conversion into heat when light is obtained from electricity, and there is at least a chance that the writer of these lines may live to see that done.

#### THE NOTTINGHAM INCANDESCENT LIME-CYLINDER SYNDICATE.

THE prospectus of this Syndicate is in circulation. The capital is 8000*l.*, and the Directors are Messrs. F. Brown, C. W. Locke, J. J. Smith, and J. H. Hutchinson. The following are extracts from the prospectus: The difficulty of obtaining a regular supply of reliable and truly turned lime cylinders of such a quality as will stand the severe test of the improved jets lately introduced is admitted by all opticians, operators, and lecturers. This requirement the Syndicate is now in a position to meet. The Syndicate has up to the present moment secured the businesses of the Incandescent Lime Company, of Nottingham, and Carter & Co., of London, and is negotiating for the purchase of other similar businesses. Orders have been already promised from some of the leading opticians, amounting to an average of 100 gross per week. Subscribers are invited to call and inspect the lime in the rough, and to see it chipped and drilled in their presence. The cylinders so prepared they are at liberty to test on any jet now before the public. The quality of the lime has been subjected to the most severe tests by some of the most well-known members of the trade.

#### THE LANTERN IN THE SCHOOL: HER MAJESTY'S BIRTHDAY CELEBRATION IN THE LONDON BOARD SCHOOLS.

THE Bath-street Board School, City-road, St. Luke's, being the first school in London opened by the London School Board, it was thought by the teachers that, considering the great advances which had been made in education during Her Majesty's reign, it was fitting that her eightieth birthday should be celebrated in such a manner as to impress upon the children the great happiness which had accrued to the nation owing to the long and peaceful reign of Her Majesty. Accordingly, following the instructions of the Board, the children of all three departments, numbering over 1500, were assembled in three relays in the large hall of the boys' department, where a beautiful set of over a hundred lantern slides, specially prepared by the head master, Mr. G. J. Clarke, formerly Honorary Secretary of the North London Photographic Society (now defunct), were exhibited to the children and descanted upon by the teachers. The slides included portraits of Her Majesty at various ages, of the other members of the Royal Family, of scenes in Her Majesty's private life, and many views of public functions, &c. At the end of the entertainment the children sang "God Save the Queen," and the head master addressed them upon the loyalty which was owing by all to so good a sovereign, and the whole school, teachers and children, then joined in three cheers for the Queen, finishing by the head master sending a telegram in the name of the teachers and children of the first Board School opened in London to Windsor Castle, offering their loyal congratulations to Her Majesty upon her having attained her eightieth birthday.

#### ACETYLENE LAMP EXPLOSION.

AN accident, illustrating the need for care in the use of calcium carbide for producing acetylene gas, occurred at Penicuik, near Edinburgh, recently. A young man, home for a holiday, had with him a bicycle acetylene gas lamp, which excited the interest of one of his brothers at home, who determined to make a similar one for household use. Procuring a perfume spray producer, he showed some ingenuity in adapting it for his purpose. When the lamp was lit there was a slight explosion, which was supposed to be due to a small leak near the top of the lamp. This having been securely closed, he determined to have a second trial. He had just retired to his bedroom for the night when the family were aroused by a violent explosion, and on the father going into his son's bedroom he found it in confusion, the lamp being blown to fragments, while his son was bleeding from severe wounds about the right eye. After being attended to by a local doctor, he was taken to the Royal Infirmary, Edinburgh, where the case was regarded as a serious one. An

operation was successfully performed, and he is now progressing favourably. It is probable that the leak which was supposed to cause the first explosion really acted as a safety valve, and made the explosion slight. Probably the young experimenter did not realise that the air in the perfume bottle would take some time to squeeze itself through the orifice of the spray-producer, and by prematurely applying a light the mixture of air and acetylene gas was exploded.

A GERMAN inventor has devised a curious display apparatus, which consists of a mirror having its rear face silvered to such a degree as to render it capable of reflecting objects. A picture is secured in the rear of the mirror, and under ordinary conditions it is indistinguishable through it. An electric light is mounted in the recess at the rear of the mirror, which can be lighted and extinguished at will. When the current is turned on, the picture on the back is brought into view, and, as the light may be flashed intermittently, a curious effect is produced.

THE energy of Röntgen rays has been investigated by the Rev. Alexander Moffat by measuring the luminous energy given out by a fluorescent screen when exposed to the rays. This energy is, of course, very small, but it must be remembered that it only represents four per cent. of the energy impinging upon the screen, and also that the interval between two successive X-ray discharges is about 1000 times the period of time covered by the discharge itself. Allowing for these facts, it appears that, if the Röntgen rays were continuous instead of intermittent, they would exert an effect 500 times greater than sunlight when falling perpendicularly upon a surface.

THE *Militär-Wochenblatt* publishes a description of a portable acetylene field searchlight, invented by Lieut. von Kries, of the German army. It is intended to be used at night in searching for the wounded on the battlefield. The acetylene developer, which a man can easily carry on his back, is constructed to contain rather more than 2 lbs. of calcium carbide. This is sufficient to produce a supply of gas capable of maintaining a light of from 50 to 60 candles for eight hours. A special arrangement of two concave parabolic mirrors increases the power of the light by reflection and concentration to about 100 candles. The light, with the reflector, is placed on the top of an upright rod, which forms a pivot upon which the light can be turned in any required direction. The effective radius is about 100 yards. A metal tube connects the light with the developer. The latter is automatic in its working, and all danger of explosion is fully guarded against. The light can, of course, be used for other purposes than that for which it is especially designed.

ONE has only to go through Dr. Gates' laboratory to see that he is a man of many and interesting ideas. The writer had the pleasure of going through this place recently and of beholding some of the mechanical apparatus there used in connexion with scientific experiments. These investigations take in, with other matters, electricity, music, and X-ray photography. In the electrical field Dr. Gates has, I am informed, made some important discoveries. He has also used solar heat in connexion with storage batteries, obtaining interesting results. At the laboratory location—Chevy Chase, near Washington, D. C.—a large building is being finished, in which will be placed musical instruments, such as pianos and organs, and experiments in sound will be carried on here. It is a well-known fact that some musical notes require more force than others to produce, and that, by properly gauging this force, not only is energy saved, but correct modulation and expression are gotten. This will form part of the investigations in the musical department. Of course, all such work is of interest, but that which Dr. Gates has already accomplished in connexion with micro-photography, with his invention, the mega, or double microscope, should take precedence in the scientific field of his research. With this apparatus, in which one microscope enlarges the image magnified by the other, the result being cast upon the sensitive plate in a camera, objects that are normally invisible are made to appear plainly to the observer, in many instances showing wonderful detail before unknown. The mega microscope has given magnified photographic results of 360,000 diameters, and its possibility, according to its inventor, far exceeds this, running up into millions of diameters. Dr. Gates says, in speaking of his work in this particular, that, with a  $\frac{1}{4}$ -inch objective in the first microscope and a  $\frac{1}{8}$  inch in the second, he has resolved markings and details in microscopic objects which could not be resolved with the best  $\frac{1}{16}$ -inch apochromatic instrument of high aperture, and that when higher objectives than a  $\frac{1}{8}$  and  $\frac{1}{16}$  are used, the eye no longer sees the image, but the sensitive plate comes to the aid and photographs the otherwise invisible image. In describing his photo-micrographic apparatus Dr. Gates says in part in a published article: "I have arranged to exclude from the interiors of the microscopes and camera all dust particles and aqueous vapour globules. The light can act cumulatively, hour after hour and day after day, if necessary, and the photogenic changes made on the sensitive plate will result wholly from the action of the image. From some tests already made I think I am safe in saying that, owing to this device, I shall be able to photograph with less than  $\frac{1}{100,000}$  part of the intensity of light formerly considered necessary."—"J. E. P." in *Anthony's Bulletin*.



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# THE LANTERN RECORD.

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### LANTERN MEMS.

STEREOSCOPIC radiographs were last year produced by Mr. Mackenzie Davidson, M.B., by means of two large photographs taken from two different points, and viewed through a large Wheatstone reflecting stereoscope. This year, at the Royal Society's *Soirée*, he exhibited in operation an apparatus to enable Röntgen-ray shadows to be seen in stereoscopic relief on a fluorescent screen. Persistence of vision is relied on, and two X-ray illuminated tubes are so placed that the hand or other object is seen on the screen, first with one eye and then with the other. A rapidly rotating disc, having two apertures so placed that they alternately cover and uncover each eye is used, and when these alternations are more than ten per second, the impressions are continuous, and the shadow of the object is seen in stereoscopic relief.

CAPITAL results were obtained, using first a skeleton hand and arm for the object, then a living hand, which was in perfect relief, and showed the observer at once whether the palm or back of the hand was towards him as the demonstrator reversed it. For surgical work this system will be invaluable, especially in field hospitals, as the surgeon can exactly locate any object, and mark the exterior surface of the limb from different points of view, and, if necessary, direct in technical language the exact depth necessary for the incision, while another surgeon operates. Many other objects were shown, and especially stereoscopic was a steel hammer, which stood out in the air, and showed the point or large end towards the eye as reversed.

A CLEVER feature of the apparatus was the method by which the two X-ray tubes were controlled. They were each illuminated by a coil having a mechanically driven contact-breaker, each of which acted alternately, as the right or left eye was uncovered by the rotating disc, and, both being driven by the same motor, the illumination of tube and rotation of disc could be exactly timed. As the frequency of these illuminations and obscurations was more than ten per second, persistence of vision resulted, and a continuous illumination of an apparently solid object seen in space was what the observer saw.

SOME fine specimens of the trichromate photographic transparencies were exhibited on the same evening by Mr. Saville-Kent

as lantern slides, stereoscopic, and in half-plate size, which showed that, in careful hands, this process, as suggested by Clerk-Maxwell and worked upon by Ives and others, could produce not only charming, but practical results as records. An interesting diffraction-colour photograph was shown for Mr. R. W. Wood, of the University of Wisconsin, by Professor Boys. For the apparatus a simple arrangement was provided. The edge of the flame of a bat's-wing burner served to illuminate a lens, to the opposite face of which a very faint photographic transparency was fixed. This was of a coloured window, and a little way in front—about one foot—was placed a slit, through which the transparency was to be viewed, and, on the eye being placed at this slit, the colours came out on the transparency. The photograph was taken through three-colour screens and the negatives superposed, before development, by ruled gratings of different pitches, so as to get the correct length wave for the red, green, and blue-violet. The transparency was taken from these negatives by contact printing, and just at the right position the correct colours were seen; but, if the head and slit were moved sideways, the colours changed, for one of the spectra was out of range, and the result given was from two of the screens only.

By the courtesy of Professor Vivian B. Lewes, I am able to answer your correspondent, "Veda," as to the colour of some residues of calcic carbide he sent to the office of THE BRITISH JOURNAL OF PHOTOGRAPHY, contravening, as he thought, the statement made in the Society of Arts lecture. Professor Vivian B. Lewes, who was called abroad after the matter was put before him, and has only just returned, says: "I have examined the sample of residue which you sent me, and it is as good an example as you could find of the results of overheating in a generator, the carbon in it having been nearly all deposited by the decomposition of acetylene through undue heating, and it is not in any way due to the carbide used."

G. R. BAKER.

### ON THE CONSTRUCTION OF CONDENSERS FOR ENLARGING AND PROJECTION APPARATUS.

THE condensers for enlarging and projection apparatus are used to concentrate as much of the light rays as possible on to the object to be projected, whether this be a negative or positive, to evenly illuminate the same, and to transmit the rays which illuminate the object to the objective which projects the enlarged image.

The requirements for the construction of a condenser are that the bundle of rays falling on it should be so refracted by it, that on the one hand the object placed against it should lie within the refracted bundle, and on the other hand that the refracted light cone should have as small a section as possible at that place, so that it passes completely through the objective, and that none should be stopped by the lens mount. Although not strictly so, this requirement is approximately fulfilled when the luminous point and the nodal point of the objective are conjugate foci of the condenser.



In any given case, therefore, the refractive power of the condenser is absolutely fixed.

The simplest and most usual case is that a condenser is constructed of two plano-convex lenses of equal size, with their convex surfaces towards one another. Between them, if their size is to be entirely used, the bundle of rays must be parallel to the axis, so that the luminous point must be at the focus behind the back lens of the condenser, and the focus of the front lens fall in the objective.

The question whether a condenser is better composed of (2) or (3) lenses has been often raised, and this I propose to treat of here.

It must be first noted that these two kinds of condenser can only be compared with one another when they are of equal focus; and it is most probable that the different views which have been so often advanced have arisen from this not being the case. It certainly cannot be denied that a weak two-lens condenser gives a considerably stronger illumination of the image circle when a third lens is added to it next the light than without this third lens, as by this the total focus is shortened, and consequently the source of light is brought nearer, and the angle of light from the luminous point is increased.

The important question now arises whether the same end could not be attained if, instead of adding the third lens, the two lenses, or perhaps only the back one, were made stronger.

The remark has been frequently made that two-lens condensers are quite as good as a triple, since the gain in the light angle, and the consequent increase of light by the addition of the third lens, is again lost by the reflection from the surfaces of this lens and by the absorption in its mass.

In order to test this question one must clearly determine what is this loss.

The loss of light by reflection can be accurately determined by Fresnel's law of reflection. It is dependent on the angle at which the rays strike the surface and on the refractive index of the glass. The incident angles are different the further one gets away from the middle of the condenser and depend upon the curvature of the surfaces. On the latter ground, where no special construction is being considered, one must confine one's attention to those rays which lie in the optical axis, and thus strike all surfaces at no angle. The middle of the image must thus alone be considered.

If the brightness of the incident light = 1, the brightness, with right angle incidence, of the rays which go through the glass surface is—

$$J_1 = 1 - \left( \frac{n-1}{n+1} \right)^2$$

in which  $n$  = the refractive index of the glass.

From this it is obvious that for various kinds of glass or for various amounts of  $n$ —

with $n=1.5$	1.6	1.7	1.8
$J_1=0.960$	0.947	0.933	0.918

This loss factor ensues with each surface, so that we have—

with $n=1.5$	1.6	1.7	1.8
for one lens $J_2=0.92$	0.90	0.87	0.84
„ two lenses $J_3=0.85$	0.80	0.76	0.71
„ three „ $J_4=0.78$	0.72	0.66	0.60

There has been entirely neglected that the light reflected from the second surface within the lens may be in part reflected back by the first surface and thus be used for illuminating, still this is treating of comparatively small quantities of light which have a focus beyond the source of light, and therefore are rather harmful than useful.

Since the refractive index of most of the lenses used for condensers varies between 1.5 and 1.6, the loss of light by reflection, taking the former index  $n=1.5$ , would be—

$$J_4 = 0.825 \\ J_6 = 0.75$$

and the brightness of the triple lenses compared with that of the two lenses would be as 0.75:0.825, that is to say, it would be about ten per cent. less with triple than two lenses.

As regards loss by absorption, it may be assumed to be equal for the two kinds of condensers if the total focus of the two condensers is assumed to be the same; for with this assumption, which is essential for comparison, the lenses of the triple condenser must be much thinner than with the double, so that the total thickness of the two will be about the same.

One advantage of the triple over the two-lens condenser, of equal total focus, must be mentioned, and that is that the optical work is divided over a greater number of surfaces, in consequence of which each surface

has a lesser curvature, whence less spherical aberration is caused; therefore the evenness of illumination, particularly at the margins of the field, will be improved, so that lenses of smaller diameter may be used.

From the foregoing considerations it is obvious that a triple condenser gives a better illumination than two lenses, if it is stronger, that is to say, has a shorter focus; but that, with equal foci of the two constructions, an important advantage of the one over the other can hardly exist.

Dr. HUGO KRÜSS.

## A LANTERN-SLIDE COMPETITION.

THE Association Belge de Photographie has announced an international competition, the slides for which must be sent in by October 15. There are three classes: Pictorial, Scientific, and Architectural. The sizes are restricted to 8×8 and 8½×10 cm. Further particulars may be obtained from the Secretary, 97, Avenue Brugmann, Brussels. The *Photographische Rundschau* complains of the stipulations as to size, and sees no reason why other nations should be precluded from improvement if the English stubbornly decline to adopt a better size. By this, of course, is meant the German size, 9×12 cm. From a discussion at the Vienna Camera Club, we gather that Dr. F. Hermann has advocated 9×12 cm. in the organ of the German and Austrian Alpine Club as a standard size for an exchange of Alpine lantern slides. The President of the Stereoscopic Section of the Vienna Camera Club (Herr Beck) makes a vigorous reply, and pronounces emphatically in favour of the English size. The *Rundschau* bases its chief argument against the English size upon the greater brightness of the image obtained with a larger plate. Against this we would place Herr Beck's remarks: "A not unimportant argument in favour of the size 8.2×8.2 cm. is, that slides of 9×12 cm. require larger lanterns and larger condensers, and it is well known that the latter gives less light with the same illuminant." Herr Beck also mentions the lower price of the plates, and we might add the difference in weight and the saving of carriage where slides are sent from place to place for exhibition.

## COLLODION LANTERN SLIDES FOR AMATEURS.

THE collodion slide is not so difficult to make as the amateur imagines, says Mr. F. Ivins in the *American Journal of Photography*, though not by any means as conveniently made as the ever-ready dry slide by contact printing. A camera is necessary, of course, and I presuppose the amateur knows how to manipulate the wet-collodion process, and I shall merely give formulae which I have found to work admirably.

The silver bath should be forty grains of nitrate of silver to the ounce of distilled water, made acid with pure nitric acid and thoroughly iodised. A bath which has taken up considerable alcohol from previous use is much to be preferred to a new silver bath.

The formula I have found best was recommended to me by Mr. William H. Rau; it is composed as follows:—

Alcohol .....	1 ounce.
Ether .....	1 "
Best gun-cotton .....	4½ grains.
Ammonium iodide .....	5 "
Potassium bromide .....	2½ "

In making the collodion I first measure the alcohol, then dissolve the iodide of ammonium in it. Grind the bromide of potassium in a mortar, adding a few drops of water. Add the alcohol containing the iodide gradually to the contents of the mortar, grinding constantly until all the bromide, or nearly all, is taken up.

Transfer the clear solution to a bottle.

Next measure out the ether and add it slowly, shaking the bottle by a circular motion until all is mixed, then add the cotton and set aside to ripen, which will require four or five days. It should have a deep sherry-wine colour. If this colour is not obtained, which happens sometimes by reason of the kind of iodide used, add tincture of iodine until the desired colour is secured.

In coating the plates use a thin flow of collodion, and, when the plate is well set and tacky, dip in the silver bath, where it must remain, moving it at times, until all greasiness disappears.

Give very full exposures; never undertime a wet slide.

Develop with the following:—

Water .....	16 ounces.
Protosulphate of iron (clear crystals) .....	1 ounce.
Acetic acid (No. 8) .....	4 ounces.
Honey .....	2 "

The image will come up gradually; let it develop until all the detail



comes up, but do not let the slide get any density by the development. Wash well under the tap and intensify as follows:—

a	Pyrogallic acid .....	24 grains.
	Citric acid .....	24 "
	Acetic acid (No. 8).....	$\frac{1}{2}$ ounce.
	Water .....	24 ounces.
b	Nitrate silver.....	40 grains.
	Citric acid .....	10 "
	Water .....	8 ounces.

Take of (a) in a glass sufficient to well flow the plate, and add to it a few drops of (b); pour over the negative, return to the glass, and watch the progress of intensification. If necessary, repour with the intensifier and continue the operation until the slide has reached the proper density, remembering that it loses scarcely anything in the fixing.

Wash well before fixing to prevent stain from the combination of the silver and pyro in the hypo.

The slides so made are the finest I have ever seen, even if I do say so myself, and I think those who try it successfully will agree with me in my decision. There is a beauty, clearness, and a wealth of shadows secured which have made Mr. Rau's lantern slides so celebrated, and the only ones on the commercial market that are equal to the renowned Levy or Laschenel slides of Paris, which are made upon albumen plates. Generally the tone of the slide after intensification is pleasing enough and needs no change, but sometimes from slight errors in exposure, or it may be from the character of the negative employed in making the slide, a modification of the tone is necessary.

I have found palladium or platinum the most pleasing toning agents, especially the latter if one desires a black tone; palladium gives a beautiful purplish-black. Both toners should be used very dilute, the toning being carried on in a shallow porcelain or glass dish, and the solution kept in constant motion like the development of a dry plate.

If used too strong, the toning goes on too rapidly and extra intensification is produced, and sometimes the shadows are clogged.

Platinum has more tendency to do this than palladium.

Platinum is best employed in the following manner, which gives a most beautiful warm, brilliant, black tone: One grain of bichloride of platinum in twenty ounces of water; neutralise it with pure carbonate of soda, and then slightly acidify it with chemically pure nitric acid. Proceed in the toning as above.

#### ACETYLENE GAS.

On account of its brilliant illuminating powers, and the pure white light which it gives, approaching more nearly to sunlight in its effects than any other artificial light invented up to the present time, acetylene has come largely to the front, especially among photographers, during the last few years, and of course, as in all cases where scientific or chemical reactions are concerned, the people who use it are generally in almost absolute ignorance of those reactions, and consequently some accidents have occurred, and acetylene has fallen somewhat into bad odour with the Government and fire insurance companies. As is usual in such cases, most if not all these accidents might be prevented with a little care. All, or nearly all, innovations meet with a certain amount of opposition, and when that innovation is attended with even a slight amount of danger, that opposition is intensified. Every kind of illuminant is attended with some danger, but with ordinary care this is reduced to a minimum, and then the prejudice gradually dies away. Coal gas is almost universally used now, but when first introduced many people would not have the pipes laid close to the wall, as they imagined that the flame travelled along inside the pipe, and that the latter was liable to get red-hot and thus cause a fire, while Sir Humphrey Davy proved that flame will not travel through an open pipe, much less a closed one. Gasometers, again, were viewed with alarm at first, as people were afraid they might catch fire and explode, this, again, being a physical impossibility, as coal gas cannot explode unless mixed with at least seven parts of air. It will be very unfortunate if the progress of such a good and useful illuminant as acetylene is retarded by carelessness and ignorance of its nature and properties.

Acetylene as an illuminant is not by any means a new discovery, having first been discovered accidentally by Edmund Davy during some chemical experiments rather more than sixty years ago, when he produced a compound of potassium and carbon which, on the addition of water, gave a highly inflammable gas, which he is believed to have called "Klumene." Nothing much seems to have been done with this until 1859, when Berthelot, the celebrated French chemist, produced a gas by passing a current of hydrogen through the electric arc, and, as on analysis he found this greatly resembled acetyl in its chemical properties, he called the gas acetylene, the name by which it is still generally known.

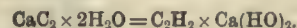
We are indebted to the great German chemist, Wöhler, for the next step onward in the production of acetylene gas. He found that, by fusing together a mixture of zinc, calcium, and carbon, he produced a compound which, on the addition of water, gave acetylene gas, and thus formed the first calcium carbide. All these experiments and discoveries, although useful from a chemical and scientific point of view, were no good for the

production of acetylene upon a commercial scale, on account of the difficulties attending the manufacture of carbide, and the consequent high price, and it was not until 1889, when Willson in America and Moissan in France, independently and accidentally, discovered that, by fusing calcium oxide and carbon in an electric furnace, calcium carbide was produced, and made acetylene gas a commercial possibility. Carbides of other metals may be produced in this manner which also give acetylene by decomposition with water; but, as calcium is the cheapest and most plentiful, besides being found in a fairly pure state in the various calcium salts, more particularly in lime and chalk (carbonate of lime), it has naturally been chosen for the commercial production of carbide. Acetylene, the chemical formula of which is  $C_2H_2$ , is a clear, colourless gas, which, when the carbide is pure, contains as much as 92½ per cent. of carbon.

The burners used for acetylene require to be constructed somewhat differently from those for coal gas, or when they get hot they cause a deposit of carbon in the apertures, thus stopping the flow of gas. On account of the high illuminating power of acetylene, the apertures of the burners are not usually made very large; the largest, as a rule, do not pass more than 1 cubic foot of gas per hour, giving at this rate a light of about 50 candle power, while coal gas burnt at the standard rate of 5 cubic feet per hour gives a light of about 16 candle power, acetylene thus possessing about fifteen times the illuminating value of coal gas. A great advantage with acetylene is the small amount of oxygen necessary for its combustion, it only requiring about one-eighth that of coal gas. The products of combustion also are not nearly so injurious. The acetylene flame is likewise much cooler than the flame of coal gas under ordinary conditions, though, if burnt with its own volume of oxygen, it almost rivals the heat of the electric arc, which produces the highest temperature known at present. At first sight it might seem an easy matter to produce a good and portable acetylene lamp, but this is not altogether the case, several of those in use, for bicycles in particular, having very grave faults. In one type the water is at the top, this being a disadvantage, as the heat quickly evaporates the water, and, where the lamp is required for a length of time, the water gives out, and, if as often happens in dry weather in the country, it is difficult to procure a fresh supply; also, should the water get hot enough to drive off the carbonic acid gas contained in hard water, the precipitate may clog the fine water tube and prevent the lamp acting. With this kind the flame is regulated by the amount of water allowed to fall upon the carbide, which is rather a good arrangement, but in another type the flame is regulated by a tap in the same manner as ordinary coal gas; and upon the face of it would seem a better way, but upon examination we find that a vent hole is left in the generator, so that an excessive pressure may not be attained, and any gas not used escapes into the atmosphere, a very bad thing when indoors. Undoubtedly the best method is to have a kind of gasometer where the gas can accumulate if it generates more quickly than it is used. The drawbacks to this are the greater space required for the apparatus, and the risk of explosion if a greater pressure than 30 pounds per square inch is attained unless the gas can be kept cool, though, if the apparatus is properly designed, too great a pressure should automatically shut off the water, and thus obviate any risk. Unless the gasometer style can be adopted, the flame should always be allowed to burn out of its own accord, or the gas will escape and explosions may follow if in a building or room where it cannot get away. Fortunately the very strong and disagreeable smell of acetylene (1 part of acetylene in 10,000 parts of air being noticeable) indicates its presence very quickly, so that the risk of explosion is not nearly so great as with coal gas, but in any case it is better not to allow it to escape. Acetylene gas has a longer range of explosibility than in coal gas, as it explodes when a mixture of 1 part gas to 20 of air is reached, while coal gas will only explode when the mixture contains 1 part of gas to 15, and, in rare cases, 16 of air.

Acetylene is known in chemistry as ethine, and is generally found to a small extent in coal gas, it is also produced in all cases of incomplete combustion, notably when a Bunsen burner lights back; this was originally thought to be very poisonous, but has been proved not to be so.

Acetylene,  $C_2H_2$ , is produced, for commercial purposes, by the action of water,  $H_2O$ , upon calcium carbide,  $CaC_2$ , by double decomposition, thus:—



Calcium carbide is manufactured by fusing lime or chalk with carbon, in the form of coke. This fusion requires a very great heat, which at present can only be attained in the electric furnace. The demand for calcium carbide is increasing, and is likely to increase, and this opens out a new source of revenue for electric-light installations during the daytime, when little current is being used, as no means other than the electric furnace have yet been found of producing calcium carbide, which, as usually manufactured upon a large scale, is formed by feeding a mixture of three parts coke and two parts lime into the furnace, where it quickly fuses; these proportions are found most suitable for working; but, as the carbide is a chemical compound, no matter in what proportions the two ingredients are mixed, the resulting carbide is always the same, as its formation is governed by the well-known chemical law of combining proportions.

If the temperature is kept at the freezing point of water, acetylene



may be compressed to a liquid by a pressure of about 325 lbs. per square inch, and then becomes a limpid fluid, which is being used for lighting trains and buoys.

Calcium carbide, being of a very hygroscopic nature, must be kept in air-tight tins or boxes, or otherwise it quickly deteriorates by evolving gas, and, on account of the carelessness displayed in handling and storing it, a Home Office order has classed it among the "dangerous" goods, although by itself it is not an explosive compound.

Much trouble has been caused by carelessness in filling the generators too full of carbide. This is a very serious matter, as carbide in decomposition increases almost 100 per cent. in bulk, therefore no generator should be more than half filled with carbide, to allow for this expansion, or the generator may burst. One pound of carbide requires about 8½ fluid ounces of water for its decomposition, and this should produce 5 cubic feet of gas, if the carbide is pure, which is the quantity generally guaranteed by British carbide-manufacturers to be obtained from 1 pound of carbide. To be used economically, no more carbide should be wetted than is sufficient to generate the amount of gas required, unless the gas can be set red, as the carbide will absorb water from the residue of lime, and continue to evolve gas, thus entailing loss.

Acetylene is nearly a pure gas, free from sulphuretted and phosphoretted hydrogen, and the spectrum of it greatly resembles the solar spectrum; consequently it is very suitable for, and has been largely used during the last few years in photography, and careless photographers with imperfect apparatus, if they investigated the matter, could, no doubt, trace the deterioration, and in some cases spoliation, of their chemicals, plates, &c., to the fact that they have paid no attention to their generating and lighting apparatus, and consequently they have allowed the gas to escape and spoil their stock, as, although acetylene is much heavier and denser than coal gas, and thus cannot escape so fast, besides which it is purer, chemicals, &c., left in a constant atmosphere of acetylene are bound to deteriorate.

Acetylene is very suitable for photographic lantern and dissolving-view work, being much more portable and convenient to use than the oxyhydrogen, or, as it is more commonly called, limelight, and it has the additional advantage of occupying less space, besides being more economical.

One very great advantage of acetylene is its portability and the small plant required to form the gas, for, as the latter is formed synthetically by the nascent union of its elements, it is produced in an almost pure state, consequently it does not require the elaborate and expensive purifying apparatus necessary for gases obtained by the destructive distillation of carbonaceous compounds, and in places where it would be difficult, if not almost impossible, to obtain coal gas or electricity, acetylene may be used with advantage, although at present it is somewhat dearer than these in towns; but, as the demand for calcium carbide increases and the methods of production improve, a great cheapening of the carbide may be expected, and acetylene may eventually prove the cheapest as well as almost the best illuminant, for by its aid delicate shades of colour may be noticed—an advantage possessed by hardly any other illuminant; this should prove especially useful to drapers and others for matching and detecting shades of colour, and to photographers for toning after dark, as, although by practising in a particular light a fairly even tone may be obtained, it is not possible to get the tones so exact except by daylight or by the light of acetylene, which may also prove a great boon to photographers in another way, as, owing to its rays having a similar actinic effect upon printing-out paper to that which sunlight has in the winter time, when the weather is foggy and dull and printable daylight is reduced to a minimum, prints may be made by its aid, and to a busy photographer, at his wife's end to produce photographs to time under present conditions, the advantage cannot be over-rated. Owing to the extra cost, it is very unlikely to be used when daylight is available, but, as very often in the winter time this is not to be obtained, the probable increase of business, coupled with greater freedom from worry, may be set against the extra cost. The writer's experiments in this direction have not been sufficiently extensive to give an idea of the probable cost, which may prove rather high, as a strong light is necessary, and, of course, the stronger the light, the greater the cost; but, on the other hand, the stronger the light, the more photographs may be printed by its aid. It will be gathered from this that printing-out-paper must not be left exposed to the rays of acetylene or discolouration will take place.

For working economically, the waste residue of lime should always be cleared from the generator before putting in a fresh lot of carbide.

During the decomposition of the carbide the generating chamber gets very hot. Chemists explain this by the fact that, as such an enormous amount of heat is absorbed in the manufacture of the carbide, a certain proportion is given off in its decomposition.

Calcium carbide may be stored in quantities not exceeding five pounds without a licence, providing it is kept in air-tight metal boxes, holding not more than one pound. If more than five pounds is required to be kept, a licence must be obtained, price 5s., which must be renewed annually. These restrictions, combined with those of the fire insurance companies, are all against the progress of acetylene as an illuminant, much less for motive power, for which it is also applicable; but, no doubt, as it is better understood some at least, of the restrictions will probably be relaxed.

C. T. SUTTON.

## WEAR AND TEAR IN LIMELIGHT APPARATUS.

DURING what may be termed the off season is the time when lanterns and limelight apparatus are generally stored away, and but little thought bestowed upon their condition, a state of matters that very probably is, with a large number of lanternists, allowed to continue till the autumn begins to set in, when they suddenly waken up with renewed interest at the approach of another lantern season, only to find their lantern and all its belongings in a sorry condition, from sheer neglect and carelessness for months past.

But few lanterns or parts of a limelight outfit will do a fairly heavy season's work without showing signs of wear and tear, and the renovation of them is, without doubt, best accomplished with as little delay as possible. Every one knows how insidiously rust will appear and make its presence felt even on the face of things. There is, however, a far more hidden source where rust, if allowed to remain, will certainly cause deterioration in one of the most vital parts of a lantern outfit, and it therefore is time well spent when any one who takes interest in lantern projection devotes a portion of an evening to a thorough overhaul of his apparatus before storing it away till another season.

Among the various parts of a lantern outfit most liable to suffer from wear and tear is the jet. Somewhat recently a jet was handed to me by a gentleman, who was loud in his praises of this particular pattern, with the request that I should give an opinion as to what had gone wrong with it, for towards the close of the season nothing like previous results could be derived with it, and, as he said, it was running away with nearly double the amount of gas it burned at first without yielding anything like the light. The jet in question was of the very best workmanship, being made by one of the leading English makers, and was in every sense a really good article, and when in proper condition was capable of yielding an honest 900 or 1000 candle-power light without any undue noise; but, in the condition into which it had been allowed to drift by reason of sheer negligence, it was impossible to get anything like such results, for the moment a fair amount of pressure was admitted to the mixing chamber on went the hiss at once.

On taking the jet to pieces and examining the mixing chamber, it was at once apparent what was wrong. By careless manipulation some rather violent snapping of the jet had been allowed to take place, and this had actually ruptured the packing of the jet to such an extent as to literally blow holes, that formed apertures of at least an eighth of an inch, right through the copper gauze, forming small cones through each disc from the bottom to the top of the chamber. The damage was so great as to completely destroy the packing, upon which so much depended for a silent light in the particular pattern of jet referred to. It was, therefore, no wonder that the jet could not be made to work with the usual pressure, or give its best results in the way of light.

For a time it was thought that all that was wanting to bring the jet into its original condition was a supply of new packing formed of alternate rings and discs and pieces of gauze that entirely filled the mixing chamber, and these were provided; but, even when they were placed into the chamber, and any one naturally would have deemed the jet as good as new, something was still wrong that for a time gave a fair amount of trouble to find out. The jet, after being packed and tried on the screen, seemed to run away with more gas than it should, when the aperture of the nipple was taken into consideration, and there was just a semblance of unsteadiness in the light that ought not to be present in a perfect jet. For a time this unsteadiness was attributed to jerking of the springs of the regulators, but, on trying others, the same fault was still present. Then the rubber tubes were tested for punctures; but no, for by this time I had formed an opinion that there was a leakage of gas somewhere; but, having so recently overhauled the jet, I never for a moment dreamt of looking for a leakage in the mixing chamber. After several tests, I was at last driven to the conclusion that the jet was still faulty, and then arrangements were made by utilising two of Clarkson's original rubber regulators, which were perfectly tight. To test the soundness of the jet, the rubber tubes were attached to the regulator, and by their means they were inflated to their full extent. The tubes were then attached to the jets, and the orifice of the nipple plugged, when the jet taps were turned full on. No sooner had this test been applied than the flaw was discovered, a very heavy leakage of gas was found to be coming from under the screw covering cap of the mixing chamber, a leakage permitting a quantity of gas quite as great as was passing out of the nipple when the full pressure was applied to the jet. A slight inspection showed that the washer that was fitted under the base plate of the nipple had been practically destroyed by the heat or the snapping of the jet, or the wear and tear, and was not causing a tight junction between the chamber and the nipple plate. A disc—or, rather, a washer—of thin asbestos card was cut and fitted to the top of the chamber, and this at once cured the jet, which gave magnificent results straightway.

But few people have any idea of the care necessary in working a really first-class jet, and I have known one of the best modern patterns of jets almost ruined by being hired out into the hands of a novice who really did not know how to work such. Much of the success of a jet and its working lies in a proper knowledge of the distance at which to place the nipple from the lime, and with novices it is just here where so many get astray. Some I have met with seem to have an idea that a mixing



jet should be brought as close to a lime without touching as possible, and very probably that belief has been engendered by reading some old treatise on the lime light that was written before the advent of compressed gas in cylinders. At any rate, the practice of bringing a powerful jet too close up to the lime is soon disastrous to the nipple, and, when this part of a jet gives out in the middle of an entertainment, it is a bad job indeed. Yet I am told by opticians that the burning of nipples by careless adjustment of the distance of the lime from the nipple is a very common occurrence. Therefore, at the close of a season, the nipples of all jets, even where they have been carefully manipulated, are almost certain to show symptoms of wear and tear, and, when this is seen to be of any importance, fresh nipples ought to be screwed on. Any maker of jets will supply new nipples, and, when purchasing a jet, it is well to lay in a few spare ones as a stand-by against such eventualities. Many an otherwise perfect jet is practically discarded and thrown aside as done by reason of hissing from a faulty nipple, and an entirely new jet provided at a considerable cost, when all that is really needed is the provision of a new nipple at the cost of a shilling or so.

With large-bore jets platinum-tipped nipples are liable to give way unless the platinum is carried a long way down the nipple. Smaller apertures, however, when the jet is well taken care of, may be made to last for a considerable time. Nipples made of hard brass are quite as serviceable, much cheaper, and a few of them can be kept on hand and made to replace one that has given out quite as easily as the screwing of a nipple into an ordinary gas pipe.

Regulators do not last for ever either, and at the close of a season these should be subjected to a thorough overhaul, and made to cut off the gas entirely when the pressure from the cylinders is partially applied. Some of the good old patterns are still found doing useful service where they have been carefully preserved, and not a few clever operators in the West of Scotland are still to be found who admire the rubber-bellows form, simply because they can see when they are having their supply of gas all right from the cylinders, and so know just when to turn on a little more pressure from the main supply. These old forms of rubber regulators, although they possess some very good points, do, on the other hand, give uneasiness by reason of their leaking from wear and tear, but they are easily overhauled and made perfectly tight by using a small portion of a broad indiarubber band, or piece of very thin rubber sheeting, and a little indiarubber solution. There is, however, a proper way of applying the latter to the rubber bag as a patch; the solution should first of all be applied to both, and allowed to set until it has become almost hardened, the two surfaces are then brought into close contact and pressure applied, after which there will be no leakage. There is also another very simple method of stopping a leak in an indiarubber gas-holder, and one which for years was used when gas bags were in general use, it is merely taking a piece of ordinary sticking plaster and applying the same as a patch to the faulty part, and this does most efficient service at a pinch. With nearly every pattern of regulator there is some weak spot in its construction; if it is not one thing, it is another; the main object, however, should be to make a point that, whichever pattern is used, every care be taken to see that it is in perfect condition. Some operators declare that at times they are prone to yield a jerky light by reason of their springs not working smoothly; this all shows the need for regularly overhauling them during the off season.

The optical parts of a lantern seldom give much trouble when they have been well taken care of. Carelessness, however, sometimes causes damage to the front lens of a condenser by forcing a carrier across its face when the lens is too far forward in its jacket; the result of this is sometimes seen in nasty scratches right in the centre of the front lens, and these scratches, of course, show up as dark patches on the screen, especially where long-focus objectives are employed. If these scratches are not very pronounced, they may be rubbed down by the exercise of a large amount of patience with the aid of elbow grease, a pad of silk, and a little rouge powder. Any damage to the front lens of a condenser is always badly seen on the screen, and, if these are merely superficial, they may be rubbed down as stated; but the operation is one entailing a lot of continuous hard rubbing for several hours from day to day. More serious flaws are only to be dealt with by the practical lens-grinder. A good condenser is well worthy of care, and I often think this is the most essential part of a lantern outfit.

Rubber tubing, after being in use, is liable to contract damage; in fact, it is seldom above suspicion of having deteriorated at any time. It is therefore advisable to test it by plugging one end, and inserting the tubes in a pail of water, and then inflating them; if there be any leakage, this treatment will soon display the weak part.

Dissolvers generally take some time to get into good working order, and frequently have to be doctored. These will require overhauling also, but, where they have not suffered damage in packing or by other rough usage, they can generally be kept in good condition by cleaning the passage ways and screwing the parts up tight.

Where a wooden box or cabinet is employed for packing a limelight outfit, it will hardly ever be found to do service for a season without showing wear and tear. In single lantern outfits it looks as if boxes or iron cases are soon to be discarded for the purposes of packing. I know of one very superior single-lantern outfit in which the entire apparatus, including a twelve-foot linen sheet, is all packed, with the exception of

the jet and lenses, in a stout rubber-cloth hold-all, and I can testify to the practicability of employing it. The lantern in question is practically capable of being taken to pieces, i.e., there are no telescopic fronts to take up room, the objectives are placed on uprights at the end of a travelling platform. This platform and its upright is easily taken to pieces also, and it is quite surprising into what a small bulk the whole apparatus can be packed; in fact, the whole baggage, when the lenses and jets are carried separately in the pocket, takes up no more room than a half-plate outfit, and no one would ever dream of such being a lantern with its accessories.

It would appear as if open stages will be more employed in first-class lanterns in the future. There certainly is no need for the elaborate telescopic fronts hitherto seen in all our lanterns. Any one who has experience of working an open-stage lantern will readily admit the advantages it possesses, not the least being the saving in bulk, for all the parts can be folded up flat, taking hardly any space in packing. A really well-made jet should have a case to itself, and after being used should be carefully placed in the same, and such small cases are capable of being carried in a top-coat pocket apart from the lantern outfit entirely.

We hear a great deal from time to time about elaborate attachments to lantern cabinets for the purpose of tilting the lamp to any desired elevation. I have always striven to do with the least possible amount of accessories, and never could see why some writers should devote whole pages of our photographic journals in which elaborate diagrams are displayed over such a trivial matter. My earliest connexion with the lantern, now very many years ago, effectually solved the problem of elevating the front of lanterns in so simple a manner that I often feel surprised writers should ever think of spending so much time and thought over such a trifle. The best tilting arrangement any one can possibly use consists of the back of a printing frame. This simple contrivance folds up into little or no space, and can be made to yield any elevation by the exercise of several different methods of using it, which any intelligent lanternist can find out for himself.

A. T. NEWTON.

#### NEWS AND NOTES.

THE flame of acetylene is exceedingly useful for hard soldering, says *Neueste Erfindungen und Erfahrungen*. Its temperature is as high as can otherwise be obtained only with a special blowing apparatus. The heating power of acetylene is likewise very great. The use of acetylene is particularly in place where no connexion with a gas house or electric central station can be had.

IN order to prevent the danger of an explosion in acetylene burners, it has been proposed to lead the gas on its way to the end of the burner through a few small chambers filled with glass wool (spun glass). Owing to the fact that spun glass acts like a filter, the acetylene is, before burning, freed from all impurities which might have been carried along. Besides, these spun-wool filters also serve the purpose of preventing a falling back of the flame and rendering it harmless even in case an explosion should occur through some cause or other.—*Neueste Erfindungen und Erfahrungen*.

A NEW method of illumination on the ocean consists of using a hollow cylinder of steel tubing charged with calcium carbide. This shell is to be shot from a gun to a distance of two miles. When it strikes the water it generates acetylene gas and gives 1000 candle power, which burns from the end which floats. This light cannot be extinguished by water.

TRIBOLUMINESCENCE is a name lately given to the emission of light without heat that occurs on crushing certain substances like sugar. The phenomenon has been found by Mr. William J. Pope to be particularly striking in saccharine under certain conditions, the bluish-white flash when the crystals are broken in any way being noticeable in a well-lighted room; but no light appears when the saccharine is pure, or when the crystals are prepared in any way except by evaporating a solution in acetone, or after the crystals have stood a few weeks. Other substances showing the strange phosphorescence are hippuric acid and certain derivatives of santonin. The cause is still a mystery, but recent study seems to indicate that the light is due to some peculiarity of crystalline structure.

A SINGULAR discovery reported by M. Mourel to the Paris Academy is that specially prepared sulphides of strontium, calcium, barium, and zinc are made much more brilliantly phosphorescent by exposure to diffused daylight than to direct sunlight, and that periodical exposure to diffused daylight remarkably increases the phosphorescent power. A portion of the material brought to the sensitive state may excite phosphorescence in another portion, even in a separate glass tube.



THE *Westminster Gazette* has received from a correspondent who has been looking into the matter at the Patent Office a communication with reference to the remarks it has made from time to time as to the approaching expiration of important Welsbach patents. He observes that no patents which may have been acquired before 1885 are of interest in the present circumstances, for the fourteen years' protection has expired. On the other hand, recent patents since, say, 1890, have another six years or more to run. But there are important patents dated about 1885 and 1886, leading patents, associated with the name of Welsbach, and protected incandescent mantles and burners. The first of these, and the one to which most importance may be attached, is 15,286 of December 12, 1885—a leading patent for several others. This protects the method of preparing the incandescent caps or hoods by saturating them with a solution of rare metallic salts. This patent will expire before the end of the present year. The next in time, and one also very important, is of date March 13, 1886. It also covers a method of preparing mantles, and terminates next year. A third patent in July of the same year (1886) protects atmospheric gas burners specially designed for use with the mantles described in the 1885 patent. This runs out about the middle of 1900.

THE Berlin correspondent of the *Daily Chronicle* says that some remarkable experiments with the cinematograph in the service of medicine have just been made in Kiel before a select company assembled in the University. There were present the Prince of Monaco, Professor Von Esmarch, the famous surgeon, and numerous doctors, professors, and medical students. The celebrated French surgeon, M. Doyen, who had charge of the experiments, explained that no work on surgical practice was able to describe operations so carefully and fully as to avoid the possibility of erroneous treatment by the operator. M. Doyen, by means of certain alterations in the cinematograph, has been enabled to take a perfect series of pictures of various kinds of operations, from the first cut of the knife to the laying on of bandages. Every phase of the operations was thrown on the screen with marvellous accuracy. M. Doyen insists that his invention will be of incalculable benefit to students of surgery. The French doctor received an ovation from the medical students assembled to witness the experiments.

#### KINEMATOGRAPH EFFECTS.

APART from its utility as a newagent there seems to be quite a number of less ambitious, but not less profitable, uses to which the cinematograph is likely in the coming season to be applied. Having successfully mirrored nature in motion, the machine is to be utilised to display certain manufactured effects which when duly projected exhibit beautiful and astonishing phenomena, in which colour and various ingenious surprises are included. Prominent amongst workers in this direction is Mr. J. Williamson, of Hove, who recently showed us a number of his forthcoming novelties which vastly interested us. It would at this date hardly be fair to publish particulars of the above, enough that they include several sensational developments which will not only be greatly appreciated at evening entertainments, but should become valuable media for advertising purposes.

#### SOME GERMAN ACETYLENE STATISTICS.

Two of the German acetylene journals have become interested in the statistical side of that industry, and have collected and published considerable data upon the subject. One of these journals, *Das Acetylen* some time ago, sent out fifty-two blanks and received thirty-seven answers, from which, with collateral information, the following figures were derived.

In 1898 in the German acetylene apparatus shops there were sold—

Generators .....	6,451
Burner capacity of each generator .....	1 to 300
Total burner capacity .....	112,355
Candle power of burners in Hefner candles .....	10 to 60
Candle power of burners in Hefner candles, total .....	3,182,100
Average burner capacity of generator .....	17
Average candle power of burner in Hefner candles .....	28

The demand was greatest for apparatus having a capacity of fifteen to thirty burners.

Upon the basis that the generation of one Hefner candle (0.888 English candle, requires 0.0265 cubic feet of acetylene, the above capacity of 3,182,100 candles would require the consumption of 84,325 cubic feet of acetylene. If one pound of carbide generates 4.8 cubic feet of gas, there was therefore required a supply of 17,567 pounds of carbide per hour, or, on a basis of a yield of 4.46 cubic feet per pound, an hourly consumption of 19,000 pounds of carbide. Counting 1900 burning hours per year, the yearly demand for carbide was respectively 16,688 and 18,050 short tons. Taking the price of carbide at 4 cents per lb. or \$80

per ton, we see that the sales must have aggregated, for 16,688 tons consumption, about \$1,335,040. This sum doubles itself when we consider that but about half the German and Swiss production of carbide is used in these countries, and therefore that at least \$2,770,000 worth of carbide was turned out during 1898.

Generators having a capacity of twenty-five burners are most in demand, and most of this size are sold. The average price being \$125, and 6451 of these being sold would bring the total up to \$806,375. Calculating that one burner costs 25 cents, the 112,355 burners going with these generators will cost \$28,089. The carbide works and acetylene apparatus manufacturers in Germany, therefore, did a business in 1898 amounting to \$8,604,464.

The nine largest acetylene firms in Germany have a capital of \$1,122,500, and the small firms, having a capital under \$25,000 each, will aggregate \$153,750, making a grand total of \$1,276,250. There are 1020 men employed in the shops.

The practice seems to be to make the distribution pipes not so strong as ordinary city gas pipes above 1.5 inches diameter, and to have them with but one-third the cross-sectional area for the same service. The valves and fixtures are made of brass, rod castings (75 to 80 per cent. copper), white metal, and iron. Practice has shown that the fear formerly existing as to the formation of explosive acetylides of copper has no foundation.

For generator construction, with few exceptions, leaded iron is used, the plates being from 0.63 to 0.016 inch in thickness (Nos. 10 to 12); in one case, a pressure generator, the walls were from 0.23 to 0.58 inch thick. One firm reported the following weight of plate used: 15-flame generators, 0.039 inch; 30-flame, 0.058 inch; 100-flame, 0.078 inch; 150-flame, 0.117 inch; above this, 0.156 to 0.175 inch. Another firm does not go below 0.058 inch plates even for three to six-flame generators. All firms offer the forked burner, some entirely of steatite, and others with steatite heads only, and either angular or of horseshoe shape. In answer to the query as to how many feet of pipe had been laid, seven firms answered that they had put in 533,000 feet of from  $\frac{1}{4}$  to 3-inch pipe.

#### STEREOSCOPIC PHOTOGRAPHS: A NEW METHOD OF TAKING AND EXHIBITING THEM.

THIS is due to Mr. W. K. L. Dickson, and it "consists in the provision of means for varying the angle of divergence between the axes of the pencils of light by which the twin stereoscopic pictures are produced, or transmitted to the eye, without varying the distance between the twin images on the photographic plate or on the stereoscopic picture card, and for bringing the centres of the images on the photographic plate much closer together than the distance between the axes of the pencils of light by which said images are produced, and for obviating the necessity of cutting apart, transposing, and reconnecting the twin pictures of photographic prints made from a stereoscopic negative, in order to prepare the same for exhibition; in the provision of means for varying the distance between the twin lenses; and, generally, in the novel combination, construction, and arrangement of the parts."

Mr. Dickson proceeds:—

"In the taking of stereoscopic photographs it is sometimes desirable to vary the angle of divergence between the axes of the pencils of light by which the twin images are produced, so as to exaggerate or diminish the effect of perspective produced. In the taking of consecutive series of stereoscopic pictures of moving objects, such as are to be employed in the reproduction to the eye of the movements of such objects in what are known as consecutive-view or moving-picture apparatus, it is very desirable to bring the twin images much closer together upon the photographic plate or film than the distance between the axes of the pencils of light by which these images are produced. The photographs usually employed in consecutive-view apparatus are comparatively small, and, if the distance between the centres of the twin images produced by a stereoscopic consecutive-view camera be the same as the distance between the centres of the lenses of an ordinary stereoscopic camera, there is a great waste of film; and the inertia of the excessively wide strip of film seriously interferes with the taking of pictures in such rapid succession as is desirable for the production of the desired effects. Furthermore, in the making of stereoscopic pictures from ordinary stereoscopic negatives, it is necessary to cut apart the twin pictures of the photographic print, transpose them, and reconnect them, or mount them side by side on a common support. It is impracticable to do this with the large number of prints required for a single set of pictures of a consecutive-view exhibiting apparatus.

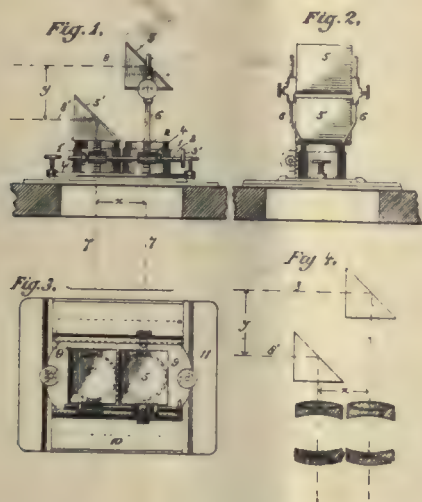
"The objects of my invention are, first, to provide means for varying, in stereoscopic cameras, or exhibiting apparatus, the degree of perspective effect produced, and for bringing the images much closer together than is ordinarily the case in stereoscopic negatives or pictures, such images, however, being, in fact, substantially the same as though observed from points more widely separated than the actual distance between their centres; second, to provide means for obviating the necessity of transposing the twin pictures of stereoscopic photographic prints; and,



third, to make the apparatus simple, durable, efficient, and as inexpensive as possible.

"Fig. 1 is a plan view of the lens mountings, prisms, and connected parts of a stereoscopic photographic apparatus embodying my invention, detached from the camera, a portion of the front board only of which is shown in section; fig. 2 is a side view of the parts shown in fig. 1, taken from the right of fig. 1; fig. 3 is a front view of the parts shown in fig. 1, said parts having been inverted; and fig. 4 is a diagram illustrating the action of the apparatus.

"In the drawings, 1 and 1<sup>1</sup> are the lens tubes of two twin photographic lenses. They are telescopic, and racks, 2 and 2<sup>1</sup>, a pinion shaft, 3, having a thumb screw, 3<sup>1</sup>, and pinions, 4 and 4<sup>1</sup>, are provided, for the purpose of focussing the lenses. In front of the lens tubes are mounted reflecting prisms, 5 and 5<sup>1</sup>. The prism, 5<sup>1</sup>, may be secured directly to its



lens tube, while the prism, 5, may be mounted upon guide rods, 6, in such manner that it may be moved toward or from its lens tube upon said rods. The length of the guide rods is such that the distance between the reflected extensions of the optical axes of the lenses may be at least as great as the distance between the axes of the lenses of an ordinary stereoscopic camera.

"In fig. 1, and also in fig. 4, the lines, 7 and 7<sup>1</sup>, represent the axes of the lenses, the distance,  $x$ , being the distance between them. The lines, 8 and 8<sup>1</sup>, represent reflected extensions of these axes, and proceed from the central point of the reflecting surfaces of the prisms, 5 and 5<sup>1</sup>. The lines, 8 and 8<sup>1</sup>, may be termed reflected optical axes. The distance,  $y$ , is the distance between the lines, 8 and 8<sup>1</sup>. It is apparent that the distance,  $y$ , may be varied by moving the prism, 5, in or out on its guides, 6, without altering the distance,  $x$ . The images projected upon the sensitive plate within the camera are substantially the same as the images which would be observed from points on rearward extensions of the lines, 8 and 8<sup>1</sup>, and differ from each other to the same extent that the images which might be seen from rearward extensions of the lines, 8 and 8<sup>1</sup>, if the prisms were removed, would differ. By moving the prism, 5, in or out, therefore, the angle of divergence between the pencils of light by which the different images reflected on to the sensitive plate within the camera are produced may be varied; and, by varying this angle of divergence, the degree of the perspective effect produced is varied. The distance,  $y$ , when measured close to the prism, is the measure of this angle of divergence, and also serves, by comparison with the distance,  $x$ , to show the degree of concentration of the images upon the negative plate which results from the use of the prisms. From fig. 4 it is evident that the images on the negative are very much closer together than would be the case if an ordinary stereoscopic camera, the axes of the lenses of which are as far apart as the lines, 8 and 8<sup>1</sup>, were used, while the effect of perspective obtained is the same as would be obtained by the use of an ordinary stereoscopic camera with the axes of its lenses as far separated as are the lines, 8 and 8<sup>1</sup>. The reflection of the pencils of light by which the twin images are produced necessarily results in a crossing of the rays of each of said pencils, and therefore results in the reversal, in the negative, of the relations of right and left of the image from those relations which would exist in a negative made by an ordinary camera. This, however, is an advantage, for prints made from stereoscopic negatives produced in an ordinary stereoscopic camera must be cut apart, so that the twin pictures may be transposed and then reunited by mounting upon a common backing. This is well known. The negatives made in a stereoscopic camera constructed in accordance with my invention are printed from with the emulsion side of the negative turned away from the sensitive side of the positive. Were an ordinary stereoscopic negative printed from in this manner, the right

and left of each image would be transposed with respect to the right and left of the object photographed; but, by reason of the reversal which takes place in the reflecting prisms, prints made in the manner described from negatives produced in my camera have the correct relation of right and left in each image as well as the correct relation of the two images. Projection printing is, however, preferable.

"It is sometimes desirable to adjust the distance between the lenses, as the size of image produced sometimes varies, and for this reason the lens tubes are mounted in separate slides, 9 and 9<sup>1</sup>, mounted in grooves in a plate, 10, itself arranged to slide in a direction at right angles to the direction of motion of the slides, 9 and 9<sup>1</sup>, in grooves in a base plate, 11, adapted to be secured to the front board of the camera.

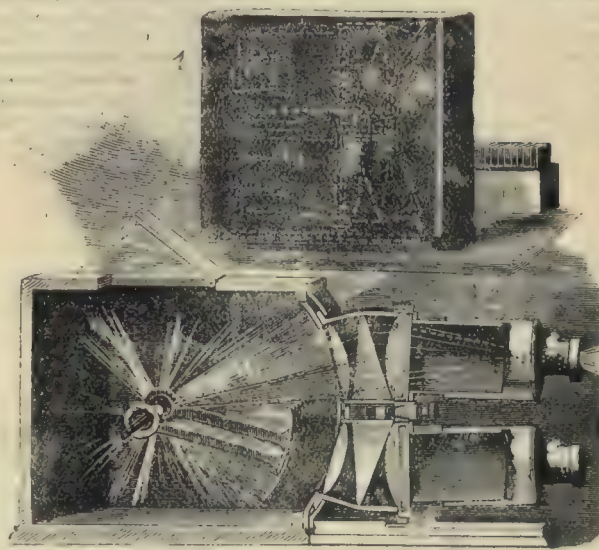
"While this invention has been shown as applied to a photographic camera, it may equally be applied to a stereoscopic exhibiting apparatus, if desired, though ordinarily this will not be necessary. Instead of employing reflecting prisms, as shown, mirrors may be used, the mirrors being equivalents of prisms."

### A NEW FORM OF STEREOPTICON.

A MULTIPLE dissolving-view lantern has been invented by Dr. Samuel E. Woody, 600, West Broadway, Louisville, Ky., which includes various improvements in construction, by which the light is so refracted that the picture from each of the two optical systems appears on the same spot of the screen. It is described in the *Scientific American*.

Referring to fig. 2 of the engraving, it will be observed that two condensers are mounted at the end of the light-casing, the upper being fitted to slide in a segmental guideway on the light-casing so that it can be adjusted relatively to the lower, by means of a wedge interposed between the frames of the condensers. By reason of this adjustment a proper registration of the two pictures projected by the two optical systems is obtained.

Each condenser is provided with two plano-convex lenses, having a prism interposed between them so that the rays of light passing to the first lens are refracted by the prism to the other lens adjacent to the



2.  
A New Form of Stereopticon.

slide-holder. The two lenses of each condenser are inclined to each other, and the interposed prism refracts the rays of light at a proper angle.

The apparatus is provided with a shutter held movably in the light-casing between the light and the condensers. By operating the shutter the rays can be made to pass through one or the other of the condensers.

In the modified form shown in fig. 1, the light-casing, in addition to the ordinary function, serves as a receptacle for the condensers, the slide-holders, and the adjustable tubes carrying the objectives, thus facilitating the transportation of the apparatus. In order to obtain this compact arrangement, the bottom of the light-casing is formed with a dovetail groove adapted to register with a similar groove in an extension hinged to the outer end of the bottom, and forming a cover for the open end of the casing when the several parts are stored. In the registering dovetail grooves a support slides which carries the stereopticon parts. In using the device the extension is swung down and the support carrying the stereopticon is slid out, reversed, and reinserted in its proper operative position.



### THE HYGIENE OF ACETYLENE.

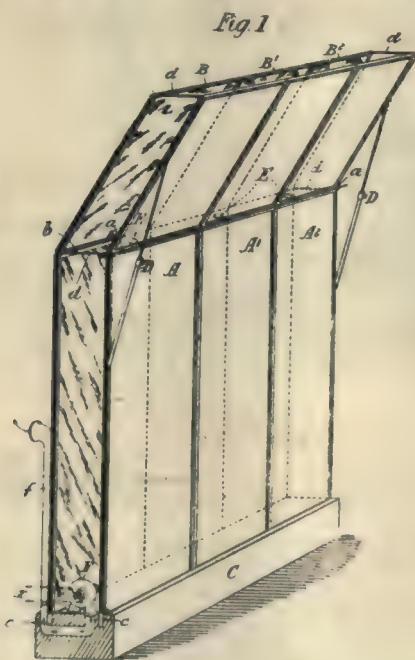
It is strange that, while acetylene is already so largely used and while much has been written concerning its composition, its mode of production, and the burners best adapted for its combustion, little is known with respect to its influence upon health. The facts connected with this can conveniently be discussed under three heads: (1) The action of acetylene gas when mingled with the atmosphere; (2) the action of the products of combustion of acetylene; and (3) to impurities in acetylene. It may be pointed out that, in consequence of the fact that calcium carbide is hygroscopic, this substance is liable to cause the spontaneous evolution of gas by gradually attracting moisture from the atmosphere. An American physician, Dr. Birchmoore, has maintained that even a volume of 0.01 per cent. of this gas in the atmosphere produces headache and sickness. Trouvé has asserted that this gas relieves colds and coughs. According to Gréban, even 20 per cent. of this gas in the atmosphere produces no evil effects when breathed by animals, but with 40 per cent. the mixture was speedily fatal.

Under the second head, after a full consideration of the gases caused by burning pure acetylene, and after comparing them with those obtained by the combustion of common coal gas, it may be affirmed that acetylene under similar conditions, that is to say, with the production of an equal amount of light, vitiates less than one-half the volume of air that coal gas does, and gives rise to far fewer products of combustion. There are certain impurities likely to be present in acetylene, caused by certain substances found in the raw materials used in making the calcium carbide, and they consist mainly of phosphorus, sulphur, silicon, and nitrogen compounds. It is impossible for these substances, except perhaps phosphorus, with common care in the manufacture, to exist in sufficient quantities to cause any ill effects to health.

### FLASHLIGHT PHOTOGRAPHY—BOYER'S SYSTEM.

M. BOTER gives the following description in his Patent specification of the apparatus he has devised for the above purpose:—

"I provide two series of hinged covered frames or their equivalents formed at their sides to fit closely together so as to constitute a compound screen or the inner and outer walls and ceiling of a cabinet or studio, an intervening space being left between the two series. One series of frames forming the outer wall is covered with opaque material, and is preferably provided inwardly with material forming reflecting surfaces, the other series of frames forming the inner wall being covered with a translucent material with a matt or dull surface, so that rays of light passing there-through are diffused. The magnesium or the like flashlights are



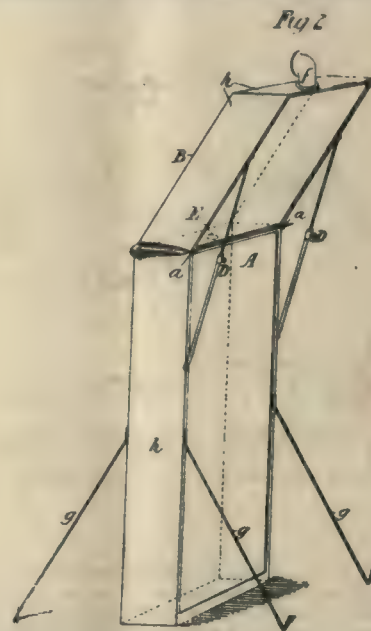
arranged on carriers in the space between the two series of covered frames, and are preferably automatic in action, so that a number of such flashlights can be ignited in quick succession. An adjusting device for regulating the angle between the parts of the frame forming the wall and the parts forming the ceiling is preferably employed, together with a fan or other exhausting device which may be worked by an electric motor

for removing the fumes produced between the inner and outer walls by the burning of the magnesium or the like.

"Fig. 1 illustrates in perspective an arrangement of frames and accessories forming a compound screen or a wall and ceiling, it being readily understood that I may use any number of such frames which may be fitted together so as to constitute an entire cabinet, room or studio.

"Fig. 2 shows in perspective a single compound screen, which may be used complete in itself, for illuminating the subject to be photographed.

"In fig. 1,  $\Delta\Delta^1\Delta^2$  indicate the inner series of divided frames or screens, hinged at  $a$  so that the two parts of each frame or screen can be folded together to facilitate packing.  $\Delta\Delta^1\Delta^2$  indicate the outer series, which are hinged at  $b$ . Each frame or screen is formed with its sides alternately tongued and grooved so as to fit closely together when placed in position,  $c$  being a base with grooves,  $c$ , into which the said screens,  $\Delta$  and  $\Delta^1$ , are slid.  $d$  are telescopic arms for adjusting the angle of the upper part



of the frames relatively to the lower part. The outer and inner frames or screens are connected together at their upper parts by braces or tie rods,  $d$ . The magnesium or the like lights are inserted between the screens as indicated by the dotted lines at  $e$ , and  $f$  is a fan driven by an electric motor for exhausting the fumes arising from the burning of the magnesium or the like, and conducting them outside by the pipe,  $f$ , which may open into the chimney of the room in which the apparatus is erected on lead to an open window.  $x$  indicates the electric conductors for driving the motor. The inner surfaces of the screens,  $\Delta\Delta^1\Delta^2$ , are made of a translucent material with a matt or dull surface and the surfaces of the screens,  $\Delta\Delta^1\Delta^2$ , are made opaque outwardly, and preferably with shining or reflecting surfaces inwardly.

"In fig. 2 the compound screen,  $\Delta B$ , is arranged to be used separately, and in this case without a fan; the pipe,  $f$ , for exhausting the fumes, may be placed at the top of the apparatus, from which a pipe may be taken to the window or chimney.  $g$  are supports for holding the screen upright, the sides and top end,  $h$ , are shown closed in, to prevent the escape of the fumes into the studio, the other parts of the apparatus being similar to those already described with reference to fig. 1.

"When a portrait is to be taken, the studio or screen is set up and the light or lights arranged in any desired number and positions in the intervening space is or are ignited by any suitable means; the chamber or studio or screen will then be found to be flooded with a diffused light, shed through the inner translucent walls and reflected back from the inner surfaces of the outer walls without causing a glare to the person being photographed, however brilliant and numerous the lights in the intermediate space between the two walls of the studio or screen may be."

Electricity, which is published in New York, describes an electric double-ray head light for use on locomotives, which, if found to fulfil its early promise, should be of great service on our railway systems. A plane reflector is attached to the head-light case at an angle of  $45^\circ$  in such a manner that one-third of the total candle power of the head light is projected vertically in the air to a distance of 1000 or 2000 feet, making a beam of light which can be seen from any point from within a radius of from five to ten miles, according to the condition of the weather, and thus one can approximately locate the position of a locomotive approaching from any direction.



## MONTHLY SUPPLEMENT

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[August 4, 1899]

# THE LANTERN RECORD.

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### LANTERN MEMS.

WITH one of the hottest Julys that have been experienced for many years past, and a near approach to, if not an actual record, of continuous sunshine, one may be excused for directing thoughts to other subjects than lantern matters, especially when one's professional duties cause one to "dwell in tents" for the whole of the month. To see the unbroken curves of the registered sunshine on the chart of Jordan's photographic sunshine recorder, representing a record of nearly fourteen hours continuous sunshine, is sufficient evidence of the energy of King Sol, and when one looks at the solar radiation thermometer, and finds it shows 146° F. in the sun, an excuse is easily found for not entering into other matters than business or private reasons necessitate.

My annual outing at Bisley Camp and in Ireland is now over, and I am once more back to the comforts of civilised life, but whether the dwellers in houses are better off than those who have only canvas to cover them at night is a problem I will not attempt to solve; all I know is that under canvas, at a temperature of 90° F. with the air, or what can be obtained of it, blowing through the tent, is trying enough, while most houses have a shady side, and, if one can pick and choose positions for working, the balance should be on the side of bricks and mortar. If the seasons were consistent, and we were sure of such summer weather as that experienced last month, then a "siesta" would have to be an established matter for business men as well as those who can control their movements in order that work may be performed in reasonable comfort.

Now to optical matters. Everything in turn seems being recorded by photography, and the list of scientific and other work accomplished by cinematograph and kindred cameras would be too long for insertion here. I have, however, recently been associated with the construction of a camera for recording flashes of light, as performed by the movements of a silver mirror attached to a key that can be worked as a tapper, and permits of the duration of the flash being short or long, so as to send signals by the Morse code, such as is done by the heliograph. The new apparatus, which has given successful results, and is appreciated by the gentleman who gave the order for same, and enumerated the conditions to be fulfilled, is fitted with a narrow sensitive film, which passes from

one light-tight box, through the camera, into another light-tight box, and during the passage receives the impressions of the heliograph flashed from a moderate distance.

The clockwork and other arrangements for controlling the film have been very ingeniously devised and carried out by the mechanic who was intrusted with the work, and the perfect manner in which the rate of movement of film can be varied leaves nothing to be desired, while the stopping of the film is certain, and any portion of the exposed film can be removed and developed as desired, and another light-tight receptacle put in place of the one removed to hold further exposures. The record of long or short flashes was shown by broad or narrow bands, made by the light passing through a narrow slit in a metal plate, immediately in front of the film, the breadth of the record depending on the rate of the movement of the clockwork and duration of flashes. The details as to finders, adjustments, and stand were matters that had to be considered for convenience of working, but were of the ordinary commercial patterns. What, however, was accomplished was a complete control of the movement of the film by a very sensitive regulator to the clockwork that enabled the film to be passed through at any speed desired, to suit the particular "sending" of the heliograph message which in turn was thus recorded.

I SAW it recently stated that the man who can first invent a practical electrical storage battery of moderate size and weight will, in a short time after its introduction and the demonstration of its utility, be in the possession of one of the largest fortunes ever possessed by an inventor in recent years, and this I believe, although already some colossal incomes and fortunes have been made from apparently simple ideas put into practical shape. Certainly for lanternists a storage battery of fifty-six pounds weight, or thereabout, that will give, say, eighty volts and ten amperes of current for two or three hours, would be a boon; and the inventor thereof, if such a thing is possible, will be a great benefactor to operators, and hold a higher place in their estimation than the introducers of the compressed oxygen-gas system, that enabled them to dispense with the cumbersome gas bags, pressure boards, and weights of fifteen years ago. The distribution of electrical current is proceeding apace, but there are many towns, suburbs, villages, &c., where even gas is not available, much less electricity; so please hurry up, inventors, and give us bottled-up electricity.

G. R. BAKER.

### RECENT EXPERIMENTS WITH THE LIPPMANN COLOUR PROCESS.

[Translated from Dr. J. M. Eder's *Jahrbuch für Photographie*, 1899.]

THE experiments with Lippmann's Colour Process which the writer commenced in 1894 were continued during the summer of last year, and the following is a short account of the results.

The experiments of the previous year were repeated and fully confirmed.



An abbreviated account of the same was published in the *Jahrbuch* for 1898, and a full description given in a special work upon the subject.\*

In the preparation of gelatine emulsion plates, it was again found that Lautenschlager's gelatine gave the best, or, more correctly speaking, the only usable results. In a series of comparative experiments it was found that the weather had the most important influence upon the quality of the emulsion. In hot, dry (east winds), sultry, tempestuous weather it was impossible to make a satisfactory emulsion. The writer finally prepared the emulsion on cool rainy days only, and was then certain of success.

Although in the past the writer was glad to secure one successful picture on an average from twenty-five mixed colour exposures, by following well-tried rules certainty was so far ensured that, for example, fifteen excellent pictures were obtained from nineteen exposures upon a plate of fruit.

In preparing the emulsion the writer further reduced the temperature to 31°C. in summer and 35°C. in autumn. As this was very little above the setting point of the gelatine, it was, of course, necessary to work as rapidly as possible to secure at least two dozen plates from a batch of emulsion. Re-heating the emulsion is very questionable.

It was found useful to warm all the plates which were to be coated by placing them in an empty metal box (washing tank), under which a small flame was kept burning. The box was closed with a wooden lid, through which a thermometer was thrust to register the temperature, and this was kept at 35° to 40° C. In taking the plates from the box they cool a little, and are then about as warm as the emulsion.

With reference to the mercury, it was found that the chemically pure article obtained from Kahlbaum, of Berlin, kept in purer condition than ordinary mercury.

Occasionally intensification with corrosive sublimate and redevelopment with amidol was of great service. The colours were truer and more brilliant; but the improvement was confined to a few plates only. The same was also found in using Farmer's ferricyanide reducer. It also occasionally happened that mixed-colour exposures were of no use until intensified with corrosive sublimate and amidol and reduced with Farmer's reducer. But it is undesirable to rely upon such a complicated process, which also involves great risks to the image. The constant aim should be to obtain the colours as bright and correct as possible by simple development. Reduction should always be done very slowly with very dilute solutions, otherwise the colours are lost beyond recovery. No satisfactory results were obtained with the new persulphate of ammonium reducer.

As a rule, mixed-colour pictures with gelatine emulsion are less brilliant when viewed through the glass, but the opposite was the case with some emulsions prepared in the ordinary way. The colours, through the glass, were more correct than when looked at through the film, especially with full exposure and the use of much bromide of potassium. It is difficult to account for the anomalous behaviour of isolated emulsions.

With albumen plates, the use of cleared albumen (see Neuhaus, *Farbenphotographie*, p. 5) was found of great value. The writer was therefore induced to abandon the preparation of plates with fresh albumen from hens' eggs. The clearing of egg albumen with ammonia varies considerably in point of time. Albumen five to six months old gives the best results. Cleared albumen will keep for years. From the writer's experience it was found that albumen which did not give good results when fresh, and even when the clearing process was not quite complete, gave excellent results six months later.

Whilst plates prepared with albumen from fresh hens' eggs always become cloudy in the silver bath, the cleared albumen remains perfectly transparent, and the colours are consequently more brilliant. In 1897 the writer found that the film of albumen was liable to blister under alkaline development. The fault was entirely avoided by using plates which had been coated several months. The action of time is very beneficial to the adhesiveness of the film. It is worth noting that albumen plates may be developed without alkali by using a hot solution of pyrogallol, a fact which was brought to our notice by a letter received from Professor G. Lippmann (Paris). This is important where there is a tendency to frilling, because the latter is favoured by the use of alkalies.

To simplify the albumen process, by omitting the colour-sensitising after the silver bath, we tried the addition of the dye to the albumen. Erythrosine is easily soluble in albumen, but cyanine behaves otherwise. If, however, the alcoholic solution of cyanine (1 to 500) is diluted with an equal quantity of water, it may be added drop by drop to cleared

albumen, until the latter is of a deep blue colour, without risk of coagulation. A plain alcoholic solution of cyanine, without the addition of water, would bring about coagulation. But albumen thus sensitised for colour before the silver bath acts differently. Although the action is good in the green, there is insufficient sensitiveness to red, because the cyanine is altered in the acid silver bath.

With reference to the keeping qualities of albumen plates, which have been sensitised in the silver bath and afterwards in the colour bath, a plate which had been so prepared and kept ten months gave an excellent colour picture with very slight tendency to fog. This is of importance from the commercial aspect, if the plates should become a manufactured article.

To dispense with the use of fresh hens' eggs, which are sometimes difficult to get, the writer made experiments with dried albumen. But of all the various sorts only one was found of any use, namely, an American product (albumen *ex ovis crystallis. puriss.*), which was obtained from Simon, chemist, Berlin. This dissolves in water with scarcely any residue. As fresh hens' eggs contain eighty-six per cent. of water, 14 grammes of the dried albumen should be dissolved in 86 grammes of water. But plates thus prepared gave very unsatisfactory colours. Moreover, it is impossible to clear this kind of albumen. The solution goes bad after some time, without having become clear.

Animal albumen cannot be used for emulsions, as it coagulates as soon as it is brought into contact with silver nitrate. It would be advantageous to colour photography if an emulsion process could be worked out with albumen, as this vehicle gives such favourable results, at least with the spectrum. The inconvenience of the silver and the colour-sensitising baths would then be avoided. As the Vienna firm, Lilienfeld & Co., has recently placed albumen papers on the market, which, according to the inventor, are prepared with an emulsion of vegetable albumen, the writer applied to them and inquired if they would place a sample of the emulsion at his disposal to enable him to make some colour experiments. The promise which they very kindly made to send him some, for some unknown reason, has not, however, been kept.

During the past year the writer has again found it impossible to obtain a useful rendering of mixed colours upon albumen plates, notwithstanding the most varied experiments. Their appearance is always such that the correct colours seem to be lower in the film and toned with surface colours. We diligently followed up our experiments of the previous year for the removal of the surface of the film by chemical means (reduction with ferricyanide, &c.), and thus lay bare the colours beneath. But this was attended with complete success in one instance only. This plate was intensified with corrosive sublimate and amidol, and then reduced with ferricyanide and hyposulphite. However, the exception points to the fact that we were on the right road.

Unfortunately, there are too few who have taken up the Lippmann process, although it is the only one which as yet deserves the name of photography in natural colours. Yet the difficulties are much less than they appear. Most of the failures which beginners meet with may be traced to the fact that from want of experience they are not quick enough in preparing the emulsion. This gives it the chance to ripen, and the colour-rendering becomes defective. If beginners would only give themselves the trouble to prepare two or three emulsions, and thus obtain sufficient dexterity of manipulation, they would be rewarded with excellent colours from their subsequent emulsions. Instead of this a few hasty experiments are made with two or three plates, and if these fail the process, of course, is blamed. As in other matters, a little patience and perseverance are necessary to success. Briefly stated, the writer last summer exposed 281 plates, 9 x 12 cm., in the mercury dark slide, although numerous other inquiries prevented him from working at the Lippmann process excepting as a secondary study. One hundred and seventy-five mixed colour and 321 spectrum exposures were made upon these plates; but for the latter one plate was, of course, sufficient for more than one exposure.

In conclusion, we desire to express our warmest thanks to Professor Gabriel Lippmann, of Paris, the genial inventor of the colour process bearing his name, for the great encouragement he has given us during the past summer.

Dr. R. NEUHAUS.

#### THE WAVE THEORY OF LIGHT: ITS INFLUENCE ON MODERN PHYSICS.

[Abstract of Rede Lecture: Reprinted from *Nature*.]

OPTICS are really a modern science. The ancient philosophers had no idea of the complexity of what is vulgarly called light; they confounded in the same name what is proper to man and what is exterior. They had, however, perceived one of the characteristic properties of the link which exists between the source of light and the eye, which receives the

\* Dr. R. Neuhaus, *Die Farbenphotographie nach Lippmann's Verfahren*. W. Knapp, Halle a/S. On p. 24 there is an unfortunate mistake. In the formula for the emulsion, Solution III. should read: bromide of potassium 1.25 grammes; instead of 1.5 grammes.



impression, "Light moves in a straight line." Common experience had revealed this axiom through the observation of the shining trains that the sun throws across the skies, piercing misty clouds, or penetrating into some dark space. Hence arises two empirical notions—the definition of the ray of light, and that of the straight line. The one became the basis of optics, the other that of geometry.

Very little remains to us of the ancient books upon optics. Yet we are aware that they knew the reflection of the luminous rays on polished surfaces, and the geometrical explanation of the images formed by mirrors.

We must wait many centuries until the scientific revival for a new progress in optics (but then a very considerable one) opens the new era; it is the invention of the telescope.

The new era begins with Galileo, Boyle, and Descartes, the founders of experimental philosophy. All devote their life to meditations on light, colours, and forces. Galileo lays the base of mechanics, and with the refracting telescope that of astro-physics. Boyle improves experimentation. As to Descartes, he embraces with his penetrating mind the whole of natural philosophy; he throws away the occult causes admitted by the scholastic, and proclaims as a principle that all phenomena are governed by the laws of mechanics. In his system of the universe, light plays a prominent part; \* it is produced by the waves excited in the subtle matter which, according to his view, pervades space. This subtle matter (which represents what we call to-day the ether) is considered by him as formed of particles in immediate contact; it constitutes thus at the same time the vehicle of the forces existing between the material bodies which are plunged in it. We recognise the famous "vortices of Descartes," sometimes admired, sometimes baffled during the last centuries, but to which skilful contemporaneous physicists have rendered the importance they deserve.

Whatever may be the opinions granted to the exactness of the deductions of this great philosopher, we must be struck by the boldness with which he proclaims the connexion of the great chemical problems, and foretells the solutions which actual generations did not yet entirely accept but drew insensibly to.

In Descartes' view the mechanism of light and that of gravitation are inseparable; the seat of corresponding phenomena is this subtle matter which pervades the universe, and their propagation is performed by waves around the acting centres.

This conception of the nature of light shocked the opinions in vogue; it raised strong opposition. Since the oldest times it was the habit to imagine the luminous ray as the trajectory of rapid projectiles thrown by the radiant source. Their shock on the nerves of the eye produces vision; their resistance or changes of speed, reflection or refraction. The Cartesian theory had, however, some seductive aspects which brought defenders. The waves excited on the surface of still water offer so clear an image of a propagated motion around a disturbing centre! On the other hand, do not the sonorous impressions reach our ear by waves? Our mind feels yet a real satisfaction in thinking that our most sharp and delicate organs are both impressed by a mechanism of the same nature.

Yet a serious difference arose. Sound does not necessarily travel in straight lines as light does. It travels round any object opposed to it, and will follow the most circuitous routes with scarcely any loss of strength. Physicists were thus divided into two camps. In one the partisans of emission, in the other those of the wave theory, each system boasting itself superior, and indeed each being so in certain respects. Other phenomena had to be examined in order to decide between them.

The chance of discovery brought to view several phenomena which ought to have decided in favour of wave theory, as was proved a century later; but the simplest truth does not prevail without long endeavour.

A strange compromise was effected between the two systems, helped on by a name great among the greatest, and for a century the theory of emission triumphed.

The tale is a strange one. In 1661 a young scholar, full of eagerness and penetration, enters Trinity College, Cambridge; his name is Isaac Newton. He has already in his village read Kepler's *Optics*. Almost immediately, and while following Barrow's lectures upon optics, he studies the geometry of Descartes with passionate care; with his savings he buys a prism, that he might examine the properties of colour and meditate deeply on the causes of gravitation. Eight years later his masters think him worthy to succeed Barrow in the Lucasian Professorship, and in his turn he also teaches optics. The pupil soon becomes greater than his teacher, and he gives out this great result: White light which seemed

the type of pure light is not homogeneous; it consists of rays of different refrangibility, and he demonstrates it by the celebrated experiment of the solar spectrum, in which a ray of white light is decomposed into a series of coloured rays like a rainbow; each shade of the colour is simple, for the prism does not decompose the shade. This is the origin of the spectral analysis. This analysis of white light brought Newton to explain the colours of the thin plates which are, for instance, observed in soap bubbles. The fundamental experiment, that of Newton's rings is one of the most instructive in optics, while the laws that govern it are of admirable simplicity.

The theory was expounded in a discourse addressed to the Royal Society with the title, "A New Hypothesis concerning Light and Colour."

This discourse called forth from Hooke a sharp complaint. Hooke also had already examined the colour of thin plates, and endeavoured to explain them in the wave system. He had the merit, which Newton himself readily granted, to substitute for the progressive wave of Descartes a vibrating one—a new and extremely important notion. He had even noticed the part of the two reflecting surfaces of the thin plate, and the mutual action of the reflected waves. Consequently Hooke should have been the very forerunner of the modern theory if he had had, as Newton, the clear intelligence of the simple rays. But his vague reasoning to explain the colours takes away all demonstrative value from his theory.

Newton is very affected by this complaint of priority, and combats the arguments of his adversary by remarking that the wave theory is inadmissible because it does not explain the existence of the luminous ray and of the shadows. He denies the opinion that he has raised a theory; he certifies that he does not admit either the wave hypothesis or the emission, but he says "he shall sometimes, to avoid circumlocution and to represent it conveniently, speak of it as if he assumed it and propounded it to be believed." And really, in the Proposition XL (second book of his *Optics*), which constitutes what was since called the theory of fits, Newton remains absolutely on the ground of facts. He says simply, the phenomena of thin plates prove that the luminous ray is put alternatively in a certain state of fit of easy reflection and of easy transmission. He adds, however, that, if an explanation of these alternative states is required, they can be attributed to the vibrations excited by the shock of the corpuscles, and propagated under the form of a wave in ether.

After all, notwithstanding his desire to remain on the firm ground of facts, Newton cannot help trying a rational explanation. He has too carefully read the writings of Descartes not to be heartily, as Huygens, a partisan of the universal mechanism and not to wish secretly to find in the pure undulations the explanation of the beautiful phenomena he has reduced to such simple laws. But his third book on *Optics* more especially proves his Cartesian aspirations, and, above all, his perplexity. His famous "Queries" expose so forcibly his argument in favour of the wave theory of light that Thos. Young will later cite them as proof of the final conversion of Newton to the wave theory. Newton would certainly have yielded to this secret inclination had the inflexible logic of his mind allowed him to do so; but, when after enumerating the arguments the wave theory of light offers in explanation of the intimate nature of light, when he arrived at the last "queries," he stops, as if seized by a sudden remorse and throws it away. And the sole argument is that he does not see the possibility of explaining the rectilinear transmission of light. Viewed from this standpoint the third book of *Optics* is no longer only an impartial discussion of opposite systems; it appears as the painting of the suffering of a mighty genius, worried by doubt, now led away by the seductive suggestions of his imagination, now recalled by the imperious requirements of logic. It is a drama: the everlasting struggle between love and duty; and duty won.

Such, I take it, is the inner genesis of the theory of fits—a strange mingling of two opposite systems. It was much admired, presented, as it was, by the great mathematician, who had the glory of submitting the motion of all celestial bodies to the one law of universal gravitation.

To-day this theory is abandoned; it is condemned by the *experimentum crucis* of Arago, realised by Fizeau and Foucault. One ought, however, to acknowledge that it has constituted a real progress by the precise and new notions which it contains. The ray of light, considered up till then, was simply the trajectory of a particle in rectilinear motion; the ray of light, such as Newton described it, possesses a regular periodic structure, and the period or interval of fits characterises the colour of the ray. This is an important result. It only requires a more suitable interpretation to transform the luminous ray into a vibratory wave; but we had to wait a century, and Dr. Thomas Young, in 1801, had the honour of discovering it.

\* Le Monde de M. Descartes, ou le Traité de la Lumière (Paris, 1664).



Resuming the study of thin plates, Thomas Young shows that everything is explained with extreme simplicity, if it be supposed that the homogeneous luminous ray is analogous to the sonorous wave produced by a musical sound; that the vibrations of ether ought to compose—that is to say, to interfere—according to the expression that he proposes as to their mutual actions.

Although Young had taken the clever precaution of supporting his views by the authority of Newton,\* the hypothesis found no favour; his principle of interference led to this singular result, that light added to light could, in certain cases produce darkness, a paradoxical result contradicted by daily experience. The only verification that Young brought forward was the existence of dark rings in Newton's experiment, darkness due, according to him, to the interference of waves reflected on the two faces of the plate. But, as the Newtonian theory interpreted the fact in a different manner, the proof remained doubtful; an *experimentum crucis* was wanting. Young did not have the good success to obtain it.

The theory of waves relapsed then once more into the obscurity of controversy, and the terrible argument of the rectilinear propagation was raised afresh against it. The most skilled geometers of the period—Laplace, Biot, Poisson—naturally leaned to the Newtonian opinion; Laplace, in particular, the celebrated author of the *Mécanique Céleste*, had even taken the offensive. He was going to attack the theory of waves in its most strongly fortified intrenchments, which had been raised by the illustrious Huygens.

Huygens, indeed, in his *Traité de la Lumière*, had resolved a problem before which the theory of emission had remained mute; that is to say, the explanation of the double refraction of Iceland spar: the wave theory (on the contrary) reduced to the simplest geometrical construction the path of the two rays, ordinary and extraordinary; experiment confirmed the results in every point. Laplace succeeded in his turn (with the help of hypotheses of the constitution of luminous particles) to explain the path of these strange rays. The victory of the theory of particles then appeared complete; a new phenomenon arrived also appropriately to render it striking.

Malus discovered that a common ray of light, reflected under a certain angle, acquired unsymmetrical properties similar to those rays from a crystal of Iceland spar. He explained this phenomenon by an orientation of the luminous molecule, and, consequently, named this light *polarised light*. This was a new success for emission.

The triumph was not of long duration. In 1816, a young engineer, scarcely out of the École Polytechnique, Augustin Fresnel, confided to Arago his doubts on the theory then in favour, and pointed out to him the experiments which tended to overthrow it.

Supporting himself on the ideas of Huygens, he attacked the formidable question of rays and shadows, and had resolved it; all the phenomena of diffraction were reduced to an analytical problem, and observations verified calculation marvellously. He had, without knowing it, rediscovered Young's reasonings, as well as the principle of interference; but, more fortunate than he, he brought the *experimentum crucis*—the two-mirror experiment; there, two rays, issuing from the same source, free from any disturbance, produced, when they met, sometimes light, sometimes darkness. The illustrious Young was the first to applaud the success of his young rival, and showed him a kindness which never changed.

Thus, thanks to the use of two-mirror experiment, the theory of Dr. Young (that is to say, the complete analogy of the luminous ray and the sound wave) is firmly established.

Moreover, Fresnel's theory of diffraction shows the cause of their dissimilarity; light is propagated in straight lines because the luminous waves are extremely small. On the contrary, sound is diffused because the lengths of the sonorous waves are relatively very great.

Thus vanished the terrible objection which had so much tormented the mind of great Newton.

But there remained still to explain another essential difference between the luminous wave and the sonorous wave; the latter undergoes no polarisation. Why is the luminous wave polarised?

The answer to this question appeared so difficult that Young declared he would renounce seeking it. Fresnel worked more than five years to discover it; the answer is as simple as unexpected. The sound wave cannot be polarised because the vibrations are longitudinal; light, on the other hand, can be polarised because the vibrations are transverse, that is to say, perpendicular to the luminous ray.

Henceforth the nature of light is completely established, all the

phenomena presented as objections to the undulatory theory are explained with marvellous facility, even down to the smallest details.

I would fain have traced by what an admirable suite of experiment and reasoning Fresnel arrived at this discovery, one of the most important of modern science; but time presses.

It has sufficed me to explain how very great the difficulties were which he had to overcome in order to establish it.

I hasten to point out its consequences.

You saw, at starting, the purely physiological reasons which make the study of light the necessary centre of information gathered by human intelligence. You judge now, by the march of this long development of optical theories, what preoccupations it has always caused to powerful minds interested in natural forces. Indeed, all the phenomena which pass before our eyes involve a transmission to a distance of force or movement; let the distance be infinitely great, as in celestial space, or infinitely small, as in molecular intervals, the mystery is the same. But light is the agent which brings us the movement of luminous bodies; to fathom the mechanism of this transmission is to fathom that of all others, and Descartes had the admirable intuition of this when he comprehended all these problems in a single mechanical conception: here is the secret bond which has always attracted the physicists and geometers towards the study of light. Looked at from this point of view, the history of optics acquires a considerable philosophical importance; it becomes the history of the successive progress of our knowledge on the means that nature employs to transmit movement and force to a distance.

The first idea which came to the mind of man (in the savage state) to exercise his force beyond his reach is the throwing of a stone, of an arrow, or of some projectile; this is the germ of the theory of emission. This theory corresponds to a philosophical system, which assumes an empty space in which the projectile moves freely. At a more advanced degree of culture, man, having become a physicist, has had the more delicate idea of the transmission of movement by waves, suggested at first by the study of waves, afterwards by that of sound.

This second way supposes, on the other hand, that space is a plenum; there is no longer here transport of matter; particles oscillate in the direction of propagation, and it is by compression or rarefaction of a continuous elastic medium that movement and force are transmitted. Such has been the origin of the theory of luminous waves; under this form it could only represent a part of the phenomena; it was, therefore, insufficient.

But geometers and physicists before Fresnel did not know of any other undulatory mechanism in a continuous medium.

The great discovery of Fresnel has been to reveal a third mode of transmission quite as natural as the preceding one, but which offers an incomparable richness of resources. These are the waves of transverse vibrations excited in an incompressible continuous medium, those which explain all the properties of light.

In this undulatory mode the displacement of particles brings into play an elasticity of a special kind; this is the relative slipping of strata concentric to the disturbance which transmits the movement and the effort. The character of these waves is to impose on the medium no variation of density as in the system of Descartes. The richness of resource mentioned above depends upon the fact that the form of the transverse vibration remains indeterminate, and thus confers on waves an infinite variety of different properties.

The rectilinear, circular, and elliptical forms characterise precisely the polarisations, so unexpected, which Fresnel discovered, and by the aid of which he has so admirably explained the beautiful phenomena of Arago produced by crystallised plates.

The possible existence of waves, which are propagated without change of density, has profoundly modified the mathematical theory of elasticity. Geometers found again, in their equations, waves having transverse vibrations which were unknown to them; they learnt, besides, from Fresnel, the most general constitution of elastic media, of which they had not dreamt.

It is in his admirable memoir on double refraction that this great physicist set forth the idea that in crystals the elasticity of the ether ought to vary with the direction, an unexpected condition and one of extreme importance, which has transformed the fundamental bases of molecular mechanics; the works of Cauchy and Green are the striking proofs of it. From this principle Fresnel concluded the most general form of the surface of the luminous wave in crystals, and found (as a particular case) the sphere and ellipsoid that Huygens had assigned to the Iceland spar crystal. This new discovery excited universal admira-

\* The Bakerian Lecture, "On the Theory of Light and Colours." By Thomas Young. Phil. Trans. of the R.S. for the year 1802.



tion amongst physicists and geometers; when Arago came to expound it before the Académie des Sciences, Laplace, who had been such a long time hostile, declared himself convinced. Two years later Fresnel, unanimously elected a member of the Academy, was elected with the same unanimity foreign member of the Royal Society of London; Young himself transmitted to him the announcement of this distinction, with personal testimony of his sincere admiration.

The definite foundation of the undulatory theory imposes the necessity of admitting the existence of an elastic medium to transmit the luminous movement. But does not all transmission to a distance of movement or of force imply the same condition? To Faraday is due the honour of having, like a true disciple of Descartes and Leibnitz, proclaimed this principle, and of having resolutely attributed to reactions of surrounding media the apparent action at a distance of electrical and magnetic systems. Faraday was recompensed for his boldness by the discovery of induction.

And, since induction acts even across a space void of ponderable matter, one is forced to admit that the active medium is precisely that which transmits the luminous waves, the ether.

The transmission of a movement by an elastic medium cannot be instantaneous; if it is truly luminous ether that is the transmitting medium, ought not the induction to be propagated with the velocity of luminous waves?

The verification was difficult. Von Helmholtz, who tried the direct measurement of this velocity, found, as Galileo formerly, for the velocity of light a value practically infinite.

But the attention of physicists was attracted by a singular numerical coincidence. The relation between the unity of electrostatic quantity to the electro-magnetic unit is represented by a number precisely equal to the velocity of light.

The illustrious Clerk-Maxwell, following the ideas of Faraday, did not hesitate to see in the relationship the indirect measure of the velocity of induction, and by a series of remarkable deductions he built up this celebrated electro-magnetic theory of light, which identifies in one mechanism three groups of phenomena completely distinct in appearance, light, electricity, and magnetism.

But the abstract theories of natural phenomena are nothing without the control of experiment.

The theory of Maxwell was submitted to proof, and the success surpassed all expectation. The results are too recent and too well known, especially here, for it to be necessary to insist upon them.

A young German physicist, Henry Herz, prematurely lost to science, starting from the beautiful analysis of oscillatory discharges of Von Helmholtz and Lord Kelvin, so perfectly produced electric and electro-magnetic waves, that these waves possess all the properties of luminous waves; the only distinguishing peculiarity is that their vibrations are less rapid than those of light.

It follows that one can reproduce with electric discharges the most delicate experiments of modern optics—reflection, refraction, diffraction, rectilinear, circular, elliptic polarisation, &c. But I must stop, gentlemen. I feel that I have assumed too weighty a task in endeavouring to enumerate the whole wealth which waves of transverse vibrations have to-day placed in our hands.

I said at the beginning that optics appeared to me to be the directing science in modern physics.

If any doubt can have arisen in your minds, I trust this impression has been effaced to give place to a sentiment of surprise and admiration in seeing all that the study of light has brought of new ideas on the mechanism of the forces of nature.

It has insensibly restored the Cartesian conception of a single medium refilling space, the seat of electrical, magnetic and luminous phenomena; it allows us to foresee that this medium is the depository of the energy spread throughout the material world, the necessary vehicle of every force, the origin even of universal gravitation.

Such is the work accomplished by optics; it is perhaps the greatest thing of the century!

The study of the properties of waves, viewed in every aspect, is therefore, at the present moment, the most fertile study.

It is that which has been followed in the double capacity of geometer and physicist by Sir George Stokes, to whom we are about to pay so touching and deserved a homage. All his beautiful researches, both in hydrodynamics, as well as in theoretical and practical optics, relate precisely to those transformations which various media impose on waves which traverse them.

In the many phenomena which he has discovered or analysed, movements of fluids, diffraction, interference, fluorescence, Röntgen rays, the

dominant idea, which I pointed out to you, is always visible; it is that which makes the harmonious unity of the scientific life of Sir George Stokes.

The University of Cambridge may be proud of the Lucasian Chair of Mathematical Physics, because, from Sir Isaac Newton up to Sir George Stokes, it has contributed a glorious part towards the progress of Natural Philosophy!

A. CORNU.

#### CALCIUM CARBIDE AND ACETYLENE.

The Meran Carbide Works have succeeded in manufacturing carbide on a commercial scale of higher quality than the usually accepted standard of 300 litres of gas per kilo of carbide. Guidé, of the Ecole de Physique et de Chimie de la Ville de Paris, reports that the carbide from this factory gives the following results upon analysis:—

##### PHYSICAL CONSTANTS.

Density .....	2.22
Good crystalline quality.	
Crystals, large, of chocolate or steel-blue colour, with metallic, red-brown lustre.	

##### CHEMICAL COMPOSITION.

Calcium carbide .....	94.2 per cent.
Calcium .....	0.9 "
Carbon .....	0.6 "
Carbonate of silicon .....	2.8 "
Undetermined .....	1.5 "

100 per cent.

Gas generated per kilo..... 332 litres.

##### ANALYSIS OF THE GAS GENERATED.

Acetylene .....	99.508
Methane .....	0.040
Hydrogen .....	0.064
Carbonic oxide .....	0.084
Nitrogen .....	0.230
Ammonia .....	0.032
Sulphuretted hydrogen.....	0.018
Hydrogen phosphide.....	0.006
Silicon hydride.....	no definite traces
Not analysed .....	0.018

100—

The monthly circular of the Carbide and Acetylene Association, Berlin, states that the prices of carbide have fallen all round. Carbide may be bought, in Berlin, at 43s. to 47s. per 100 kilos, including packing. The wholesale price, free in Hamburg or Bâle, is 32s. to 35s., or 37s. 6d. to 40s. for small parcels.

#### A NEW MICROSCOPE LAMP.

It may be of interest to those who practise photo-micrography to learn that a new lamp will shortly be placed upon the market by Ed. Weaster, of Berlin. The *Archiv für Wissenschaftliche Photographie* describes it as a ring-shaped incandescent electric lamp, which can be attached to the tube of the microscope concentrically. A screw attachment is provided for adjusting the distance, and an annular shade with parabolic mirror concentrates the light upon the object. The great advantage of this apparatus is uniform and intense illumination.

#### DISSOLVING EFFECTS WITH SINGLE LANTERNS.

The dissolving of views by means of the optical lantern dates back from the year 1811, when H. Langdon Childe created no small sensation by publicly exhibiting them for the first time; and it was not until about the year 1837 that Mr. Dancer, of Manchester, first practically introduced the projection of views by means of the limelight, as well as substituting photographic transparencies for the hand-painted pictures, which up to that time had been employed in all magic lanterns.

The dissolving of one view into another was then effected by means of two lanterns, although it would appear that for some time Childe kept the secret to himself, and, notwithstanding that thousands of attempts have been made during the last fifty years to produce an equally satisfactory effect by means of single lanterns, it cannot be said that, up to



the present day, any single lantern or carrier has been produced that yields the same delightful effects as were obtained in early years by means of cutting off the light from one lantern whilst at the same moment that from another lamp was made to fall upon the screen.

The means at first employed by Childe were practically the same as we see in use at the present day, when oil lamps are used as the radiant, viz., by passing a metal comb across the front of the objectives, whereby the light from one lamp is made to blend one picture into another without any seeming increase or decrease of illumination on the screen, and later on, after the limelight had been fairly established as the light of the future in projection work, the single-plug dissolver, invented by Mr. Noton, and of which the first description was made public by *THE BRITISH JOURNAL OF PHOTOGRAPHY*, in March 1864, may be said to have solved the problem, in so far as two or more lamps are concerned, for all time coming.

To attempt to enumerate a tithe of the methods that have been suggested during the last fifty years for the obtaining of dissolving effects by means of single lanterns and carriers would indeed be a task of no light order; for both in this country, as well as on the Continent and the United States of America, attempts after attempts have been made, and no doubt in some instances extremely clever pieces of mechanism have been devised; but they all come short of the beauty shown by cutting off the gas, or light, from one lantern whilst that from the other is being introduced, and hence, in any high-class lantern entertainment in which dissolving views form a part, it is necessary to employ a double or triple decker.

With the introduction of photographic transparencies however, in lieu of the old-fashioned hand painted slides, there came a gradual falling off in the popularity of the old double and triple deckers, and single lanterns, by reason of their suitability for illustrating lectures, as well as for educational purposes, have for a great part taken their place, and hence the amount of thought bestowed upon the improvements of the older forms of carriers used in single lanterns, the fruits of which we see in several of the admirable pieces of mechanism that now form part of a first-class single lantern outfit.

Among those who have done much to popularise the single lantern within recent years may be mentioned the names of W. J. Chadwick, Mr. Lancaster, Mr. Beard, Mr. Tyler, Mr. Hughes, and a host of others, among whom are many amateur mechanics, notably Mr. Alexander Robb, of Gourcock, who some years ago not only designed but personally made a form of carrier for his single lantern, which has, perhaps, come as near as possible yielding an effect similar to the cut-off method when mechanical dissolvers are employed, but which, from some reason or other, has never been seen in public use.

In lantern projection it is a well-recognised rule that the screen ought never to be shown without a picture on it, the reason for this, no doubt, being due partly to the fact that any view following an absolutely white disc of dazzling brightness is certain to lose in brilliancy, more or less, when at first it comes before an audience; and, acting on these lines, carriers have been designed which momentarily cut off the light entirely whilst a slide is being changed, and with some this form of carrier is much appreciated. On the other hand, there are those in which the light is not cut off to any extent, but in which the coming slide is made to pass rapidly in front of and over the face of the slide that has been shown upon the screen, the distance in front of which the entering slide is made to run yielding a slight out-of-focus effect that resembles to a certain extent the effects produced by cutting off the light from one lamp whilst that from another is being admitted. Among these forms of carriers may be mentioned that of Mr. Beard, which, although somewhat costly, works smoothly and is very effective.

In Mr. Robb's design, which only very few in this country have seen, the effect is produced in an entirely different manner. Mr. Robb, taking as his model that of the iris diaphragm, applies a small hood to the front of the objective, in which is contained a number of semi-transparent segments, that are caused to open and close just like an iris diaphragm movement. These segments are actuated by the same movement of the carrier which pushes home and withdraws the slides, the movement being communicated to the diaphragm by means of a nicely adjusted lever and little chains attached to the diaphragm in front of the lens. In the hands of Mr. Robb this carrier works beautifully, and it is a pity it is not better known and more in use.

In Mr. Beard's carrier, where one slide is introduced and made to pass in front of the one being shown, there are many extremely good points, and there is no doubt it marks a distinct advance in single-lantern working. Personally, the writer has used this form of carrier since its introduction, and it has given unbounded satisfaction, even among those who claim to know everything about lantern projection. In using this carrier, however, much improvement may be effected by a simple alteration in the slides, which any one can perform who is making up a special set of transparencies for lecture purposes.

The only drawback to this form of carrier (if, indeed, it can be deemed a drawback affecting the carrier) lies in the appearance of the dark bands which cross the slide when a new one is being introduced across the face of the one in the lamp. Of course, this dark streak or band is caused by the opacity of the mask and binding at the edge of the slide that is being inserted. For a time, when using this carrier, I tried to overcome this

appearance by attaching a semi-transparent screen, that was actuated by the same movement that inserted and withdrew the slides; but I never could get my arrangement to work as sweetly as the carrier would do without any attachments, and so one night I put on my thinking cap, determined to solve the problem, and, after a little thought, I managed it thus:—The opaque bar was caused by the binding and mask of the slide, and it struck me all of a heap to make up my lecture sets without any masks, and to bind the cover glasses to the slides at the top and bottom only, and, in some cases, at the corners. This at once got over the difficulty; but, in order to show all the slides in the set as if bound up in the same shape of mask, I got a series of thin brass diaphragms cut out in varying shapes, rounds and cushions, &c., and of different sizes, from 2½ to 2½-inch apertures, and by attaching one of these metal plates to the back of the carrier every slide was made to register exactly, and appear the same size and shape of mask, as well as yielding as nearly as possible a dissolving effect as any single lantern can be made to give.

In adopting a carrier of this description it has been urged that such can only be used from one side of the lantern. This is quite a mistake. Bard's carrier can be used either right or left, and in this lies one of its advantages. If the lantern has to be tilted upwards, as is often the case when working from the floor of a hall on to the screen erected on a platform, the best position is certainly to work from the right of lamp; simply because, owing to the construction of the guides of the carrier, the slide of its own accord falls backward in its proper position in the grooves, and the plunger never misses in driving it exactly into position. On the other hand, if the lantern be tilted downwards, as is often necessary when working from a gallery on a screen at a lower elevation, the slide is certainly liable to lean forward in its runner, and, unless an operator is very careful, the plunger may not carry the slide home perfectly; but, with care, any one knowing the working of this carrier, such need never occur. Whenever, however, a strange operator is at the lamp, and the tilting is downward, I have found it safer to reverse the carrier and work from the left of the lantern. By this means the slides are inserted in exactly the same runners, in the same way, only the forcing arms and lever will drive the slide forward instead of back, but the result is quite the same in the lantern, and the carrier will now work tilted up or down in just the same perfect manner.

It has often been claimed that a good carrier is the backbone of a single lantern outfit, and there is much truth in the statement. The old-fashioned go-and-return carrier is, no doubt, sure and simple, but, to my mind, the slides appearing first from one side, then another, never was an elegant way of showing pictures, and where such is shown alongside one of the modern forms of pleasing change carriers (for, truly, dissolving is too much to claim for any single form of lamp) the contrast is very great indeed, and the comfort all in favour of the mechanical carrier.

For lecturing purposes, pure and simple, the single lantern has quite taken the place of binoculars, and, now that the cinematograph has usurped the place of the triple decker, it looks as if the old-fashioned, but highly enjoyable, entertainment of dissolving views will, in a few years, be a thing of the past. Not so, however, in single lantern work when such is practised with first class apparatus in competent hands.

It is often urged that single lanterns fail occasionally, in that the limes give out during a lecture, but in recent years opticians are providing better limes, or, at least, a quality that withstands the high-pressure jets far better than the limes of former years, and a well-preserved lime in the hands of a clever operator will run a whole evening without giving any anxiety in lecture projection, where such extremely high pressure as is found necessary in cinematographic work is not required.

A. T. NEWTON.

#### LIGHTHOUSE ILLUMINANTS.

In a communication to the *Times*, Professor W. F. Barrett, of Kingstown, Dublin, refers to the question whether the old illuminants for lighthouses are not superior to the electric arc. He writes: "The statement made by the President of the Board of Trade, in reply to a question put to him in the House of Commons by Mr. Field, as to the inferiority of the electric light to oil or gas as a lighthouse illuminant in foggy weather, is a matter of no slight public importance. For Mr. Ritchie's answer affirming this inferiority under certain circumstances, just those circumstances when the value of a lighthouse is put to a crucial test, may be taken to indicate that the Elder Brethren of the Trinity House have been impressed by the weight of evidence which has reached them in favour of the older illuminants."

Those of us who have had the opportunity of examining this question from a scientific point of view have long since come to the conclusion that the employment of the electric arc for lighthouse purposes is a serious mistake, and should no longer be continued. In clear weather other lighthouse illuminants are amply sufficient in power, and the electric light is very apt to mislead the sailor as to his distance from the light, whilst in hazy or foggy weather repeated observations, both of mariners and scientific men, have shown the inefficiency of this light, even of the most powerful electric arc in a lighthouse of the first order. This may be due in part to the fact that rays of high refrangibility, such as are emitted by the arc light, are more largely absorbed by a fog than



rays of lower refrangibility, such as are emitted by oil or gas. Another and perhaps more potent cause appears to be in the very condition which gives the arc light its great value for ordinary optical purposes, namely, its concentration in a minute area compared with oil or gas; this would seem to be a positive disadvantage in a lighthouse illuminant in foggy weather. In support of this statement, I would refer to the Parliamentary paper on lighthouse illumination; see especially the "Return on the subject of Lighthouse Illuminants" February 1893.

I may perhaps quote a paragraph from a letter of mine, dated December 1892, which appears in the return I have just referred to. After a series of observations from my house across the Bay of Dublin (a distance of some six miles) upon the performance of the "giant lens" which Mr. Wigham had then introduced for his admirable system of lighthouse illumination, I remarked: "The experiments and observations in which I have taken part in preceding years have convinced me of the unquestionable superiority in fog-penetrating power of a large and brightly illuminated area over an intense point of light or sharply defined beam such as is furnished by the electric light." Subsequent observation and inquiry have confirmed the view I then expressed, and recently, when in the Isle of Wight, a similar opinion was expressed to me by competent observers as to the comparative uselessness in foggy weather of the splendid electric light at St. Catherine's Point. This view is amply supported by the evidence of numbers of practical seamen contained in the Parliamentary paper I have mentioned. Here, for instance, is the opinion of Captain Threlfall Bragg, R.N.R., the well-known nautical assessor of Liverpool, who, referring to the very Lizard lights with respect to which Mr. Field put his question in the House, says:—

"When I was in command of the steamship *Anterior*, bound round from London to Liverpool, at night, a short distance off Lizard Point, a fog came on; as we approached the point we heard the sound of the Lizard fog siren. The two lights on the Lizard are powerful electric lights, which we were anxiously on the look-out for, but we were unable to see them, as they were completely obscured by the fog siren, and only passing at a safe distance outside the dangers lying off the point."

Several new lighthouses are, I believe, in course of erection around our coasts, and it is earnestly to be hoped that the lighthouse authorities will take steps to place in these lighthouses the illuminant which experience has proved to be of the greatest service to the mariner. For my own part, and speaking as an unofficial and independent observer, I entirely agree with the opinion of the former distinguished scientific adviser to the Trinity House, Professor Tyndall, that, so far, the multi-form gaslight, with which the name of Mr. Wigham has so long been associated, has not been superseded as a lighthouse illuminant.

#### BALLOONING AND PHOTOGRAPHY.

MR. PERCIVAL SPENCER, aeronaut, and Mr. Pollock left the Crystal Palace by balloon on Saturday afternoon, July 29, with the intention of crossing the English Channel. A favourable N.W. wind was blowing at the time of the start, and the journey was accomplished with complete success. Mr. Spencer supplied the following narrative of the voyage to the *Daily Telegraph*:—

"At 2.30 we left the Crystal Palace, and were moving over Penge, Bromley, Beckenham, Bickley, and other picturesque suburbs. I carried a Frena camera, with forty photographic films, which I proceeded to expose. Now commenced a voyage over agricultural land, with distant views of heath, villages, and undulating ground, rendered flat and chess-board-like by the altitude we had reached. Distant gunshots were heard—sportsmen's shots at rabbits, perhaps, yet the stillness and tranquillity usual to a balloon voyage pervaded all. On looking ahead, we were glad to perceive that we were making almost direct for Knockholt Beeches, which form a landmark direct south-east from the Crystal Palace, and therefore on the direct route across Channel. For an hour we travelled thus, and at 3.30 p.m. we had reached Sevenoaks.

"The balloon rose to an altitude of 5000 feet, indicated by the aneroid barometer. Then Tonbridge and Tonbridge Wells were crossed. Our altitude we maintained for some time, the heat of the sun's rays causing the gas in the balloon to become rarefied, whilst the masses of cloud below kept the air in the lower strata cool, and prevented the balloon descending into them. As the sun shone on these clouds, the effects were various, beautiful, weird, and always wonderful. Perhaps the prettiest sight was when the balloon, rising from the rolling billowy mass, left a shadow sharply silhouetted on the clouds, and surrounded by a ring of rainbow-coloured tints.

"Until 4.30 the coast line was shut out from our view, and then through the clouds a distant white line marked the termination of the land, perhaps fifteen miles ahead. Between 4.30 and 5 o'clock we had to decide the important question of whether a descent should be made in England, or whether we should attempt to cross the sea. The balloon continued to maintain its altitude, and we noted, by fixing our gaze upon the earth and consulting a pocket compass, that the direction was due south-east. It could not be better from a theoretical point of view. We had used four out of the ten bags of sand, each weighing half a hundred-

weight, with which we had provided ourselves before starting. As the coast line came nearer, we observed that we were crossing the twin towns of Hastings and St. Leonards. We then decided not to open the valve and descend, but to continue our journey across.

"At 5.3 p.m. we were passing out to sea, and again I brought the camera into requisition. Looking backwards, to the right lay the coast line to Dungeness, a sandy prominence jutting out into the sea, and beyond the white cliffs to Dover. Immediately behind were the old and new towns of Hastings. Thence the coast line continued past Bexhill to Eastbourne and Beachy Head—the latter prominent, but the towns almost indistinguishable owing to distance and cloud. By 5.20 the clouds had completely shut out the English coast. Then, after rising to 7000 ft., the balloon dropped to 2000 ft., and it required two and a half of our remaining six bags of ballast to get a lift once more into the sunshine. By six o'clock we had risen to 8000 ft. After a consultation we decided not to again permit the balloon to descend into the cold lower air lest we exhausted our sand and found ourselves unable to get the balloon to rise again.

"Looking now over the clouds into clear blue sky, Mr. Pollock was the first to discover the white line of cliffs which marked the boundary wall of France. Far, far away it was, yet this was our destination. By dint of careful and constant discharge of ballast in small quantities, we maintained the equilibrium of the balloon, and increased its altitude to 9000 feet. At this height the vast solitude of the sea was wonderfully impressive. The hum of the waves could no longer be heard. From the direction of the smoke of a large steamer near Hastings we had seen that the wind on the surface of the water was coming from the west, whilst we above were in a north-westerly current. At 7 p.m. we were at a height of 7000 feet, and apparently very little nearer the other side. Our stock of ballast was fast diminishing; in fact, we had only one full bag left, and, in accordance with our decision to maintain the altitude of the balloon, this was being steadily parted with. We gathered together all the empty sand bags (the ten weighing some pounds), prepared to utilise them as ballast when all the sand should have run out. At 7.30 p.m. we were at 10,000 feet, being presumably borne onwards slowly, yet having no certain means of detecting whether we were moving or not.

"We could not observe any ships, but now there was no doubt about the coast line. It was perfectly clear ahead, and we could even distinguish the mouth of the river Somme, with the low-lying coast to the left and the long white range of cliffs to the east. Still, it was quite a debatable question whether we should be able to reach the coast without touching water. We knew that, if we were unable to maintain the altitude, if the balloon once sunk below the level of the clouds, it might commence a rapid downward course which our ballast being gone, we should be powerless to prevent. At 7.35 the last sand ran out. We maintained equilibrium by throwing over first all the empty sand bags, and then the linen wrapper carried to enclose the deflated balloon after the descent. At 7.40 all extraneous weight had been thrown over, and we were sinking.

"Down dropped the balloon—9000 ft., 8000 ft.—and we were at least ten miles from shore. Save for our two selves, the car was empty. I slung the camera up in the rigging, so that it should be kept dry if our car touched the water. Desperate situations require drastic measures. To prevent the balloon from continuing and increasing the force of its downward career, we decided to unship the anchor and drop it into the sea. The seventy pounds of steel, bar and prongs, were cast overboard, and fell with lightning-like rapidity, whirling as it whirled through the air until it reached the desert d sea, thousands of feet below. Thus lightened, the balloon speedily ascended, reaching its maximum height of 12,000 ft. Having attained this height, it resumed perfect equilibrium, but for a few moments only, for, as the sun disappeared behind the bank of evening clouds—a dark fringe on the distant horizon—and deprived us of the benefit of its heat rays, the balloon began to settle slowly yet surely. To say the least of it, it now became very interesting to watch the French coast, and to wonder whether or not the balloon would reach it. By carefully comparing our position with that of the ships below us, we were convinced that we were on our way to the shore; but now—7.50 o'clock—our balloon had dropped to 8000 ft., and was continuing its downward course. Fortunately for us, our fears were not realised. The loss of the sun's rays did not cause so rapid a drop as we had anticipated, and at 7.55, though descending at the rate of 500 ft. per minute, and with no means to prevent the continuance of our downward course, we still cherished every hope of reaching the shore.

"Towns, harbours, country sides, and land could now be distinguished. At 8 o'clock the white chalk cliffs became perpendicular. We could no longer see the surface of the sea. We were over land, and our height was still 5000 feet. In another five minutes we had descended so low that we looked ahead for a landing-place. We were fast approaching earth, with a large wood in front of us. We opened the valve to hasten our descent before reaching it, and at 8.8 our trail rope touched the ground. A moment or so later our car was bumping the ground a bare hundred feet before reaching the trees. The balloon rose slightly, and was carried on by the breeze, but only for a short distance. We held the valve open, and the course of the fast deflating balloon was at last summarily checked by the knot in the trail rope and the friction of the car upon the rough ground.



"The populace, in the form of capped and bloused agriculturists, arrived in due course. We learned we were at Worncourt, one and a half miles inland, about midway between Dieppe and Tréport. A vehicle was provided, in which the balloon, packed in its car, and ourselves were conveyed to the nearest railway station. We booked the balloon for London by *grande vitesse*, and ourselves took train to Tréport, where we passed the night."

### THE PURIFICATION OF ACETYLENE.

The average composition of acetylene obtained by means of carbides of Swiss and of American manufacture is as follows:—

	American. Per cent.	Swiss. Per cent.
Acetylene .....	99.87	99.87
Phosphoretted hydrogen .....	0.04	0.02
Sulphuretted hydrogen .....	0.02	—
Ammonia .....	0.06	0.04

Carbides of recent manufacture give a gas which contains less sulphuretted hydrogen and no trace of silicuretted hydrogen. The quantity of sulphuretted hydrogen is always less when the generator contains a large excess of water. A judicious choice of raw materials enables us to reduce the amount of ammonia and phosphoretted hydrogen to a few hundredths per cent.; but even such small quantities are still of serious inconvenience.

The method of purification proposed by Frank gives good results: it consists in using acid solutions of certain metallic salts, particularly chloride of copper. A part of the acetylene is transformed into aldehyde.

The author proposes the use of chloride of lime containing a small quantity of an alkaline chromate. The free chlorine is thus absorbed and the acetylene does not undergo any decomposition.

Frank states that the acid solution of the metallic salt which he uses can be placed in an enamelled vessel, and that the quantity of aldehyde formed is very small. He claims that one litre of his solution will purify fourteen cubic metres of acetylene, and that it can be regenerated by boiling, followed by aeration.—*Journ. für Gasbeleuchtung*, xli. [42], p. 683.  
P. WOLFF.

### FLASHLIGHT EXPERIENCES.

My dear first, as a widow who has buried several husbands would say, represents an "at home." Not one of the "fash-nable" "society" affairs called by that name, where every one feels the reverse of at home, but my own family and myself at home one Sunday afternoon.

The directions said, "Shield your eyes from the light," so I thought I must; but later experience taught me this was unnecessary. Tell your sitters not to look directly at the flash, and all will be well. There were no outside blinds on the windows, so we drew down the dark brown opaque curtains as close as possible; all took our positions; I drew the slide, uncapped the lens, lit the Scovill cartridge No. 2, and dropped into the chair which had been placed ready. The nearly white wall paper and the nearness of the walls in this room greatly assisted the light, which was ample for a normal development.

My second, you will see, was taken in a large hall, with the light far removed from the subject, and, although twice as much flash powder was used, it is only about half lit. But they ordered about six dollars' worth of them at thirty-five cents each for 8 x 10 prints, so I was well paid for my attempt.

My third is a Thanksgiving-day dinner, where everything happened as planned, except that the fuse on the cartridge was not long enough to admit of my getting into the chair in the right foreground, and you will hardly recognise me in the blur above it.

Don't try to be saving of your powder. Use plenty, heaping up one cartridge with part of the contents of another, till you are sure you have enough.

Don't hold the cartridge in your hand when you light it, it would be sure to burn you. Don't fire your powder close to light draperies, or without a large serving tray, or something equally fireproof, under it.

Don't forget to cap your lens and replace the slide before opening up the room to let out the smoke, or your plate will get "too very much exposed," as I once heard a hopeful amateur say.

E. F. PHILLIPS, in the *Photographic Times*.

### DIFFICULT CLOUDS MADE EASY.

A FREQUENT method of obtaining a general impression of a photographic exhibition is to stand in the centre of the room, or gallery, and to observe what is the predominating feature. Those who during the last year or two have applied this principle, when visiting our leading "Show," will, in all probability, have observed that the majority of the exhibits owe much of their merit and attractiveness to clouds; in fact, without their harmonious skies many of the best pictures would have been unworthy of being "skied" at a travelling peep-show. It is, however, unnecessary

to expatiate upon the advantages of clouds. For the purpose of this article it suffices to accept the hypothesis that they have come and are sure to stay. Also there is no need to more than briefly refer to the usual method of blocking out, or the duster way of inserting clouds, because they are well known and written about in every manual of the most moderate pretensions, so we will proceed quickly. Generally speaking, when our clouds require deeply printing, and we have a number of delicate details appearing above the sky line, even the oldest hand would find the successful carrying out of his desire a difficulty, as the extra degree of density added to the obstructive matter would be at once evident. The following practice will, however, enable anybody to insert any desired effect with easy and certainty.

The procedure is as follows: Take your negative, and make from it a positive, and then select a suitable cloud negative (which should be preferable on celluloid). In a printing frame place the cloud film on the top of the positive, and again, on that, a slow plate of any kind that you are in the habit of using. After fastening up the frame, print by gaslight, using your focussing cloth, or a piece of paper, as a rough mask, and keep it moving in the customary manner, so as to avoid any harshness in the horizon line, and develop in the ordinary way. You now have two positives, one of the subject, and another of the sky, which latter will have blank spaces even where the most delicate tracery of foliage, or anything else, juts out beyond the landscape proper.

Nothing now remains but that the photographer should carefully superimpose the cloud positive upon the picture positive in such a manner that the protruding bits fit exactly into the blanks in the sky positive. This is exceedingly easy to do even by the most inexperienced.

Prior to uniting the two glasses put a few spots of any ordinary mountant on the edges of one of them, so that, when you have got both plates in proper register and placed them on some flat surface, they will dry and adhere sufficiently well to stand any reasonable amount of rough usage.

From this combination it is only necessary to make a negative, which must perforce be done by copying in the camera, seeing the picture is inside the two glasses. This cannot be considered a disadvantage, as any size of negative may naturally be produced, and which will be complete in every sense, and from which any number of prints can be made with an exactness that would be manifestly impossible by any of the ordinary uncertain modes of double printing at present customary.

The idea may not be entirely novel, but, to the best knowledge of the writer, it is not as widely known as it deserves to be. For carbon printing it is an enormous advantage to have one's clouds on the negative, seeing the process is a blind one, and, when working the bromide or any other form of developing process, its utility will be at once admitted.

PERCY SHEARD.

### A VILLAGE LIGHTED BY ACETYLENE.

ST. MICHAEL'S, a village in Kent, within sight of the steeple which is in some roundabout way supposed to be the cause of the Goodwin Sands, has led the way. Tenterden itself is lighted by coal gas, but the company's mains do not reach St. Michael's, and the village has been paying one-sixth of the lighting rate of the borough without reaping any benefit in illumination. The village has had to grin and bear it, for the place is not large enough for ordinary gasworks.

The invention of acetylene gas, however, and the special applicability of Messrs. Thorn & Hoddle's system to large or small requirements, has given the village its opportunity. Half-a-dozen shareholders, with a capital of 150*l.*, have set up an installation capable of supplying continuously eighty burners of twenty-five candle-power each, and the only attention which is required is that of one person for about twenty minutes a day. Included in this 150*l.*, moreover, are the expenses of providing six public lamps and 651 yards of piping. It is calculated that the acetylene gas will come cheaper to the consumer than ordinary coal gas. A lady, by the bye, is the managing director of the little company.

"To many microscopists the terms 'one quarter inch,' or 'one half inch,' as applied to their objectives, convey the idea that, when in focus, the object is at a distance of a quarter inch, or a half inch, from the front lens. They confound the equivalent focal length of the objective with the working distance. As a matter of fact, the latter is always considerably less than the former. The determination of the working distance of an objective is a point of considerable importance, and therefore all microscopists should make themselves familiar with the method of calculating it. The following simple device will be found useful for estimating the working distance of objectives that are not higher than one-twelfth inch. Make a long thin wooden wedge, ten centimetres in length along the base, and twenty millimetres in perpendicular height. Focus a diatom on a glass slip without a glass cover, and then carefully push the wedge along the glass slip until it touches the objective. The thickness of the wedge at the point of contact will represent the working distance of the objective."—M. J. H. COOKE in *Knowledge*.



# MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."

[September 1 1899.]

# THE LANTERN RECORD.

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## LANTERN MEMS.

THE near approach of the lantern season is heralded by the issuing of the publishers' lists of new photographic slides. As Messrs. York & Son are always to the fore, I cannot do better than call attention to their new subjects first. Their sets are invariably comprehensive, and the Continental and other views not only form good pictures, but are useful from an instructional point of view, for many are suitable for the illustrations necessary in teaching physiology, while in the popular educational series is a set of *Shakespeare's Avon, In the Footsteps of Cromwell*, and some half-dozen supplemental maps; also one on *Human Vision*, which includes illustrations specially referring to refraction, chromatic aberration, astigmatism, binocular vision, persistence of vision, and other subjects interesting to photographers and lanternists.

THE general sets deserving of special mention are the following: *Cairo and the Nile, Past and Present; Life and Scenes in Palestine; Jerusalem, Ancient and Modern; The Cities of Berlin and Dresden; Sicily*, and a number of life-model sets, and some forty photographs of *New London*. The illustrated songs which are always popular at entertainments have been added to as follows: *The Lost Chord, The Angels' Promise, Ben Bolt, Coming through the Rye, and The Star of Bethlehem*.

MESSRS. VALENTINE, G. W. Wilson & Son, and West & Son, have each added largely to their lists, and produced sets and series of slides of the well-known character of distinctive work for which each is noted. When one looks at the large catalogues of slides now published, one cannot help contrasting the position of the lantern world with what it was a quarter of a century ago, and adding to this the thousands of slides made from private or amateurs' negatives makes the position of the lantern-slide dealer one that necessitates the possession of an expanding store-room. If the publication goes on at the rate it has done in recent years, premises constructed on the plan of the glass houses in Guernsey would have to be the order of the day, if land were available for the purpose; but, unfortunately, in London and the large cities and towns the only way in which premises can extend is upwards.

I ALWAYS like to hear of successful work in new fields being accomplished, and recently I have had an account given me of an

outdoor lantern exhibition to the fishermen, coastguard, and soldiers in the fishing town of Kinsale, in the south of Ireland. The apparatus was the gift of the Baroness Burdett Coutts, and was all specially arranged for convenience of work at some distance from the place of storage, the whole of it packed away in a covered hand cart that could be drawn down to the quay where the exhibitions were given, places being made in the cart for gas cylinders, screen-support, slides, &c. The exhibitions are given by the local commander of the coastguard, who has been most enthusiastic in the work, and taken great pains to entertain and instruct those who have little opportunity of recreation of an intellectual order. Mr. J. H. Steward, of the Strand, supplied the apparatus and slides, and had the hand cart specially built for the purpose. It bears a plate, stating that the apparatus is in charge of the commander of the coastguard for the time being, and held, under certain conditions, for the benefit of sailors, fishermen, and soldiers, as mentioned above.

It is quite refreshing to come into business contact with those that follow the sea as a profession, and especially officers in Her Majesty's Navy, for there is a certain charm in the "breeziness" of their manner that carries all before it. Besides having a practical grasp of most scientific subjects, a knowledge of mechanics and fearlessness of anything dangerous, it is quite amusing to hear "one of the Queen's naves" talk, but I was just a wee bit staggered with the remark, "I suppose I can learn all about the lime light in five minutes." "Well, hardly," I replied, "suppose we say a quarter of an hour," and it was done.

I MENTION this, that would-be users of the lime light may understand that, given simple and efficient apparatus, a limelight lantern, even of the high-pressure-mixed-gasjet order, is not such a fearful and wonderful thing but that the operation of it is such that any one of average intelligence can quickly master it, if—and this is a big if—it is followed up by a lot of practice. It is because lantern workers do not make the opportunity for practice, and so become efficient that the best results are not obtained in public. My advice to all purchasers and users of apparatus is, and always has been, never go into public until you have had at least six rehearsals and mastered the details of your gas supply, fitting up, obtaining a proper light, and have accustomed yourself to the routine of changing the slides, turning the lime, regulating the light, and cutting off or dissolving, so that you can accomplish it without fluster. Coolness is a great qualification in an operator, for under most advantageous circumstances, operating is a warm job, and, if fluster is imported into the work, then it reduces the amount of pleasure given to the audience, and certainly produces uncomfortable feelings in the operator.

THE designs for lanterns this season do not seem to be much altered from last, and the departures in design tried a few years since apparently fail to secure a large number of supporters. There



is nothing like having a reasonable size body to contain the illuminants, and permit of properly getting the hand inside to reach condensers, adjust lime light jet or arc lamp, and, above all, to obtain sufficient air space to keep reasonably cool, and permit of a fresh air current passing through; the stage to be sufficiently steady to prevent the carrier shaking when changing slides, and so obviate any apparent movement of the view or projection on the screen; the front lens to be of such a focus as to be at a reasonable distance from the screen for the size disc required, and, what is not as often considered as it might be, the focal length of the condenser should be proportionate to the objective, for the very short-focus condensers suitable for the oil light are not at all satisfactory when long-focus objectives are employed for long-range projections. G. R. BAKER.

### PHOTOGRAPHY OF SOUND WAVES BY THE "SCHLIEREN METHODE."

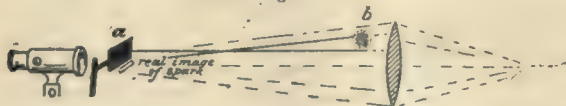
[Abstract of a paper contributed by the author to *The Philosophical Magazine*.]

I HAVE always felt that the very beautiful optical method devised in 1867 by Toepler,\* for the study of "Schlieren," or strisæ, is not as well known outside of Germany as it deserves to be, and trust that the photographs illustrating this paper are sufficient excuse for bringing it before the readers of the *Philosophical Magazine*. Sound waves in air were observed by Toepler, but they have never, to my knowledge, been photographed. When seen subjectively, the wave fronts, if at all complicated, cannot be very carefully studied, as they are only illuminated for an instant, and appear in rapid succession in different parts of the field of the viewing telescope.

It occurred to me that, if these waves could only be photographed, a most valuable set of lantern slides could be prepared for illustrating to students the changes in the form of the wave front after undergoing reflection, refraction, &c.

In teaching the subject of optics we are compelled to resort to diagrams when dealing with the wave front, and the student is apt to get the idea that it is merely a sort of a conception, and that the ray is the real thing. I have found these pictures of sound waves very valuable in checking this notion, showing as they do the bending of the wave front by refraction through a prism, the converging wave from a concave reflector, the secondary wavelets formed by transparent and opaque gratings, the diffraction produced by the edge of an obstacle, and other phenomena connected with wave motion. The apparatus used for photographing the waves is essentially the same as that which Toepler used for viewing them, except that the illuminator has been improved so as to give a much stronger light than the one originally used, which was far too feeble to affect the photographic plate.

Fig. 1.



The general arrangement of the "Schlieren" apparatus is shown in fig. 1. A good-sized achromatic lens of the finest quality obtainable, and of rather long focus, is the most important part of the device. I have been using the object-glass of a small telescope figured by the late Alvan Clarke. Its diameter is five inches, and the focal length about six feet. I have no doubt but that a smaller lens could be used for viewing the waves, but one of at least this size is desirable for photographing them.

This lens is mounted in front of a suitable source of light (in the present case an electric spark), which should be at such a distance that its image on the other side of the lens is at a distance of about fifteen feet.

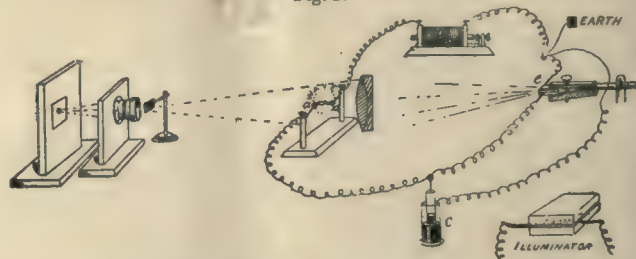
The image of the spark, which we will suppose to be straight, horizontal, and very narrow, is about two-thirds covered with a horizontal diaphragm, *a*, and immediately behind this is placed the viewing telescope. On looking into the telescope we see the field of

the lens uniformly illuminated by the light that passes under the diaphragm, since every part of the image of the spark receives light from the whole lens. If the diaphragm be lowered, the field will darken; if it be raised, the illumination will be increased. In general it is best to have the diaphragm so adjusted that the lens is quite feebly illuminated, though this is not true for photographic work. Let us now suppose that there is a globular mass of air in front of the lens of slightly greater optical density than the surrounding air, *b*. The rays of light going through the upper portion of this denser mass will be bent down, and will form an image of the spark below the diaphragm, allowing more light to enter the telescope from this particular part of the field; consequently, on looking into the instrument, we shall see the upper portion of the globular mass of air brighter than the rest of the field. The rays which traverse the under part of *b*, however, will be bent up on the contrary, forming an image of the spark higher up and wholly covered by the diaphragm, consequently this part of the field will appear black. It will really be understood that with the long path between the lens and the image a very slight change in the optical density of any portion of the medium in front of the lens will be sufficient to raise or depress the image above or below the edge of the diaphragm, and will consequently make itself manifest in the telescope.

The importance of using a lens of first-class quality is quite apparent, since variations in the density of the glass of the lens will act in the same way as variations in the density of the medium before it, and produce unequal illumination of the field. It is impossible to find a lens which will give an absolute even feeble illumination, but a good achromatic telescope objective is perfect enough for every purpose. A more complete discussion of the operation of the apparatus will be found in Toepler's original paper in the *Annalen*. The sound waves, which are regions of condensation, and consequent greater optical density, make themselves apparent in the same way as the globular mass of air already referred to. They must be illuminated by a flash of exceedingly short duration, which must occur while the wave is in the field of view.

Toepler showed that this could be done by starting the sound wave with an electric spark, and illuminating it with the flash of a second spark occurring a moment later, while the wave was still in

Fig. 2.



the field. A diagram of the apparatus used is shown in fig. 2. In front of the lens are two brass balls, *a, a*, between which the spark of an induction coil passes, immediately charging the Leyden jar, *c*, which discharges across the gap at *e* an instant later. The capacity of the jar is so regulated that the interval between the two sparks is about one ten-thousandth of a second. The field of the lens is thus illuminated by the flash of the second spark before the sound wave started by the first spark has gone beyond the edge of the lens.

To secure the proper time interval between the two sparks it is necessary that the capacity of the jar be quite small. This limits the length and brilliancy of the illuminating spark, and with the device employed by Toepler I was unable to get enough light to secure photographs of the waves. After some experimenting I found that, if the spark of the jar was passed between two thin pieces of magnesium ribbon pressed between two pieces of thick plate glass, a very marked improvement resulted. With this form of illuminator I found that five or six times as much light could be obtained as by the old method of passing the spark between two brass balls.

The spark is flattened out into a band, and is kept always in the same plane, the light issuing in a thin sheet from between the plates.

\*Wied. Ann. cxxxi. p. 33.



By this arrangement we secure a light source of considerable length, great intensity, and bounded by straight edges, the three essentials for securing good results. The glass plates, with the ribbon terminals between them, must be clamped in some sort of a holder and directed so that the thin sheet of light strikes the lens. This can be accomplished by darkening the room, fastening a sheet of paper in front of the lens, and then adjusting the plates so that the paper is illuminated as much as possible. The image formed by the lens will be found to have very sharp, straight edges, on one of which the edge of the diaphragm can be set in such a manner as to allow but very little light to pass when the intervening medium is homogeneous. A very slight change, however, in any portion may be sufficient to cause the entire amount of light passing through that portion to pass below the diaphragm and enter the telescope.

This arrangement of the spark terminals between plates of glass is also convenient for spectroscopic work, as the spark is concentrated into a very narrow bright line, which is fixed in position instead of wandering about, as it is apt to do when passed between uncovered terminals.

For photographing the waves the telescope was removed, and a Zeiss photographic objective put in its place. A vertical board was firmly clamped behind this in such a position that the image of the balls, between which the sound spark passed, would be in focus on a plate held against it. This arrangement was used instead of a camera, because it was necessary to move the plate rapidly during the exposure, to prevent the image of more than one wave being formed on the same place. It was found that simply holding the plate in the hand against the vertical board and advancing it slowly from left to right, at the same time giving it a rapid up-and-down motion, answered every purpose. It must be borne in mind that the image of the 5-inch lens on the plate was only about 13 mm. in diameter, and that the field surrounding it was dark; consequently a large number of images could be secured on a single plate.

These images showed the waves in different stages of development, for the time interval between the two sparks varied between rather wide limits. This was really an advantage, for on a single plate it was possible to pick out a series showing the successive changes in the form of the wave front produced by reflection, refraction, &c.

PROFESSOR R. W. WOOD.

#### CLEANLINESS IN LANTERN SLIDES.

TWENTY-FIVE years ago the making of a lantern slide was a very different matter to that of the present-day procedure by means of a dry lantern plate, and but a small percentage of those who now pose as expert slide-makers know anything about the working of wet collodion and the precautions necessary to ensure the various chemicals working not merely satisfactorily, but especially with a view of turning out slides that were brilliant and absolutely clean from any surface deposit or other defects.

With the modern lantern plate the production of a lantern slide, either by contact or reduction through the camera, is one of the easiest tasks in photography, and the simplicity of the operation has, no doubt, tended to introduce an amount of carelessness which, with wet collodion, would be fatal to the production of work of this kind.

In all lantern-slide work one of the chief essentials to a brilliant picture is the practising of the most scrupulous cleanliness, not only in the manipulation of the sensitive plate, but also in the preparation of the various solutions used. With wet collodion, this was a *sine-quâ-non*, and the using of any unfiltered solution was a thing never dreamed of. How many workers are there at the present day who ever give a thought to the filtering of their solutions when using a lantern dry plate? But very few, I fear; and yet it is by no means an unnecessary procedure if slides are to be turned out that are absolutely clean and free from various defects.

Some, no doubt, may argue that there is no need for such precautions with the modern dry plate; but I venture to assert that between two workers, one of whom studiously attends to the filtering of not only his developing and fixing solutions, but also carefully washes his slides with filtered water, and another who just fires away without such precautions, there will be seen a vast difference in the quality of the results that they turn out.

The difficulty of turning out an absolutely clean lantern slide by means of a dry plate is far greater than many imagine, and in nine cases out of ten defects are attributable to want of cleanliness in the washing of the them after they have run the gauntlet of development and fixing.

But few water supplies are beyond suspicion of containing suspended matter and other impurities, and if any one imagines that in this respect they are better off than their neighbours, and on that account do not require to resort to the tedious operation of using only filtered water for their washing of lantern slides, just let them try the effect of placing a quantity of their "above-suspicion *aqua*" in an ordinary wash basin, before going to bed, into which a teaspoonful of powdered alum has been stirred, and let them note the results when they get up in the morning, and I venture to assert they will have their eyes opened in a manner they little dreamt of. The fact is, that when dealing with such delicate pictures as glass positives, where brightness is of the first moment, no water supply is beyond suspicion of being unsuitable for the washing of same that has not been carefully filtered.

And if so much depends upon the final stage, certainly equal precautions are necessary in the making up of the various solutions used in development and fixing. Over and over again we see the advice given to preserve an old hydroquinone developer for the purpose of yielding vigour or pluck in the development of lantern slides, for which purpose there is no doubt that it is admirably suited; but the use of such a spent developer means the application of such solutions for several minutes' duration of time, and as a general rule these old hydroquinone solutions are never free of sediment, and always throw down more or less surface deposit on the plate that no amount of washing will effectually remove. Cotton-wool has been recommended to swab the surface of a plate free from surface deposits, but surely prevention is much better than cure in a matter of this kind. With a hard horny film of collodion, cotton-wool was regularly employed by old wet-plate workers, and such, to use a common expression, never or very seldom made its presence felt otherwise than by accomplishing what it was intended to perform; but, with a soft gelatine plate, even cotton-wool unskillfully applied to such a surface is very liable to cause scratches and other defects, especially if the temperature of the various solutions be at all high.

Dirty fingers are another fruitful source of defects in lantern slides, and but few workers have any idea how an individual shut up in a dark room will contaminate his fingers, even by the act of merely lifting various bottles or trays and other articles indispensable to the fitting up of a dark room, as well as contracting other injurious matter from the various chemicals he has to finger.

In a well-appointed studio, where the utmost precautions are taken to avoid any contamination when even an ordinary toning operation is being performed, different individuals invariably manipulate the prints at various stages, so that the one toning never brings his or her fingers in contact with anything but the toning bath, and such precautions soon reflect upon the percentage of perfect prints that result from this cleanliness; and, if in ordinary toning of silver prints such cleanliness is found to be required, how much more so when dealing with delicate transparencies?

In working some qualities of lantern plates it is almost impossible for any operator to turn out a large number of slides with his own hands unless special provision be made for a method of working whereby he is able to avoid fingering his hypo during the time development is proceeding. Hence, when any number of lantern slides are being produced, the services of an assistant whose duty is to attend to the fixing alone is always a wise precaution, and the substitution of dipping baths for the old-fashioned flat dishes is a distinct improvement. By using dipping baths there is less liability for the delicate surface to contract deposits; and, if such cleanliness is required up to and including the final washing stage, how necessary also is the need for the exercise of the utmost care in protecting the surface of the slides during the operation of drying?

With wet collodion, dust was ever the bugbear in lantern-slide making, and more especially was this the case when the varnishing stage was reached, and but very few slides indeed ever ran through the ordeal without some noticeable speck or flaw; but with gelatine, of course, this is avoided. Yet it is surprising how many fine slides come to grief during the drying operation from dust alone.

The operation of drying is best performed by rearing the slides end up on a clean linen cloth in a room where but little movement is required. Much ingenuity has from time to time been spent upon the construction of drying boxes or chambers, but for the mere drying of an insensitive plate they are not required. The chief factor to avoid is dust, and the less the plates are fingered or manipulated during the operation of drying the better. I know quite well, with amateur workers especially, the temptation to inspect and gloat over the production of some choice slide is very great indeed, and I know also quite well that at this stage very many good results come to grief from nothing else but the handling of the wet slides, and the sooner any one arrives at a fixed determination to overcome any little weakness during this stage the better will his results turn out.

Cleanliness at every stage is the sheet anchor in lantern-slide production, and once a worker makes up his mind to follow only a rigidly arranged method of seeing that all his solutions are carefully filtered and that no dirt reaches his slides during the operations of washing and drying, so soon will he be gratified at the vast improvement that will be noticeable in his results.

T. N. ARMSTRONG.



### THE ELECTROLYTIC INTERRUPTOR IN X-RAY WORK.

SINCE the publication of my article upon the above subject in THE BRITISH JOURNAL OF PHOTOGRAPHY I have continued to make experiments, the result of which I feel will interest those of your readers engaged in X-ray work.

The passage of the electric supply current through the interruptor is regulated by the following conditions:—

1. The relative sizes of the electrodes.
2. Their distance apart.
3. The specific gravity of the fluid.
4. The length of platinum wire exposed.

In order to obtain any interruptions at all, it is absolutely certain that the lead plate must present a surface many times the area of the

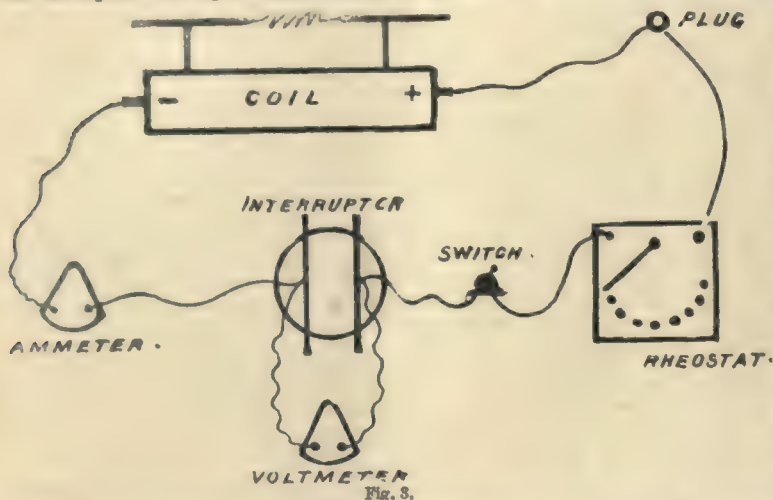


Fig. 3.

platinum wire. That there is no necessity, however, for the large surface of lead used in most interruptors, I have proved by experiment. With a platinum wire (20 B.W.G.) half an inch in length, I tried lead plates offering a surface of from one to thirty-two square inches, and the ammeter (an exceedingly delicate instrument) failed to show any appreciable difference in the amount of current passed.

In order to test the effect of distance between the electrodes, I constructed an interruptor in a glass tank over two feet in length. With a solution of sulphuric acid and water of a specific gravity of over 1015 only a very slight difference in the amount of current passing was noticed, no matter how small or great the distance between the electrodes. With a solution of very low specific gravity (1005) much more current passed when only half an inch apart than when the distance was increased to four inches; between four inches and two feet, however, no appreciable difference could be measured.

So much depends upon the specific gravity of the electrolyte, that too much attention cannot be given to this point. The amount of resistance offered by the interruptor can, by varying the specific gravity of the fluid, be regulated to the greatest nicety, and to such an extent as to render the use of a rheostat unnecessary. The experiments upon which these conclusions are founded were carried through with the assistance of Mr. J. C. Vaudry, the managing director of the Birmingham Electric Supply Company, who kindly placed at my disposal a voltmeter and ammeter of exquisite sensitiveness.

The experiments were made with a nominal 110 volt circuit, which at the time was supplying a regular flow of 119 volts. The arrangement of the apparatus during the experiments will be understood by reference to the diagram (fig. 3). The voltage of the current passing through the primary of the coil was measured by the drop which was registered across the interruptor.

The vessel containing the interruptor was large, and contained 200 ounces of solution. The platinum wire was 20 B.W.G., and half an inch was exposed. The lead plate was 16 square inches and the distance between the electrodes was  $8\frac{1}{2}$  inches.

In the measurements here recorded the rheostat was entirely cut out of circuit, the full 119 volts being passed through the interruptor.

With plain water, specific gravity 1000, the ammeter failed to give any reading, so that less than a quarter of an ampere passed. The voltage across the interruptor showed a drop to 115, thus 4 volts passed through the coil,\* which gave a spark of only half an inch in length. The platinum wire in the interruptor gave off but a few bubbles and did not become red hot. Half an ounce of pure

sulphuric acid was now added (specific gravity 1002). 3 amperes at 5 volts now passed a good supply of sparks 3 or 4 inches in length, passing between the sparkers. Sulphuric acid was now added, half an ounce at a time, until the specific gravity reached 1023, when 8.5 amperes at 13 volts was used. The spark now assumed the violet-blue colour mentioned in my last article, and twisted about between the sparkers, which were placed about 8 inches apart.

A complete record of the experiments will be seen by a glance at fig. 4.

These experiments prove that, with a platinum electrode of fair size, the interruptor can be completely controlled by varying the specific gravity of the solution, and, moreover, that the quantity of acid generally recommended is far in excess of that really necessary. A five per cent. solution, which, with the acid I used, gave a specific gravity of 1048, required, with the same arrangement, an additional resistance of about 5 ohms before it could be used with safety. Under these circumstances, however, matters can be speedily rectified by cutting off a piece of the platinum wire.

From these experiments I concluded that a 220 volt current would be used, which conclusion was subsequently verified.

The length and size of the platinum wire used in the anode constitutes one of the most important points in the construction of the interruptor, as has to an extent been already shown. I have been called to task by a contemporary for recommending a wire so small as 20 B.W.G. This has, in my hands, proved so successful that I continue to use it, I have never had the apparatus stop working since I adopted it, and I rarely get a broken tube. In most of the bought interruptors a larger size is used, but experience alone can teach which is the better.

An interruptor in which the length of the platinum wire exposed can be regulated at will is a great advantage, as, by taking note of what has been said of the influence of the specific gravity of the electrolyte, any size coil can be worked from any current up to 220 volts without a rheostat. An adjustable interruptor is shown in fig. 5. In this instrument the platinum wire passes through a small hole in a piece of china, or baked clay, the length being varied by the screw, A.

Fig. 6 shows a form of interruptor in which the anode is surrounded by a cylinder of lead.

It must be kept in mind that a considerable amount of gas is generated when an interruptor is at work, and, moreover, that it is given off in the proportions necessary for forming water; hence under no circumstances should a light be brought near the vessel after it has been working for any length of time, or a serious explosion may occur. It is also very desirable that, in covered interruptors, large holes should be provided for the free escape of the gases, or an explosion may occur from internal pressure.

The behaviour of Crookes tubes when worked with the interruptor is a matter of much interest. Small tubes are next to useless, as they heat very rapidly, and in many cases the vacuum is so much reduced after a few seconds working that no X rays are produced. They are not necessarily spoiled, as with the platinum contact-breaker the vacuum can soon be raised to the desired point again. I have purposely thus reduced the vacuum of several tubes I had put away as useless with a marked measure of success.

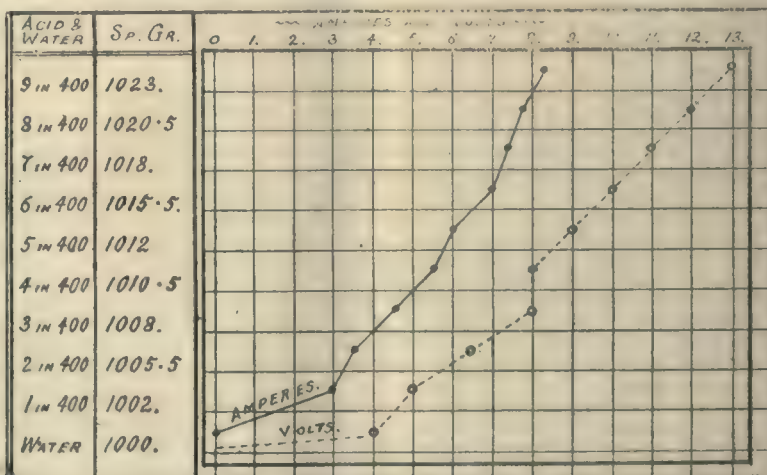


Fig. 4.

The tubes I have worked most successfully with the interruptor are large ones with a bulb of at least six inches in diameter. A medium high vacuum gives the best results, and it is an advantage to somewhat raise the vacuum of a new tube by means of the contact-breaker before

\* The coil, with platinum contact-breaker and 12-volt accumulator, gives a full 12-inch spark.



using it with the interruptor. A tube in which there is a tendency for the vacuum to increase even when the anti-cathode is raised to a red heat is the ideal one for working with the interruptor, and is likely, with care, to last for a considerable time. In some tubes, owing, no doubt, to the presence of some metal in the solder which is easily volatilised, the vacuum is reduced to such an extent as to render them next to useless immediately the current is switched on; such tubes are perfectly useless for our purpose.

In several tubes in which the anti-cathode is composed of a fairly thick piece of metal, with a thin covering only of platinum, a hole has been melted through the latter metal before any indication of its reaching the melting point was observed. As long, however, as the thicker metal support was not melted, I have noticed no great falling off in their working power. No tube in my hands will run for longer than a minute when sufficient current is passed through to enable it to give a maximum amount of X rays. The anti-cathode must be carefully watched, and the current switched off directly it assumes a full red heat. Fifteen to thirty seconds rest must be given before the current is again passed through. The having to switch on and off the current is a nuisance, which can only be avoided by a considerable alteration in the methods of manufacturing tubes.

I have noticed some curious phenomena in the working of tubes with the interruptor for which I can give no explanation. With the contact-breaker, or mercury interruptor when a tube reached so high a vacuum

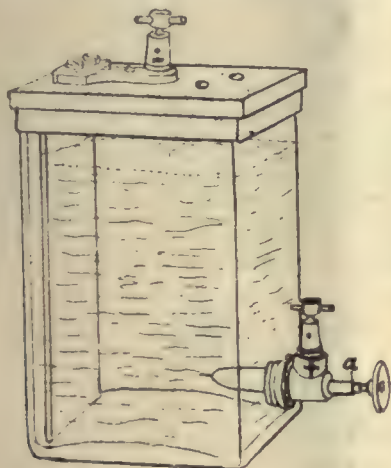


Fig. 5.

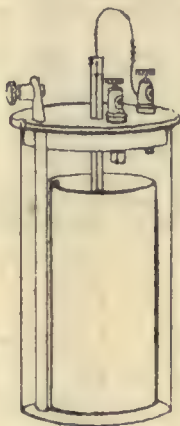


Fig. 6.

that sparks refused to pass through, they either jumped or brushed over the outside of the tube. When the same thing occurs with the electrolytic interruptor, the spark evidently passes through, as is seen by a small glow near the cathode end, or a bright spot somewhere on the surface of the glass, but no X rays are produced, although no sparks are to be noticed on the outside of the tube. If, however, the tube be left working, it will suddenly be lighted up, and will continue to work until it has again rested, when the same process will have to be repeated.

When passing a large amount of current through a tube of high vacuum, a fine brush of sparks sometimes covers the whole surface of the glass. Several times when doing this I have noticed that a patch of glass about three-quarters of an inch in diameter exactly opposite the anti-cathode pole, and immediately beneath the cathode, has ceased to fluoresce, and in the brightly lighted tube appears as a black patch. From the centre of this a bright, fairly thick spark passes to the cathode terminal. On first seeing this I naturally thought that the tube was ruined, so put in resistance and allowed it to go on working. Much to my surprise, the tube worked steadily on, so I again repeated the experiment. The spark in question appeared to come through the glass; at the same time the vacuum of the tube was not reduced. The experiment appears to be fraught with danger, but I mention it in the hope of getting some explanation of the phenomenon.

In using the fluorescent screen with the interruptor I have failed to notice any marked increase in the fluorescence, although its steadiness is a great advantage. In taking radiographs, however, not only does the necessary exposure appear to be lessened by the rapidity of the interruptions, but the power of the X rays appears to be increased. If this is so, I take it that the reason why the screen does not show more is due to the fact that under both conditions the maximum amount of fluorescence is produced, and, in order to obtain better results in this direction, we must have improved screens.

The introduction of the electrolytic interruptor opens up new fields for research, and, apart from its application to X-ray work, it is likely to prove of great service to mankind.

JOHN HALL-EDWARDS, L.R.C.P., F.R.P.S.

## SOME THOUGHTS ON LANTERN-SLIDE MAKING.

[Paper read before the Photographic Society of Philadelphia.]

BEFORE entering on this theme, it is well to state that it has been necessary to use slides for illustrating the various methods of work; as such, I trust they will answer the respective subjects for which they are intended, but wish to disclaim any intention of giving a slide exhibition. Also, as the reduction method used is fully set forth by Mr. Stieglitz, in his excellent paper on slides, of September 1897, I would call your attention to this paper for any further hints on the use of a reducer.

"How to make a good slide," could easily be answered by stating that no result is to be accepted that is not as good as the best *print* it is possible to make. This may rule out "the usual thing," but that doesn't out any figure.

How is the exposure for a lantern plate usually judged? Guessed at, and generally missed—sometimes don't even know it is missed.

How is the colour given by an exposure of this kind foretold? Simply accepted as "just what we wanted."

The method here given is used by the writer, but probably many of you have methods as good or better, and it does not do to say, "This is the way," or "That way will not work," as we find good results obtained by many means which we may consider not suited to our own way of working. What is claimed for this method is: positive results, quickness in arriving at the object worked for, and economy.

The negative is developed according to the subject and the result required, and not for any relation it may bear to the slide made therefrom. Of course, it should not be very dense, either for this or any other process in general use. Negative is proofed on glossy paper, giving full details. This proof is made with lighter or darker printing, or possibly local sunning, &c., until the tonality is correct; i.e., until the lights and shadows are properly combined. Thus far, the proof is the guide for either the finished carbon or platinum print, or the slide. The lack of this tone value has been the cause of so much adverse criticism in the past on lantern slides, and the criticism has been perfectly just. We have all seen slides with about as much atmosphere as a geometrical figure, and with as beautiful tonality as the noted poster of recent times. As this careful attention to the proper tone is the key to success, you will pardon the emphasis placed upon it.

In making lantern slides, every one must admit that there is considerable waste of plates, unless the best results are not looked for. There is a great latitude in a slow plate, but at the same time there is a certain exposure that is going to give the finest results, and that exposure has little or no variation.

In exposing a plate for a negative, we may give under or over-exposure, and by careful work can get a negative on which it is not possible to tell what exposure has been given. With the positive all this is changed. We work with an unchanged developer, and make our exposure do what formerly the developer did. In other words, the exposure, always under control, is the movable factor.

Before making the slide proper, a plate is taken and four exposures made thereon, as shown, each exposure starting with a corner in the centre, and covering one-fourth of the plate. This uses all the film,  $3\frac{1}{2} \times 4$  inches, giving four exposures, with almost all of the view on each. If this seems expensive, I would state that this method has been in use for a long time, and less than half the plates are now required in comparison with the usual method, and the results are absolutely sure, both in exposure and colour.

This quadruple exposure, as you see, varies in time. This slide is a reproduction of a test plate, on which the exposures were ten, fourteen, eighteen, and twenty-two seconds. The finished slide, made after this test plate, is now shown.

It is necessary to state that the slides are made by daylight projection into the dark room, no cover being used after the rays pass through the lens. This allows free access to the plate, and these four exposures are usually made in two minutes. A thirty-nine-inch pendulum swings near the plate. No focussing is required, as every one-sixteenth of an inch is marked with exact focus for any sized image. This saves much time, and is more accurate, as the original focussing was done with a ruled plate. Where a camera is used this same quadruple exposure can be made, possibly just as easy, depending on the arrangements.

It is developed in the developer referred to further on, and fixed. To avoid change of light, the process should not be delayed, but I have experienced no trouble from this, as the whole test takes about ten minutes. The image selected should be the one on which the detail is complete, and the densest parts of negative *not* represented by clear glass, unless it is a light, or sun breaking through clouds, &c.

This perfect exposure known, the plate, of which you have just made the cover glass, is exposed, and *correctly* exposed, which is a great satisfaction. It is put into the same developer, and developed denser than required, but I have not usually found it necessary to develop as dense as Mr. Stieglitz states: i.e., until nothing can be seen through the plate. After fixing, with proof in view, the proper graduation of tone is rendered by local reduction with Farmer's solution, applied with a soft brush. (When much work is to be done or the weather is hot, the slide is first soaked in dilute formalin for a short time.)

This allows one to produce as perfect an effect as the best-known ways of



control in printing. The ferricyanide and hypo must be dilute. I wish this could be emphasised, as the reason for so much failure with this reducer is the use of a solution that will work *quickly*, and this will not answer. As the reducer has stained no slides, no mention of caution is made, except to keep it dilute. After washing, you will have, not a chance production from a negative, but a *picture*. The graduation of light in a negative is seldom perfect, although a good printer can make perfects from it, and this reduction corresponds to control in printing. As a reducer, the ammonium persulphate is probably as useful as Farmer's solution. It has been found to work remarkably well, both entirely and locally, where less contrast was desired. After reduction, and a rinse in water, the plate is flowed, as though developing a wet plate, with a strong solution of sodium sulphite. After flowing it for a moment, it is washed well. The colour appears unchanged. Then this same plate, if necessary, can be reduced locally with Farmer's solution to get any required contrast. As the least carelessness in the use of this persulphate reducer will give a flat, worthless slide, it is necessary to use fully as much care as with the ferricyanide.

The developer used is hydroquinone, and it is not necessary to give the formula for this well-known oxidiser. Eikonogen has been used, also ferrous oxalate, and for certain effects, pyro. The slide, *A Wet Day on the Promenade*, is developed with pyro, as effective for this particular subject. Mr. John A. Hodges, of London, recommends this latter developer (pyro very much restrained), but for general work it does not seem to equal hydroquinone, which appears particularly adapted for slide making.

The fixing bath is plain hypo, one to two, or double the strength of a negative fixing bath. This is done to save time in the exposure test.

After a slide has been fixed and reduced, it is well washed and dried, usually before a fan. It is better to dry it as quick as possible. Then it is placed in the lantern for testing. If the reduction is not entirely satisfactory, it can be soaked and further work done on it. All authorities seem to agree that no slide should be judged except by its projection, as only in this way than the correct tone quality be decided.

**Colour.**—The colour of the slide is of great importance. Personally, I prefer a clear, warm black, not muddy, but brilliant where brilliancy is needed. A few slides will give an idea of this colour, which colour is decided when the test-plate is made.

Although the brown, over-exposed colour is used, it would seem very often produced because the right exposure is not known. In fact, if the value of the exposure is not known, one is liable to get any old tone, but you can always tell the exact colour of your slide by the test-plate. If any one wishes this brown tone, it is easily made by much over exposure and a greatly restrained developer; or an old developer is very good for this purpose. A slide is shown giving this colour.

**Toning.**—It sometimes enhances the beauty of a slide to change the colour, but I have never known a poor, weak slide to make a good one by so doing. The usual black colour, as shown, is the most useful, and can always be obtained by correct exposure. The uranium colour is frequently of use for entire or partial toning. It is produced by taking one and a half ounces of a solution of uranium nitrate, one to thirty, adding about ten drops saturated solution of potassium ferricyanide and about ten drops acetic acid. It is not necessary to give exact proportions, as different colours are required, and weaker solution and also the time of immersion are both controlling factors. The plate will change from a very faint tinge of red, through all the various shades, also running into the browns. The speed of this toning can also be regulated by the addition of the ferricyanide. When the required colour is reached, it is washed and held to the light. With a cotton wad, soaked in weak sodium carbonate, the uranium toning is removed from all parts which are to remain untomed. After washing and drying, the slide is tested for colour in the lantern. Some slides, so toned, are shown.

If a blue colour is desired, the red uranium tone will change to this colour by immersion in ferric chloride, a weak solution being used.

Should a green colour be wanted, immerse the fixed and well-washed slide in a weak solution of oxalate of iron and ferricyanide of potassium. It turns blue in this bath, and then is put into a weak solution of chromate of potassium. When the slide is dried from this bath, it will be green.

The above will give all shades of red, brown, green, and blue, and I do not think any further colours are needed. However, additional toning by gold gives many intermediate shades.

**Special effects.**—Sometimes we wish a very dense slide without having it suffer the slightest loss in detail. It is made by exposing the reversed image on the cover glass, reducing both this and the slide to half the required density, and binding in perfect register. A slide is shown made in this manner. This is also a useful way of making a good negative from a weak one.

**Clouds.**—In using clouds, pictorially, there is nothing so necessary as having the altitude correct. The lack of this makes it very easy for any one to recognise printed-in clouds. In fact, it catches the eye before the lighting of the clouds, which, of course, must be the same as the landscape.

In using a cloud negative, the cover glass takes the image reversed. With a landscape negative, we expose film to film. With a cloud negative, if lighting is correct, we expose glass to film, or, if the lighting of

clouds is to be reversed, then film to film. The whole of the cloud negative is put on the cover glass, and the lower portion removed with Farmer's solution.

In addition to clouds, anything from another negative can be printed, reversed, on the cover glass. In the slide before you the clouds are printed on cover glass, also the ripples in the water, three negatives being used.

This was to have been a short article on slides, and it has not been possible to go into details, indeed it is not necessary. If we have some object other than topographical interest, and those who see the projected slide can be made to, and really do, feel the effect we strive to convey, then, I say, we have a picture. Tonality plays a large part in this effect of conveying impressions, and it is well to give it careful consideration in our work, for, like charity, it covers a multitude of sins.

PRESCOTT ADAMSON.

## STEREOSCOPIC PHOTOGRAPHY.

BOTH IN THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for this year and in the JOURNAL for November 11 of last year you published a sketch and description of the arrangement devised by the late Mr. Latimer Clark for taking stereoscopic pictures with a single camera and lens. Having myself taken stereoscopic pictures by this method forty years ago, but on a somewhat improved plan to that in the sketch shown by you, and having the identical contrivance by me now, perhaps the accompanying sketch and description of it—the former drawn to about half size—may interest those of your readers who are engaged in stereoscopic work at the present day.

An ordinary tripod stand carries a flat table of wood, on which the mahogany frame (fig. 1), which carries the camera, rests. The camera I used was an ordinary quarter-plate sliding body camera, through the tail-board of which were drilled two holes to receive the screws, *A* (fig. 1), which are fixed to the parallel laths, the heads of the screws being let in flush underneath (see dotted lines). The laths, *B* (fig. 1), are parallel to each other, and when the camera is moved from side to side it moves in perfectly parallel lines, and in this position or when made to converge slightly, is best adapted for taking objects at a distance; but, when

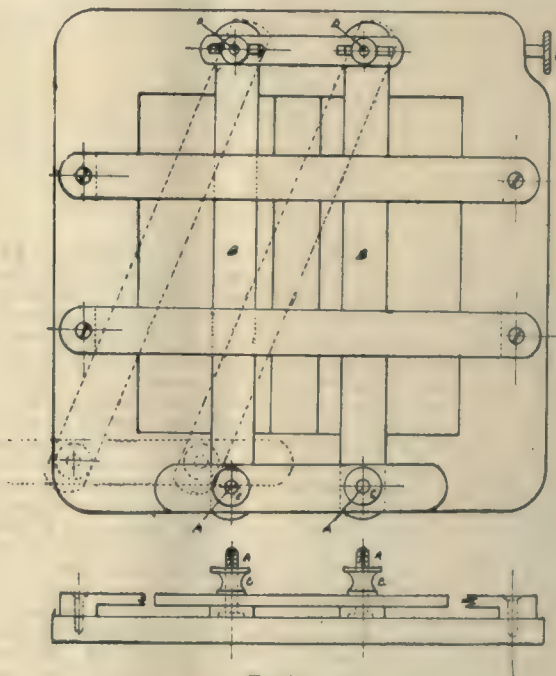


Fig. 1.

objects close at hand are to be taken, greater convergence becomes necessary. It will be seen that at the opposite end of the parallel laths screws, *B* (fig. 1), pass through them, somewhat similar to those which fasten down the camera, but with this difference, that the heads of the screws are square, with holes drilled horizontally through each and a right and left-hand thread cut in them respectively. They travel in a groove in the frame underneath and are actuated by a screw running through them with a corresponding right and left-hand thread cut on it, and by turning the milled head of which, *C* (fig. 1), the laths and camera are made to converge, or diverge, to any necessary degree. The dark slide (fig. 2) has an opening in the centre, *A*, the size of one picture, and over this opening is a sliding frame, *B*, fitted in the dark slide, which carries the plate,  $6\frac{1}{2} \times 3\frac{1}{2}$ , each end of the plate being brought over the opening as the



frame is moved from left to right (see dotted lines). The ground glass, which is detached, is ruled over with lead pencil into small squares, three-eighths or half an inch in size. To focus the object, move the camera to the extreme left (see dotted lines, fig. 1), and note carefully where any one part of the object intersects the lines of a particular square; now move the camera to the extreme right, and see if the same part of the object intersects exactly the same lines. If it does not, the camera must be moved back to the left position and the laths made to converge by turning the screw, E (fig. 1), until it is found, by moving the camera from left to right and *vice versa*, that the same object appears in the same place, or exactly intersects the same lines on the ground glass, when the camera is in both positions. This accomplished, remove the ground glass and substitute the dark slide. To take the pictures, move the camera to the extreme left and also the frame in the dark slide which carries the plate, lift the shutter and expose. Now move the camera and frame which carries the plate to the extreme right, expose, close the shutter, and the operation is over.

It will, of course, be understood that moving objects, or instantaneous work of any kind, is not within the scope of this arrangement, but the time required to take both pictures is very short, and I have taken portraits in a few seconds after the focussing has been completed. One

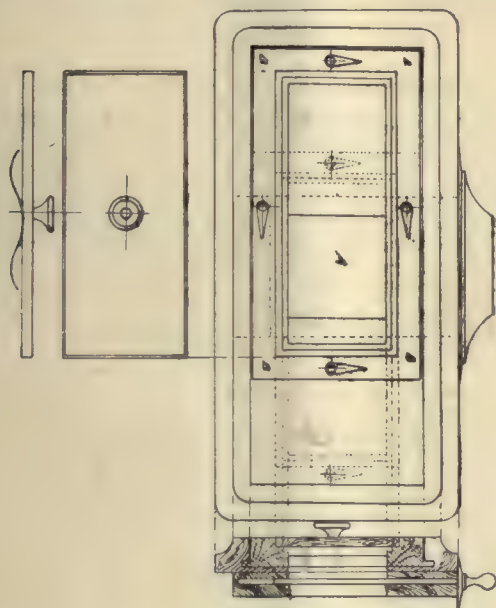


Fig. 2.

advantage of this arrangement is that the prints do not require to be reversed in mounting, and when viewed in the stereoscope will be found to combine and stand out in perfect relief, without causing any strain to the eyes, whereas pictures taken with a pair of lenses must be reversed, and require very careful trimming and mounting, in order to make them combine readily in the stereoscope without fatigue to the eyes. Should any of your readers be inclined to take up stereoscopic work with a single camera and lens, they will find the method I have endeavoured to describe give the best results. I have taken hundreds of stereoscopic pictures with both a single and pair of lenses, and, for perfect relief and true stereoscopic effect, the former has always pleased me best.

COLONEL.

#### A NEW ACETYLENE GAS BURNER.

ACETYLENE gas possesses so many advantages for isolated lighting that it is little wonder the industry is constantly progressing and is now on a sure foundation. One source of trouble which consumers have had with the new illuminant, says the *Scientific American*, has been that, owing to the great richness of the gas, it was not possible to provide burners which would consume more than one cubic foot of acetylene gas per hour without smoking and subsequent loss of luminosity. This difficulty has been obviated in a new acetylene burner invented by D. M. Steward, of Chattanooga, Tenn., by the grouping of any number of flames on one burner and by a new air-mixing device. Our engraving shows the construction of the burner. The pillar does not differ from those in general use. At the upper end of this pillar is fitted the head of the burner proper, which is made of lava or other similar substance. The burner stems extend from this head and diverge from each other. They are arranged in pairs, and the jet openings in each stem are adapted to direct the jet

toward that of the adjacent stem. Each stem is of cylindrical form, and is made slightly tapering, with the smaller end fitting into the openings in the head, and its larger end surmounted by a burner tip formed by an annular cup-shaped flange, D, and extension, A, in which the discharge opening is drilled. An opening, B, is drilled through the flange opposite the opening from the tube proper, C, which conveys the gas to the tip



A NEW ACETYLENE GAS BURNER.

(see fig. 2). Opening, B, in the flange is of larger diameter than that in the centre wall of the burner. This flange provides an air space between the extension, A, which terminates the end of the gas tube, C, and the interior of the flange, so that, as the gas is discharged from the opening, it will suck the air into the air space, and so provide for uniform admixture of the air with the gas discharged through the aperture in the flange. The air-mixing device is a unique feature of the burner, and is an improvement on all previous burners, the old method being to surround the jet of gas with a number of small inlets or holes for air. In the new burner the cup-shaped cavity provides a sufficient amount of air, and keeps the burner cooler than with any other known construction.

The tips are so arranged that the two jets are directed toward the jet from the adjacent tip, and inwardly in an oblique position. The jets so discharged from each tip commingle with the jets discharged from the adjacent tip on each side so as to form flat flames. The head being located between the pillar and the burner stems, the pillar is kept from becoming heated. The burners are made by the State Line Talc Company, Chattanooga, Tenn.

#### NEWS AND NOTES.

WRITING on the subject of a reproduction of a photograph of ribbon lightning in a recent issue, the *Scientific American* says: "An experienced photographer of lightning flashes informs us that this photograph is an excellent example of its kind, and states that the theory is that the lightning, in its passage through the air, is driven by the wind so as to flatten it out, giving it the ribbon effect. This may occur oftener than we are aware of, because, if the wind was driving the lightning toward or from the camera, the effect could not be observed. If, however, the wind blows across the field of view, then an opportunity is afforded for getting a picture of this curious kind of a flash. It is probable the study of photographs of lightning flashes may become as interesting as those on the subject of astronomy. Certainly some remarkable effects can be obtained if the proper advance arrangements are made."

ALL kinds of schemes are adopted on the Continent to outwit the surgeons who examine conscripts as to their availability for military service, and the Röntgen rays have unmasked such frauds. Some time ago a soldier in a military hospital claimed to have been bitten by a horse. A photograph of the finger was obtained, and five needles were discovered in it. The next day another photograph was taken, and it was found that the soldier had removed one of the needles. The



surgeon took out the remaining needles. The soldier had injured himself in order to obtain relief from irksome military service.

On the subject of apparent dark lightning flashes Dr. W. J. S. Lockyer writes to *Nature*: "On the evening of the 5th of the present month we were visited by a severe thunderstorm, which passed practically over this place. The lightning was very vivid, and at times occurred at intervals of only a few seconds. In order to photograph some of the flashes, I placed a camera on my window sill and exposed four films for consecutive periods of fifteen minutes each. During the exposures I was observing the sky, and repeatedly found that after nearly each bright flash I could see distinctly a *reversed image* of each flash in *any part of the sky* to which I turned my head. These apparent dark flashes, or, rather, the images on my retina, lasted for sometimes five to ten seconds. At the time I wondered whether dark flashes had ever been noticed before, and thought that this phenomenon was not uncommonly observed; but, seeing Lord Kelvin's letter in your issue of August 10, I send this note in case it may prove of interest."

A Lyons chemist has invented an acetylene lamp in which the gas is produced without water coming into actual contact with the carbide. The carbide is contained in a porous vessel, and the water in an outer vessel, and the humid atmosphere inside the carbide container, due to moisture passing through the porous walls, acts upon the carbide to generate the gas. The method is particularly applicable for bicycle and carriage lamps.

### SOME DRAWBACKS TO THE USE OF ACETYLENE.

[From the *Chemical News*.]

WHILE coal gas has had to struggle for a whole century before becoming the almost universal lighting agent, its rival, acetylene, has already—after only a short time—achieved a certain success. Of course, acetylene is not a newly discovered body, but it is only since the economic production of carbide of calcium that it has become practicable as a lighting agent.

Theoretically the production of acetylene is a very simple matter, but such is not the case practically.

Carbide of calcium, as is well known, is a black, crystalline, very hard material, not decomposed by heat, but easily decomposed by water into acetylene and lime. It has a density of 2.2, and it is not soluble either in petroleum or in benzene.

Concentrated acids have no action on it.

Acetylene consists of a colourless gas, with a penetrating odour of garlic. Its density is 0.1; 1 litre of acetylene weighs 1.16 grammes. It is easily soluble in water, and can be liquefied at 0° under a pressure of 48 atmospheres. In this state it is very explosive. It burns with a white flame, without a dark cone; the temperature of this flame is lower than that of coal gas.

Unfortunately, lighting by acetylene still presents numerous difficulties, to which I am desirous of calling the attention of specialists and others, now that I have had the opportunity of examining the installation which supplies the town of Veszprim in Hungary.

Let us first consider the carbide, the source of all the trouble. This body is never pure, but always contains at least twenty per cent. of impurities. Theoretically, 64 parts by weight of carbide should give 26 parts by weight of acetylene—that is to say, that 1000 grammes of carbide ought to produce 406.25 grammes of acetylene; and, as 1 litre of this gas weighs 1.16 grammes, we ought to get 350 litres. But the Continental factories will not guarantee a return of more than 300 litres, and practical experience shows that we can hardly depend on more than 280 to 290 litres. It is true that the estimation of the return is not free from causes of error, inasmuch as during the weighing the carbide absorbs a certain amount of moisture from the atmosphere; this causes a loss of acetylene. But the small errors which result, when calculated on 1000 grammes of material, are multiplied in proportion. We are obliged to work with small quantities, seeing that only 100 grammes of material give off 30 litres of gas, and it is difficult to arrange graduated gas-holders to store such large quantities. Further, the carbide is so little homogeneous that several samples must be tested and examined in order to obtain a mean value. If, on the other hand, we only take 10 grammes, the error resulting from the disengagement of acetylene in the air will be multiplied 100 times if the results are calculated, as they should be, on 1000 grammes. I have examined the manner in which the carbide behaves in the presence of acids, and I found that concentrated sulphuric acid has no action on this body; but, no matter how little water the acid may contain, bubbles of gas are formed until the whole of the water is consumed. This property of the carbide of not being attacked by concentrated sulphuric acid enables us to estimate its producing power of acetylene. I have made several experiments in this direction, and the results obtained were fairly correct and concordant.

I must here again mention that the carbide contains sulphur, phosphorus, and nitrogen, from which it results that the acetylene will be

contaminated with sulphuretted hydrogen, phosphoretted hydrogen, and ammonia. The acetylene must therefore be purified to the same extent as is coal gas, for fear that its use in closed places might cause serious accidents.

But the greatest drawback of all is that acetylene burns with a smoky flame. Certainly the flame does not smoke at first, but after 200 or 300 hours smoke begins to be formed. This is caused by the burners attaining a temperature higher than that of the decomposition of acetylene, and thus the gas is decomposed into carbon and hydrogen.

I have also noticed a very curious phenomenon in the gas pipes; I there found a deposit of finely divided carbon like soot. I also found a very remarkable liquid condensation, consisting of carbides of hydrogen. These bodies are also formed in the generators, whence the necessity of using siphons. We thus see that it is quite erroneous to imagine that acetylene does not require purifying.

There is still another inconvenience resulting from impurities contained in acetylene. It is by no means uncommon to see, in a closed place, a sort of fog fill the room after a longer or shorter interval. What is the cause of this phenomenon? The acetylene is decomposed in the burner, the carbon is deposited while the hydrogen burns, giving rise to the formation of watery vapour; and it is this, in conjunction with the ammonia, the sulphuretted hydrogen, and the phosphoretted hydrogen, which produces the fog, causing headache and nausea.

PROF. J. VÉRTÈS.

### PHOTO-MECHANICAL LANTERN SLIDES.

PROFESSOR ERREERA, of the Brussels University, has published some improvements in the production of slides for optical lanterns. In carrying out his invention, he prints the image with transparent ink by any suitable process of photographic reproduction on a transparent support.

Such support may be celluloid, gelatine, collodion, mica, specially prepared glass, or any other transparent and suitable substance.

In this way the lantern slides are mechanically produced either in black or single colours, or in a series of colours, such as the natural colours of the object, which are obtained by successive printings in colours on one and the same support by means of separate blocks or plates, each obtained from a different negative of the same object, the negatives being respectively made after interposing a coloured or intercepting screen.

The preparation of lantern slides in the case where it is desired to reproduce the natural colours of objects has heretofore usually been a long and costly process, though various methods are employed for producing them, among which are those suggested by Lippman, Maxwell, Cros, Ducos du Hauron, Richard, and Ives.

The method employed of printing the required number of transparent positives on the same transparent support is rendered possible by the employment of a support which is at the same time transparent and sufficiently flexible to enable the mechanical printing to be effected.

As an illustration of one manner of producing a slide in natural colours, he gives the following:—

A first negative is obtained on a plate or support sensitive to yellow and green rays, after interposing a colourless solution absorbing the ultra-violet rays (for example, a solution of alkaline nitrate) and a yellow intercepting screen (for example, a solution of ammonium picrate, or a gelatine film stained with ammonium picrate). A second negative is obtained on an ordinary plate or support (which is sufficiently sensitive to blue and violet rays) after interposing the aforesaid colourless solution and a violet intercepting screen (the latter, however, not being absolutely necessary). A third negative is obtained on a plate sensitive to orange and red rays, after interposing the above colourless solution and an orange-red intercepting screen (for example, a solution of erythrosine and aurantia, or two gelatine films, respectively stained with eosine and aurantia).

These three negatives are used for obtaining in some well-known way three blocks or plates either by photo-collography (bichromate-gelatine process), or in phototype-engraving, with the help of a net or mesh ("phototypographe").

From the plate of negative No. 1 may be obtained a crimson print, from the plate of negative No. 2 a yellow print, and from the plate of negative No. 3 a greenish-blue print, all three being made with transparent inks on a single transparent, smooth, and flexible support.

The best support appears to be celluloid or gelatine, though it is possible also to succeed with collodion, mica, or specially prepared glass.

In *Astronomische Nachrichten*, 3565, Sir William Huggins, in a short note, preliminary to a fuller account to appear in his book of photographs of star spectra promised for early publication, announces that he is able to confirm Mr. McClean's statement as to the presence of oxygen in stars characterised by the presence of strong helium lines. In the ultra-violet about ten lines, considered to belong to oxygen, appear to coincide with lines in various helium stars, though the relative intensities of the oxygen lines, as observed in the laboratory, do not exactly agree with their relative intensities in the stars.



# MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."]

[October 6, 1899

# THE LANTERN RECORD.

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## LANTERN NOTES AND NEWS.

MM. BERTHELOT and DELÉPINE have experimented on the compounds of acetylene with silver, silver nitrate, sulphate, chloride, and iodide. When heated in a vacuum, dry silver acetylide,  $\text{Ag}_2\text{C}_2$ , detonates, with formation of a reddish flame. This flame is scarcely to be expected, since the products of the explosion are solids, silver and carbon. However, investigation of this matter leads to the conclusion that the temperature of the reaction is high enough to volatilise the carbon, and that the flame is gaseous carbon at a very high temperature, probably approaching  $4000^\circ\text{C}$ .

THE big exposition at Niagara Falls, says *Electricity*, will be the occasion of what will, doubtless, be a most brilliant and startling illumination. The idea is to erect a series of tall towers on both the American and Canadian sides of the river. On the top of these lofty spires huge electric searchlights will be placed, in such manner that they may be played on any part of the Falls. The imagination may picture the dazzling effect that will be produced when a score of those powerful instruments of illumination are brought to bear upon the rushing waters as they tumble irresistibly over the rocky ledge into the depths beneath. A constant change of colours will be used in the manipulation of the searchlights, so that now the Falls will be like molten silver, again a flood of crimson, again as green as old ocean itself, and so on through the whole gamut of colours of the painter's palette. The astonishing effect will be still further heightened by the use of electric arc lights in the Cave of the Winds, which will give to the water as it falls in front of it a weird, phosphorescent glow. The power of this record-making illumination will be all within easy reach, as Niagara will itself be made to do all the necessary work.

"OMEGA" writes to the *Daily Chronicle* to say that the evil of the objectionable mutoscope is not confined to the metropolis and seaside. He travels about the country and finds the same scandal everywhere. "In a Midland city which is renowned for the large number of young people that compose its population and are employed within its borders, I made a personal investigation of one of these exhibitions. A shop in a prominent street had been hired for the purpose. The admission was free, but a penny was charged for

each view. I frankly admit that some of the pictures were refined and beautiful, but these were interspersed with others of a low nature. Those which were not flagrantly obscene were suggestive of evil and calculated to engender foul imaginations and impure thoughts. Around one of the most impure of these exhibits I watched a group of girls, ranging in age from ten to fifteen years. An outer circle was formed by youths and men, who, with leering eyes and base language, supplemented any vicious suggestions these pictures had already made."

ACCORDING to *Comptes Rendus*, MM. Berthelot and Le Chatelier have studied the velocity of propagation of the detonation of acetylene under different pressures and with other varying conditions. The gas was contained in horizontal glass tubes about one metre long and of diameter between two and six millimetres. It was introduced under pressures varying between five and thirty-six atmospheres, and was found to contain ninety-eight per cent. of acetylene. The gas was fired electrically, a small piece of fulminate being used, and the registration of the phenomena was made by the photographic method, which method gives an exact record of all the phases—at least, in so far as the gas remains luminous.

THE following are next week's Lantern fixtures at the Royal Photographic Society's Exhibition: Saturday, October 7, "A Trip to Paris, *via* Newhaven, Dieppe, and Rouen," by Algernon Brooker. Monday, October 9, "Zoological and Other Animal Studies," by Henry Sandiland, J.P. Wednesday, October 11, "Beauties Old and New in the French Riviera," by S. J. Beckett. Saturday, October 14, "Mountaineering within the Arctic Circle," by Mrs. Main.

AN additional attraction was given to the Royal Photographic Exhibition on Wednesday evening, September 27, by a lecture on the Royal Palaces of England and Scotland. The lecturer was Mr. Horatio Nelson King. The series included several new photographs taken at Osborne by the Queen's command last August. The private and State apartments in the several palaces were shown on some 200 slides. From the educational, no less than the artistic, point of view the lecture was charmingly interesting.

MR. BIRT ACRES announces the imminent introduction of a new light for lantern purposes; it is described as safe, non-explosive, and portable. Affording an illuminating power of from 600 to 1000 candles, it requires neither cylinders nor generators, and gives off practically no heat.

THE following is Messrs. Newton's list of new slides for the season 1899-1900: Wireless Telegraphy. Birds and Animals, by R. B. Lodge. Spiders and Insects and Butterflies. Canterbury—



the City and Cathedral. China. Burma. Malay Archipelago. National and Tate Gallery. Belgium. Elements of Agriculture—Cattle and Wheat. St. Paul's Cathedral. The Thames. Flower Studies. Australia—Up Country. Meteorology. Astronomical Work in the Solar Physics Observatory. Lang's Fairy Tales. Alice through the Looking-glass. Stations of the Cross from Wood Carvings. Chinese Illustrations of Bible Stories, &c.

### LANTERN MEMS.

"WHERE are the lantern slides?" This question was asked more than once by visitors to the Exhibition of the Royal Photographic Society at 5A, Pall Mall, and certainly this particular class of photography, which, as an exhibit, has been getting smaller by degrees and beautifully less of late years, has this year reached a minimum that can almost be counted on the fingers of both hands. Why is this? One explanation offered was that no medal for this class of subject had been awarded for several years, and therefore it was probably answerable for the want of interest or the lack of exhibitors. Cannot the Council of the Royal Photographic Society reconsider this matter, and try for next year's annual to get a really representative show of transparencies at the new rooms?

It might also be worth while to invite trade exhibits of new subjects, and provide suitable screens or frames where the photographs can be properly shown without having to pass through curtains into a curious little "cubby house," and dodge steps that lead up to the operating sanctum. Only a few of the visitors who are strangers to the Gallery understand that lantern transparencies can be seen on passing into this place. If table room was provided, and hanging or other electric lamps arranged so as to give a brilliant reflected light, we should have our large (and small) slide producers sending the pick of their new subjects, but the fee for space must not be prohibitory. These slides would be attractive and allow of a closer examination of those subjects which specially appealed to one at the time of their exhibition on the screen, for each frame should in turn be emptied during the season, and passed through the lantern and replaced in the frame the next day at latest.

If these transparencies were mounted, say, six in a carrier, they could be quickly taken out of the show frame before the Exhibition, and very quickly replaced after the lantern projections were finished, and members and visitors from the country who could not perhaps make a second visit could judge so much better what to aim at in their own work in future, for it is a truism that many slides that look well in the hand are disappointing on the screen, and *vice versa*. While on the subject of transparencies I should like to mention the stereoscope, and that this deserves more encouragement and better treatment. I suggest that a really first-class instrument or several should be available, and so placed that they have a separate illuminator, in order that the beautiful stereoscopic effects can be appreciated. With these remarks and hints for a little more "stage management," I pass on to a subject for which I have nothing but praise.

The lantern display on Saturday evening was in every way satisfactory, a clear and well-defined picture of a series of photographs of a "Visit to Ireland," that were not only beautiful but interesting to a degree. They were lantern transparencies made from negatives taken by the members of the South London Photographic Society, and arranged by Mr. C. H. Oakden. I was personally more interested from the fact of having this year and last visited some of the places depicted, and could not help being charmed by the lovely light and shade shown in the pictures of lake scenery, waterfalls, bracken, vegetation, and landscapes, while the short description and humorous references prevented anything like monotony supervening. Until I knew it was collective work of members, I said, if a "one man" show, the photographer must have been indefatigable, for so many,

different points of view were shown of interesting places, relics, &c., each having more or less a charm of its own.

I WAS in hopes of seeing some good examples of chromo-photography for the lantern, but had only the satisfaction of viewing two or three specimens of trichromate printing by Mr. E. Sanger Shepherd. An apparatus for showing photographs in colour could not be tested, because no suitable light was available in the evening for the purpose. A very useful daylight dark slide was exhibited at the table on behalf of Messrs. Mackenzie & Co., of Glasgow, and, if it and the envelope containing the sensitised plate are really light-tight, it will be an enormous advantage to travellers who prefer to use plates, and do not care to develop *en route*, or who cannot have resort to the dark room, or prefer not to carry a number of ordinary double dark slides. With this arrangement, if proved to be reliable, a saving in bulk will be effected, and one special dark slide sufficient for any number of plates to be exposed as required. It often happens that, after the last plate that one has in the double dark slide has been exposed, a particularly "pretty bit" or interesting subject is seen, and with the plates in envelopes a few extra for emergency use can be taken without inconvenience.

I HAD hoped to see some novelties in optical lanterns, but beside the Biokam, for miniature animated photographic projections, there was little else. Next year, perhaps, a larger space can be devoted to apparatus for projection, and the inventors or manufacturers induced to send up-to-date instruments, so as to make the section worthy of the Society's Exhibition. When one knows that Messrs. Swift, Newton, Steward, Butcher, Hughes, and others have been working on photo-micrographic apparatus, projection microscopes, optical lanterns, and special illuminants, the question arises, "Why are they not exhibiting?"

G. R. BAKER.

### AN ANALYSIS OF LANTERN PLATES.

PROFESSOR VALENTA gives an analysis of several kinds of lantern or transparency plates in the *Photographische Correspondenz*. The names are suppressed, and Roman figures substituted for obvious reasons, but certain English makes, which enjoy considerable reputation in Germany, and some American are included. For the analysis the plates were weighed before and after boiling in dilute nitric acid, to ascertain by the difference in weight the quantity of emulsion on each plate. The solution obtained was then boiled until the silver salts precipitated, after being allowed to stand for a short time. The salts were collected by filtration, washed with hot water, dried, and weighed. The total of chloride plus bromide was thus ascertained. A portion was weighed off, treated with zinc filings and dilute sulphuric acid, and the quantity of reduced silver ascertained. This multiplied by 1.3287 gave the equivalent of chloride. By deducting the quantity of chloride from the mixture of chloride and bromide, and multiplying the difference by 1.798, the quantity of bromine present in the mixture of chloride and bromide was determined. The corresponding quantity of silver bromide was then calculated. The following results were obtained:—

Plate Number.	Colour after long exposure to light.	Thickness of film in mm.	Grammes of emulsion per 100 sq. cm.	Grammes of gelatine per 100 sq. cm.	Grammes of silver haloid per 100 sq. cm.	Proportions of haloids.	
						Bromide.	Chloride.
I.	Grey violet (slowly)...	0.04	0.396	0.324	0.062	85	15
II.	Grey (slowly) .....	0.04	0.418	0.365	0.053	100	—
III.	Violet .....	0.028	0.244	0.194	0.050	50	50
IV.	Grey (slowly).....	0.030	0.285	0.176	0.109	100	—
V.	Violet .....	0.028	0.286	0.190	0.090	36	64
VI.	Grey green (slowly) ...	0.036	0.229	0.158	0.071	90	10
VII.	Violet (rapidly) .....	—	—	—	—	10	90
VIII.	Intense violet (rapidly)	0.044	0.328	0.230	0.098	10	90
IX.	Reddish violet (rapidly)	0.036	0.174	0.115	0.059	20	80
X.	Violet .....	0.024	0.211	0.150	0.061	58	42
XI.	Violet (slowly) .....	—	—	—	—	70	30



## LANTERN-PLATE EMULSIONS.

In the article previously quoted, Professor Valenta gives the following formula, which he recommends. For plates suitable for normal negatives:—

A.	
Water .....	400 grammes.
Ammonium bromide .....	15.2 "
" chloride .....	1.5 "
Nitric acid.....	6 drops.
Gelatine .....	50 grammes.

B.	
Water .....	400 grammes.
Silver nitrate .....	30 "

For flat negatives, or for obtaining normal prints from flat negatives by reproducing the negative one or more times:—

A.	
Water .....	400 grammes.
Ammonium bromide .....	1.7 gramme.
" chloride .....	9.0 grammes.
Nitric acid .....	6 drops.
Gelatine .....	50 grammes.

B.	
Water .....	400 grammes.
Silver nitrate .....	30 "

Swallow the gelatine in the water, melt at 50° to 60° C. in a water bath, add the bromide, chloride, and nitric acid. Raise solution B to the same temperature, and add it in small quantities to solution A, well shaking the bottle in the intervals. Keep the emulsion warm for an hour, pour it into a dish, and, when set, break it up and wash it. After remelting, it is ready for coating the plates.

For the emulsion containing most bromide, use the following metal developer:—

A.	
Metal .....	10 grammes.
Water .....	1000 "
Sulphite of soda .....	100 "

B.	
Carbonate of soda (crystal) .....	100 grammes.
Water .....	1000 "

Use equal parts A and B.

For the plate containing most chloride use hydroquinone developer:—

Hydroquinone .....	3 grammes.
Sulphite of soda .....	100 "
Water .....	1000 "
Soda .....	200 "
Carbonate of potash.....	100 "
Bromide of potassium .....	3 "

This yields warm brownish-black tones.

The following bath for toning chloride plates will be found a good one:—

Chloride of gold.....	0.5 gramme.
Sulphocyanide of ammonium.....	8 to 10 grammes.
Water .....	1000 c. c.

## SPIRIT PHOTOGRAPHY.

DESCRIPTION in spirit photography has become a fine art. Many so-called "spirit pictures" have been taken upon plates that have already been exposed. When these plates are developed, the several faces, of course, are brought out. These prepared plates are held in stock by dealers in photographers' supplies, says *The Banner of Light*, and sold to all who send special orders for them. It is now well known that a certain symbol in the order for plates indicates that "doctored" plates are desired. In some cases, men and women who are perfectly honest with themselves are obtaining what they claim to be spirit pictures. They order their plates themselves, and take pictures of themselves by means of a mechanical device, develop the plate alone, and find faces side by side with their own on the plates. This would seem to justify them in believing the pictures to be likenesses of disembodied spirits. If they would reflect a little, they would not be so certain.

Pretended mediums for spirit photography know of the experiments of these parties to whom we refer. They notify the dealers in photographic

stock of the fact, and these dealers send them the prepared plates. The pictures are taken, and the amateur photographer becomes convinced of the truth of spirit photography because they alone were implicated in the experiment. The fact is they have been deceived in their plates through the efforts of some faker who wished to add to his own income, and to maintain his influence over the parties whom he is instrumental in deceiving. It is often done, and many reputable people are thereby victimised.

Occasionally a few of the prepared plates are slipped into the boxes ordered by regular photographers. They are not spiritualists, nor are the majority of their patrons. Every one is greatly surprised, therefore, to find half-dozen faces upon the proof of a certain plate. When the fact of these specially prepared plates is made known, the source of the phenomenon is easily determined. The unsuspecting person, however, does not stop to think of possible collusion in the case, and accepts the result as evidence of supernormal power.

## OPEN-AIR LANTERN DISPLAYS.

THE ardent lanternist, with the shortening days, will be furnishing up his apparatus, and, no doubt, feeling eager for an opportunity to have a lantern display. With many of them, no doubt, the idea prevails that, until the winter evenings set in, they need not look for any great hopes of opportunities to try their lanterns. There is, however, a most delightful field for lantern work during the early autumn evenings, for during the month of August and September open-air displays can be given that yield far and away beyond the pleasure experienced in working in some stuffy or badly ventilated room or hall during winter nights.

What better position for a lantern exhibition could be desired than that of a nice quiet garden, the atmosphere of which is laden with a wealth of perfume from choice flowers? And yet how seldom do we hear of the optical lantern being brought into requisition at such functions as garden parties, &c.

The idea, no doubt, prevails that the wind is almost certain to give trouble, but how many evenings are there when the air is perfectly still, and it is quite a luxury to sit in the open air for several hours after sunset, enjoying a pipe of peace or a fragrant weed.

During the present autumn it has been the writer's privilege to witness several lantern garden displays, all of which were more than appreciated by both old and young. Of course there are nights when any such displays would be out of the question, but there is at some season of the year always a spell of settled weather when an ardent lanternist can, with perfect confidence, rely upon suitable atmospheric conditions, and carry out a well-arranged programme of this description, feeling certain that any invitations he may favour his friends with will not be damped by adverse weather conditions.

The screen need not be other than that ordinarily used indoors, and, when stretched upon its frame, can always be utilised in some suitable part of a garden, one plan being to suspend the frame from the branches of trees, or, if the spot selected be against a house, a line let down from a window, and made fast to each of the top corners of the frame, will enable the same to be placed in almost any position.

As to the best light to employ, I have no hesitation in saying such is found in a good mixing jet, the power of which will depend upon the size of disc desired. In open-air working sizes of everything appear smaller than indoors, but any disc from twelve feet upwards will be found quite satisfactory, and a good single lantern, furnished with a modern dissolving carrier, will suit admirably.

If a twelve or fourteen-foot disc is selected, there will be no need to press the jets unduly, and, even with the slight amount of natural light which always remains during a summer or autumn evening, a very brightly lighted picture can be obtained.

The best hour to give entertainments of this description will be found to be about an hour after the sun has set, so that towards the end of August, when the sun sets about half-past seven, the lamp may quite well be brought into requisition shortly after eight o'clock, and this does not make the function unduly late, although it will rarely, if ever, be found that one's friends weary by too long a display.

An abundance of slides should be provided, for where there is no lecturing, or but a scanty description of the views thrown upon the screen, it will be found that even one hundred slides don't take a long time to slip through the lantern, and three times this number will often be required to satisfy an appreciative audience as they sip their coffee and smoke their pipes.

One of the most effective class of slides for open-air displays will be found in statuary subjects, and, when these have the background blocked out so as to show against a black ground, the effect is very striking. A large stock of good comic slides should also be provided; it is quite surprising how such good old stuff as the "Elephant and Nigger," or the "Mad Umbrella," yields so much delight to all and sundry. Of course there are comic slides that, unfortunately, must be deemed vulgar;



these are best left out; but still we have thousands to select from that are quite beyond suspicion, and a few mechanical slides, such as the "Red Man," always convulse the younger portion of the audience.

Coloured slides always look well when displayed in the open air, and perhaps there is nothing finer in this respect than flower studies, of which, during recent years, some excellent examples have been placed upon the market.

Animal studies also come out bold and striking on the screen, much more so than landscapes, so that it is well to spend a little time in selecting the best class of subjects to show.

If a blunial or triple is employed, then, of course, an additional charm is lent to such displays by including many effects, slides that, with proper care in registering, yield, perhaps, one of the most delightful entertainments imaginable. The introduction of the cinematograph has, no doubt, done much to throw dissolving effects by means of double or triple projection completely in the background, but there are those whose opinion is worth considering who prophesy that there will be a reaction before long in favour of the good old dissolving effects so popular a few years ago.

The belief is gaining ground that the cinematograph fosters vulgarity; this, of course, need not be. Yet, unfortunately, the music-hall displays of prize fights, and other similar views, have not tended to raise it in the estimation of the better classes.

In open-air lantern displays there is a field for much enjoyment during the summer and early autumn nights, which those who once experience are sure to wish repeated.

A. T. NEWTON.

### ASTRONOMICAL PHOTOGRAPHY.

At the Annual Meeting of the Oxford Camera Club, on Monday, September 25, the President (Sir William Herschel) said that he proposed to say a few words about the wonderful astronomical researches of Mr. Maclean, first begun in this country, and afterwards continued at the Cape of Good Hope. His work, undoubtedly, represented the greatest advance in astronomy during the last twenty-five years. To enable them to understand in some small degree the magnitude of his efforts, he would tell them that he had taken by means of photography the spectra of 276 stars in both hemispheres. In fact, all the stars of the first, second, third, and third and a half magnitude and, of course, those above the first. He had afterwards classified these stars by means of their spectra, and it was out of that work that his great discovery came, which made in future the Milky Way the basis of our study of the stellar universe. He did not propose to suggest what the Milky Way really was, but the large stars in it had now been shown to be, very near akin to various gaseous nebulae in other parts of the sky. He would throw on the screen a photograph of the nebula in Orion. As seen through a good telescope this was one of the most enchanting sights to be observed in the whole sky, but the photograph, through that peculiar and wonderful property of light known as actinic, showed a great deal that was not seen by the human eye. It was these nebulae that Maclean took for his first type, as he would explain later on. The photograph of the nebulae in Andromeda had peculiar interest, in that it disclosed the fact that it appeared to be a solar system in the first stage of formation, while all the human eye was able to discover through a telescope was that it was a mass of nebulous matter, of oblong form. The nebula in Orion had apparently reached a further stage of development, having a more perfect shape. Before the time of photography astronomers knew it as a ring of nebulous matter, but a photograph at once disclosed the fact that there was a mass of light-giving matter in the centre of the ring, indicating a solar system in course of formation, the gaseous matter gradually approaching toward the centre and consolidating to form a planet. Again, until the Pleiades were photographed, no one suspected that these stars were surrounded with nebulous matter, yet such proved to be the case, giving rise to the supposition that the Pleiades were planets in the last stage of formation. If this theory of the formation of stars were true, then it was possible to speak of the age of a star. Now, Maclean approached this subject from quite a different point of view, and proceeded to examine the spectra of the stars, to see if by that means he could classify them. Again photography had to be brought into requisition, for it was quite impossible to examine and measure the spectrum of a star with the human eye with sufficient accuracy. The spectrum of a pin point of light, such as would be given by a star in a properly adjusted moving telescope, produced such a fine spectrum line as to be almost useless for measuring purposes, but, if the spectrum were taken in a stationary telescope, a number of the fine spectrum lines would be obtained close together, which would form a band of spectra, which could be easily read and examined. There were, of course, other ways of obtaining the spectra of the stars, but there were none so simple or so free from error as this, and it was now generally adopted.

On looking at the spectra of the 276 stars, the most remarkable thing was that many were so alike, for, considering the number of elements, the natural supposition would be that there would be great variety. He would first call their attention to those stars which showed the lines denoting hydrogen in a high state of incandescence covered by an outer film of the gas in a cooler condition. In these spectra were also to be

observed the distinctive line of gaseous helium, which gained its name from the fact that its presence was discovered in our sun before it was found on our own planet. Now, the spectrum of the Orion nebula also showed these special lines of hydrogen and helium, so that set of stars were called the Orion or Helium stars, and they numbered no less than 88. On looking out the position of these stars in the sky, it was found that 70 of them were actually in the Milky Way, while the other 18 approximated to it. This peculiar fact could not be due to chance, so an explanation had to be sought. Now, it was estimated that the breadth of the Milky Way was such that for the light of a star on one edge to reach a star on the other edge would take 245 years. If, then, we were in the centre of the Milky Way, it would be quite possible that some of the stars comprising it would appear to us to be in a different part of the heavens, though they were really in the same big plane. In this way the apparent different position of the odd 18 stars could be accounted for. It was this theory, suggested by the peculiar position of the helium stars, which had altered our old ideas of the sky, and compelled us to believe that we were part of the Milky Way. Going back to the classification of the stars by means of their spectra, the next group were those in which calcium appeared and helium vanished. These were looked upon as older in age, because of the absence of the helium lines, and they were called the Sirius stars, because of their resemblance to the spectrum of Sirius. They were not so numerous as the first group. The next class approximated more nearly to the spectrum of our sun, and both of these last groups were distributed pretty evenly over the whole sky. It was for the wonderful discoveries he had described that the gold medal of the Royal Astronomical Society had lately been awarded to Mr. Maclean with acclamation. He hoped that his brief survey of the subject would in the future give the members of the Oxford Camera Club more interest in that great adornment of the sky, the Milky Way. He could not conclude without adding one word about that wonderful phenomenon, light, which contained two such incomprehensible attributes. The first was its faithfulness, the accuracy with which it carries its message from the far off stars to our own planet. The second was its actinic, which, in connexion with photography, enabled it to reveal its message to human reading. He would earnestly ask photographers not to look on light as their slave, but to remember that they were rather the servants of light, and as such should receive its message, and do their best to make it a source of usefulness and pleasure to mankind.

### LANTERN SLIDES BY CONTACT.

[Paper read before the North Middlesex Photographic Society.]

THE method of making lantern slides by contact from the negative, which I am down to demonstrate this evening, is very simple, and, if the directions which accompany each box of plates are carefully followed, you cannot go far wrong. Still, very often actually seeing the operation performed is of more use than instructions on paper.

Cleanliness is a *sine-quâ-non*. The negative must be well dusted, and so must the lantern plate. Pinholes and dust marks will spoil any slide, and are more noticeable in the slide than in the negative. Slides are not often made by contact from other than quarter-plate negatives, but occasionally a piece out of a larger negative may be obtained that will make a satisfactory slide.

Choose a negative that will give a good print, either in P.O.P. or platinum. A too thin one will not give a satisfactory slide unless by dodging, neither will a harsh one. With regard to exposing, if you are using any of the commercial plates for black tones, you can either expose to a gas jet or use magnesium ribbon. Ilford special will require about twenty seconds twelve inches away from a gas jet, or one inch of magnesium burnt at six feet distance. Thomas's will require about three times as much, Cadett about twice, Barnet about half, Paget slow the same. The speed of the various plates varies considerably, as you see, and it is advisable to stick to one kind (they are all good), and you will spoil much fewer than if you change from one brand to another. As to the developer, if you make up from the formula given, you will get good results, but a pyro developer, preserved with sulphite or metabisulphite, will give as good with most, if not all, the plates. It tends to give a warm black tone, as opposed to metol-amidol or hydroquinone, which give a grey-black tone with short exposures.

Warm tones may be obtained by simply increasing the bromide in the developer, and giving a correspondingly longer exposure. Some plates are more amenable to the action of KBr than others.

Fix in clean hypo, four ounces to pint, and, if veiled at all, immerse in a weak Howard Farmer's reducer until cleared.

I will just touch on the method of putting in clouds. Personally I always have them on another plate, and use that as a cover glass. Care must be taken, if this method is used, that the clouds are the same tone as the view. One method is to expose a plate behind a cloud negative, shielding the lower portion, develop and fix. Place the view and the cloud slide glass to glass, and eat away the portion of the sky where it overlaps the landscape with a strong reducer (Belitzki's or Howard Farmer's), using a tuft of cotton-wool as a mop. The action of the reducer vignettes off the cloud portion, and it must be allowed to slightly overlap the landscape. (Example shown.)



When the slides are washed and dried, place them film to film; no junction will be visible. Another method, if you use film negatives, is to place in the printing frame a clean sheet of glass, then the slide to which it is desired to add a sky, gelatine side up; the film sky negative is placed above this, and lastly the lantern plate. Great care must be taken that the lantern plate is exactly above the slide containing the view, otherwise they will not coincide when it comes to binding them up. (Example shown.) After development, dissolve away the lower portion below the horizon, which may have printed through the landscape, with Howard Farmer's reducer.

(This method has not much to recommend it, owing to the difficulty of registration, and is only suitable when there is a strong horizon.)

Appended is a table of exposures and developers used for getting warm tones by increasing the exposure and potassium bromide in developer, the slides being shown to the meeting:—

#### ILFORD LANTERN PLATES.

##### Negative Brilliant.

###### No. I.

Exposure, one inch magnesium; distance, six feet.

##### Developer.

Pyro (to ounce) .....	2 grains.
KBr (to ounce) .....	1 grain.
Carbonate of soda (to ounce) ..	22 grains.
Sulphite of soda (to ounce) ..	22 "

Time, about three and a half minutes; temperature, 70° F.; result, black.

###### No. 2.

Exposure, one inch magnesium; distance, three feet.

##### Developer.

Pyro (to ounce) .....	2 grains.
KBr (to ounce) .....	4 "
Carbonate of soda (to ounce) ..	22 "
Sulphite of soda (to ounce) ..	22 "

Time, about five minutes; temperature, 70° F.; result, brown-black.

###### No. 3.

Exposure, three inches magnesium; distance, three feet.

##### Developer.

Pyro (to ounce) .....	2 grains.
KBr (to ounce) .....	8 "
Sulphite of soda (to ounce) ..	22 "
Carbonate of soda (to ounce) ..	22 "

Time, about seven minutes; temperature, 70° F.; result, warm brown (Pages), brown (Ilford). J. TAYLOR.

#### THE STREET CINEMATOGRAPH.

##### PRISONERS COMMITTED.

ALFRED JONES, 23, and Samuel Gold, 18, showmen, of Graham-road, Dalston, were charged on remand at Southwark Police-court, on September 29, before Mr. Taylor, with being concerned together in causing a crowd to assemble in Southwark Park-road on the 22nd ult., and with using indecent and obscene language to the annoyance of inhabitants and passengers.

Evidence was given at the previous hearing by Detective-officers Lee and Brown, that the prisoner Jones was exhibiting a cinematograph on a barrow in the roadway, surrounded by a crowd of lads, and that Gold was describing in vile language the scenes exhibited, and which could be viewed at a charge of a penny. One of the films was produced in court, together with some pictures of nude figures, which were openly displayed. The magistrate ruled that these were classical subjects, but expressed an opinion that the exhibition of the film, in conjunction with the language quoted, was grossly and abominably indecent. He therefore decided that the prosecution ought not to be restricted to the language used, but should be extended to the exhibition itself. Mr. Sims now appeared to prosecute on behalf of the Treasury; Mr. T. W. Moore defended the prisoner Jones; and Mr. Mathews (for Mr. Sydney) watched the case on behalf of Haydon & Urry, Limited, of Islington. The police authorities were represented by Detective-inspector Freeman, M. Division.

Mr. Sims stated that the Director of Public Prosecutions had carefully considered the facts of the case, and had instructed him to ask for the committal of the prisoners on a common-law misdemeanour for exhibiting an indecent exhibition. He thought there could be no doubt that such an exhibition in a public place was a common-law offence.

The Magistrate: It seemed to me to be perfectly clear.

Mr. Sims said he had had to see the film, and he thought there could be no question of the real nature of the exhibition, especially when coupled with the language used by the prisoners. He suggested that, before proceeding with the evidence, women should be ordered out of court. There was only one woman present in court—a tall, elderly female, fashionably dressed in grey, and she reluctantly left the court.

Evidence similar to that given previously having been called, Mr. Moore, on behalf of his client, submitted that the film was not indecent, and stated that the photographer was awarded a medal for it at the Reading Exhibition.

The Magistrate expressed his surprise, and asked who were the Judges.

Mr. Moore did not know, but proposed to put Mr. Haydon in the box.

Mr. Sims: Before you do that, I think Mr. Haydon should be cautioned as to his own position.

Mr. Mathews: As representing Mr. Haydon, I should advise him not to go into the box.

The Magistrate: I think you are exercising a very wise discretion.

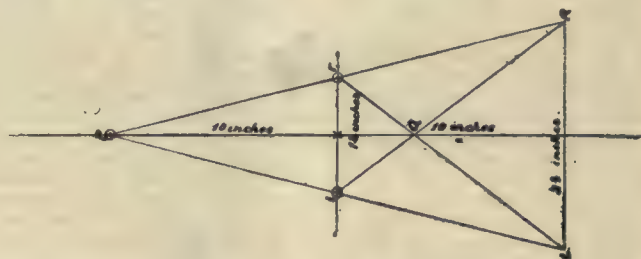
The prisoners were then committed for trial, and an application to reduce the amount of bail from 100*l.* each was refused, and the prisoners removed.

#### USING THE EYES AS A STEREOSCOPE.

MR. L. PAXTON, in the *English Mechanic*, gives the following method of obviating the use of a stereoscope in the examination of binocular photographs:—

Supposing *n* and *l* to be the position of the eyes, *r*, *d*, *l*, two pins stuck upright and a third pin stuck in at *p*, it is evident that, looking with the right eye, the pin, *r*, will appear to cover the pin, *p*, and, looking with the left eye, the pin, *l*, will do the same.

On looking with both eyes, slightly squinting, the heads of the pins will appear to unite at that point, and, if small stereoscopic pictures, the centres of which are  $1\frac{1}{2}$  inches apart, be substituted for the pins, they, in like manner, appear to unite at 10 inches behind the stereos. As the size of the stereo prints increases, the distance at which they unite also increases, and the necessary amount of squint becomes less, till with the full-sized pictures  $2\frac{1}{2}$  inches between the centres, a very slight inclination of the eyes is required, the natural accommodating power of the eyes



being sufficient to cause them to unite. They seem, in fact, to coalesce without effort.

Pictures taken with the lenses of the camera the same distance apart as the eyes give the least trouble to unite, as one sees the pictures under the same aspect as the objects they depict.

I have shown at *q* in the diagram the effect of uniting the pictures in the way mentioned by "R. S. D." It will be seen that the amount of squint requisite is greatly in excess of the way I described, and more trying to the eyes.

I know that some people find a difficulty in uniting the pictures; but, on the other hand, many do so quite easily. I have photographed and mounted a very great number of stereos during the last forty years by the method described, and have never found any trouble in doing so. I recently looked at the stereoscopic pictures in the *Royal Magazine* without a stereoscope, and, with one exception, had no difficulty. Some of them were excellent—much better than I should have thought possible from mechanical printing.

#### ACETYLENE GAS-GENERATORS.

At the Congress in connexion with the Acetylene Exhibition held at Budapest last May, Dr. Ludwig read a paper on gas-generators, which is thus reported in the *Engineer*: He gave an account of the progress that had been made in the construction of gas generators during the past year. After a brief but courteous acknowledgment of the huge debt which generator-manufacturers, in Germany, as in this country, owe to Professor Lewis, for his careful experiments on the theory and practice of acetylene production, he began by dealing with carbide-to-water apparatus. Ludwig remarked that the mechanism employed to feed the carbide as required into the water had been greatly simplified, and in most recent forms was fairly trustworthy; but, as it was usually driven by the rise and fall of the holder-bell, this method of procedure had the defect of throwing considerable and undesirable work on the gas-holder, which work, moreover, was apt to vary as the general store of carbide decreased in weight. Carbide-to-water generators were therefore more suited for hand charging, and as such were indicated primarily for installations where a man would be in constant attendance. It will be within the recollection of most readers that Professor Lewes has stated that the output of gas per unit weight of carbide in apparatus of this type rarely exceeds eighty-four per



cent. of the proper amount—a loss which he ascribed partly to imperfect decomposition of the carbide and partly to dissolution of the acetylene in the large excess of water. Unfortunately he has not given any estimate of the relative magnitude of these defects; but, it seems clear that, by proper construction of the generator, imperfect decomposition should be capable of almost complete elimination, for the usual source of this trouble depends on the fact that some of the smaller fragments of carbide fall through the false bottom—when one is fitted—and become coated with a resistant layer of lime sludge. Ludwig did not mention this latter objection, possibly because he considered it had already been overcome in the goods of the best makers; but, referring to the loss of acetylene due to dissolution, he stated that a carbide-to-water generator would work with one gallon of water per 2 lbs. of carbide—a volume which could only absorb two per cent. of the acetylene, assuming the theoretical yield to be 5 ft. per pound. On the large scale the lime sludge might be drawn off, the solid matter allowed to settle, and the liquid returned to the generator, thus decreasing the waste of gas; in smaller apparatus it would be more convenient and cheaper to bear with the loss. Another trouble met with in these generators was the foaming that occurred with certain brands of carbide; and he suggests that this was caused by the use of a material containing aluminium. Aluminium carbide evolves methane on treatment with water; and methane in lime water, he said, always foamed. Experiments with oils, salts, &c., instituted to discover a means of avoiding the difficulty, gave negative results.

Among water-to-carbide generators improvements had been even more pronounced. When the total charge of carbide contained in the apparatus was distributed among a large number of small compartments, and the water was admitted in such fashion that it could only reach one portion at a time, and when the quantity of water admitted each time, some entering the decomposing chamber, was more than sufficient wholly to decompose each portion of the carbide, then water-to carbide machines worked quite as well as those of the opposite construction. The system of permitting water to fall either in drops or as a stream on a mass of carbide was being abandoned; for apparatus of this design were specially liable to excessive heating, accompanied by the inevitable decomposition of part of the acetylene, while they also had the defect of leaving some of the carbide unattacked. This incomplete reaction was not merely wasteful, but was actually likely to prove dangerous if the residues were dealt with carelessly. However, generators of this type, in which the carbide was subdivided into small portions like those previously described, were still being manufactured, and it remained to be seen how they would compete with their rivals. In short, Ludwig's remarks only bear out those made by other observers, viz., that to obtain satisfactory generation, to avoid excessive heating and consequent polymerisation, water must always be in excess at the time and place of actual chemical reaction between the two substances.

Ludwig considered that portable lamps had been improved, but were still far from perfect; that methods of purification were satisfactory, and that, if they were employed, burner troubles would no longer exist. Purification with liquids ensured greater regularity of action than when the same reagents were used as solids, but the former method involved more loss of pressure. When the gas was to be dried again after purification, lime was better than carbide, but precautions must be taken to prevent dust passing into the pipes. In connexion with this latter opinion, it may be remarked that a highly purified acetylene has practically little odour, whereas an evil-smelling gas is, remarkable though it sounds, advantageous, in view of the fact that leaks are more safely detected by the nose than by a disastrous explosion. If the pure but damp acetylene be dried by carbide, the gas is scented again, and it would seem the proportion of impurities thus introduced might be sufficient to make it smell without causing it to be objectionable in other respects. This is a matter, perhaps, on which further experience is desirable before a final judgment can be delivered.

### IMPROVED MUTOSCOPES, &c.

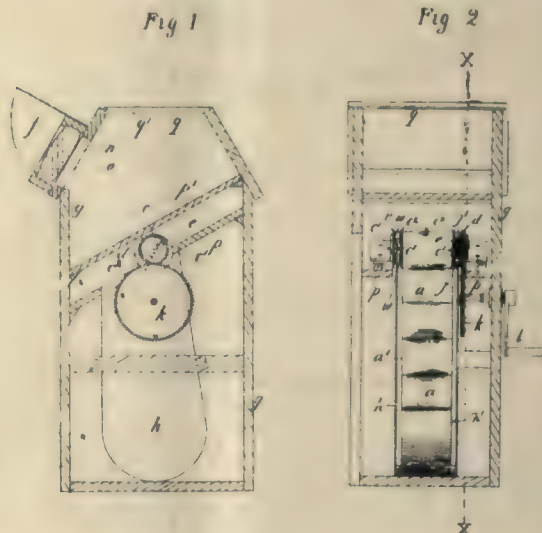
ANSBORO AND FAIRIE'S.

In this invention, which is due to Messrs. Ansboro and Fairie, the series of pictures, *a*, to be presented to the eye are arranged in the form of an endless band, *a'*, each picture being jointed to its neighbour in the band by means of a flexible joint, *b*. The flexible joints are coated alternately, on opposite sides, that is to say, the one joint is coated on the one side of the band, and the next joint on the other side, with an elastic substance, such as indiarubber, so as to give the band a tendency to fold automatically in a V fashion, as shown at fig. 3. By means of a revolving plate, *c*, which receives intermittent motion from an eccentrically arranged wheel, *d*, provided with means, such as a pin, *e*, for actuating the plate, each picture is presented before an eyehole, *w*, in the case, *g*, of the instrument for a brief interval of time, and is then suddenly turned over, and its place taken by the next succeeding picture in the band. As the pictures in the band fall down from the plate, *c*, aforesaid, they fold up automatically (see dotted lines, *i*, fig. 3) within a guide casing or chamber, *h*, which is preferably of a U shape, with a central division or partition, *h'*.

The revolving plate, *c*, has its axle, *c'*, to which it is rigidly secured,

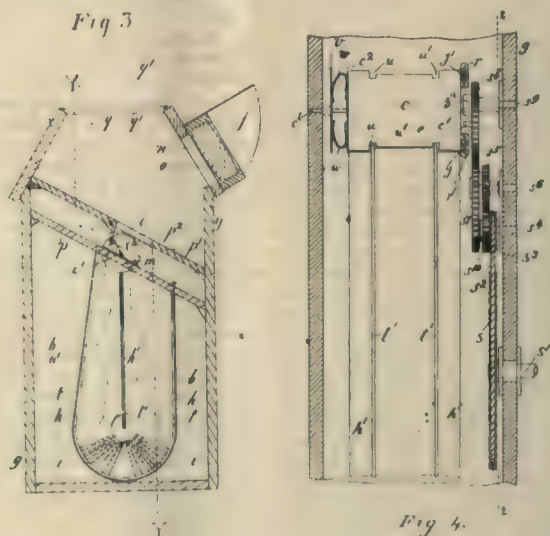
carried by the brackets, *m*, and, as will be clearly seen from fig. 1, the said axle, *c'*, is out of the centre of the wheel, *d*; the result of this is that, as the wheel revolves, its projecting pin, *e*, alternately engages itself with, and releases itself from, the projections, *j*, *j'*, provided for the purpose, on the plate, and which are equidistant from the centre of its axle so as to impart to the plate the intermittent motion. The wheel, *d*, can be kept continuously in motion by means of suitable mechanism such as the gear wheel, *k*, operated by the turning of a handle, *l*, or by clockwork.

The pictures can be viewed through a single opening, *n*, provided with a magnifying lens, *o*, or, when the series of pictures in the band are in



duplicate, they can be viewed stereoscopically through two openings, one for each eye.

*p* is a strengthening cross board, to which the casing, *h*, can be secured at its upper end. *p'* is a cover with an opening, *p''*, at the centre, through which the pictures can be seen as they are presented by the plate, *c*. *q* is an opening at the upper end of the instrument, and which is provided with a hinged lid, *q'*, capable of being raised to the proper angle (see dotted lines, fig. 3) in order to serve as a reflector for throwing light upon the pictures.



For the purpose of keeping the pictures in place as they are revolved, the plate is provided at each end with metallic discs, *c''*.

In the arrangement figs. 4 and 5, the plate, *c*, mounted rigidly on its axle, *c'*, has its projections, *j*, *j'*, provided with escapement pieces, *r*, *r'*, each of which is slotted and is capable of being adjusted in position upon the projections by means of the screws. The mechanism for revolving the plate consists of a driving pulley, *s*, on the axle, *c'*, and from which passes a cord, *s'*, to the small pulley, *s''*, on the spindle, *s'''*. Made in one with the pulley, *s''*, is a toothed wheel, *s'''*, which gears with a toothed wheel, *s''''*, on spindle, *s'''''*, made one with an elliptical wheel, *s''''''*, which



latter gears with the elliptical wheel,  $s^8$ , turning upon the spindle,  $s^9$ . The pin,  $e$ , inserted in the elliptical wheel,  $s^8$ , is capable of engaging once in each revolution with one of the escapement pieces,  $r, r^1$ . As will be seen, the axle,  $c^1$ , of the plate,  $c$ , is journaled at the one side in the head,  $s^{11}$ , of the fixed spindle,  $s^8$ , and eccentrically of the wheel,  $s^8$ . As is clearly shown at figs. 6 and 7, owing to this eccentric arrangement, the pin,  $e$ , will be caused, once in each revolution of the wheel,  $s^8$ , to engage one of the escapements (see fig. 7), with the result that the plate will be turned over, that is, moved through half a revolution, and then release itself from the escapement and pass round free of the other escapement (see figs. 4 and 6).

As the movement of the pin,  $e$ , in its path, is faster or slower, according as the longer or shorter radius of the wheel,  $s^8$ , is in line (through the gearing of the wheels) with the shorter or longer radius of the wheel,  $s^7$ , the pin and these variable movements are so arranged that the former will be engaged with the plate,  $c$ , during its maximum movement, and released therefrom when its movement is at a minimum, thereby ensuring that each picture, as it is moved forward in succession by the

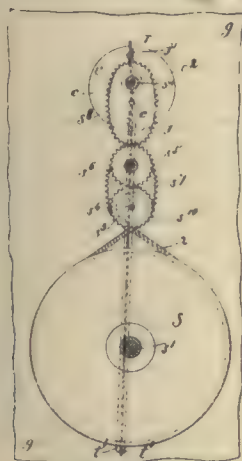


Fig 5

plate, shall remain at rest for a much longer time than is taken to effect the change from one picture to another.

In order that the friction on the flexible joints, due to the movement of the band, may be reduced to a minimum, the band, in its path of movement, rubs merely against two wire rails,  $t, t$ , arranged around the interior of the chamber,  $h$  (as shown at fig. 3), at a distance apart corresponding to that between the two deep indents,  $u, u^1$  (fig. 4), on each edge of the picture plate,  $c$ . The middle partition,  $h^1$ , of the chamber,  $h$ , is similarly furnished, and both its wires,  $t^1, t^1$ , are prolonged at the top into the indents on the edge of the plate, so that the plate, in revolving, passes by them like a comb, without actually touching, and so prevents any possibility of the band being caught during its movement between the upper part of the partition and the edge of the plate.

To facilitate the movement of the band from front to rear, at the bottom of the chamber, the latter is there formed with a curve that may be either circular or cycloidal.

$w, w$ , are bent springs attached to the disc,  $c^2$ , of the picture plate, and which bear against the fixed disc,  $v$ , so as to act as brakes.

CHARLES RALEIGH'S.

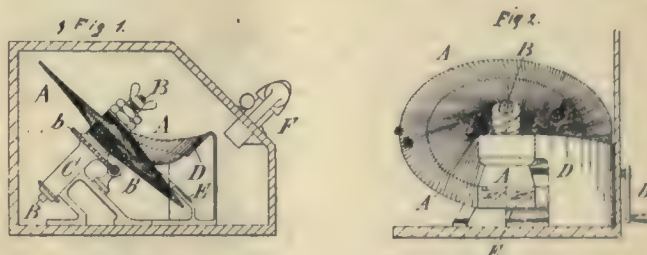
The inventor, Mr. Charles Raleigh, points out that, in mutoscopes as hitherto constructed, it has been usual to arrange the pictures on flexible arms, which project radially from a common centre. In the circular path traversed by the pictures, or by the arms carrying the latter, a stop is presented which has the effect of temporarily arresting the movement of each successive picture whilst in the line of vision.

The continuation of the rotative movement has the effect of liberating each picture and allowing it to resume its normal and radial position. According to this method of working, the bending of the pictures, or of the arms on which they are carried, provides but an extremely limited surface for the arresting stop to engage with, the consequence being that, unless the pictures are mounted with great accuracy, there is a liability for more than one picture to disengage itself at a time, the regularity in the apparent movement of the object being thereby marred.

According to his improved method of construction, instead of arranging the pictures radially or upon arms, so that, on arriving in position for observation, they travel in a direction at right angles to their surfaces, he mounts them in such a manner that, in travelling towards or away from that position, they move edgewise, or substantially in the plane of their surfaces. On reaching a certain point in their journey, they arrive

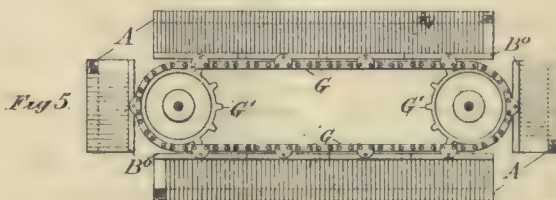
against a curved guide, so arranged as to gradually deflect them laterally to an angle of from sixty to seventy degrees or thereabouts. On passing beyond the curved guide, they are successively released, and, straightening out, resume their normal attitude.

In mounting the pictures, they are arranged each with its edge slightly



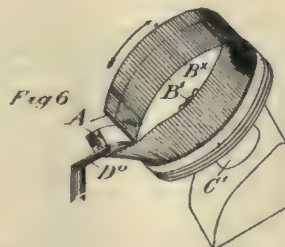
in advance of that of the following picture, the extent to which each picture is in advance being permissible considerably more than is practicable with mutoscopes as ordinarily constructed and worked.

In the accompanying drawings, fig. 1 is a view of a mutoscope having the pictures arranged according to my improved method. Fig. 2 is a face view, the front portion of the casing, which is furnished with the lens for viewing the pictures, being removed. Fig. 3 is a diagrammatic view of a number of picture cards mounted in the manner illustrated in figs. 1 and 2, but arranged spirally upon the spindle. Fig. 4 shows in side elevation and perspective another method of mounting the pictures, whereby they are arranged parallel with, and so as to overlap, each other. Fig. 5 illustrates a method of working where the cards are



mounted as in fig. 4, and arranged in sections upon an endless carrier. Fig. 6 is a perspective view, showing a number of pictures mounted parallel with and so as to overlap each other and arranged upon a circular foundation.

$A, A$  are the overlapping picture cards or arms, which are mounted upon the spindle,  $B$ , the latter being carried in the bearing,  $C$ . Motion may be imparted to the spindle,  $B$ , by means of the handle,  $b$ , through the medium of the worm,  $b^1$ , and worm wheel,  $b^2$ .  $D$  is the curved guide by which the



picture cards are deflected laterally, and allowed to descend upon a stop,  $x$ , in position for being viewed through the lens,  $r$ . The picture cards or arms may be rectangular or wedge shaped in plan.

According to an alternative mode of mounting, shown in the diagram (fig. 3), the picture cards,  $A$ , are arranged in the same manner as in figs. 1 and 2, that is to say, each with its edge slightly in advance of that of



the following picture, but the series of pictures are placed on the spindle, *n*, in the form of a spire. When mounted in the machine, each picture is deflected by the curved guide, *v*, and received on the stop, *x*, as explained with reference to figs. 1 and 2.

The series of picture cards may be arranged to work rectilinearly, as shown in figs. 4 and 5. In fig. 4 is illustrated a series of picture cards, *a*, mounted on an endless band or carrier, *n*<sup>0</sup>, each card being arranged with its edge slightly in advance of the one immediately following. In fig. 5 the same method of mounting and working pertains, but the picture cards, *a*, are arranged in sections, the section with their carriers, *n*<sup>0</sup>, being mounted upon an endless chain, *c*, which may be operated by the chain wheels, *c*<sup>1</sup> *c*<sup>2</sup>. The picture cards may be mounted on an endless band, arranged to pass round one or more guide rollers.

Or the series of picture cards, arranged as above described, may be mounted so as to follow a circular path, as shown in fig. 6, in which the series of overlapping picture cards, *a*, are mounted upon a circular plate or boss, *n*<sup>1</sup>, the latter being keyed on a spindle, *n*<sup>2</sup>, carried on suitable bearings, *c*<sup>1</sup>, operated by means of a crank handle and worm gearing as described with reference to figs. 1 and 2. A guide or projection, *n*<sup>3</sup>, is mounted in the casing of the machine for deflecting each picture card in succession, so as to bring the same to the position for observation.

### THE "LABORATORY" LATHE-BED LANTERN.

This new lantern has been designed by Messrs. Newton, 3, Fleet-street, specially for scientific work in laboratories and lecture theatres. It consists of a ribbed aluminium body carrying a 4½ inch condenser, mounted on a solid, accurately planed lathe-bed, base 3 feet long, on levelling screws.

The focussing lens and slide-carrier are carried on separate standards, and both they and the lantern will slide and clamp in any position on the "V and flat" iron bed. There is a clear space of about 14 inches between the optical centre and the table on which the lathe-bed stands, thus allowing ample room for physiological recording apparatus, &c., for which this form of base gives ample facilities. The whole instrument, being constructed of metal, is very rigid and free from vibration, and is not affected by the heat of the arc light. It is, of course, not very portable, though it can easily be carried from one room to another. As the fittings are all readily removable, the base can also be used as an optical bench for laboratory work, where accurate centering and motions and easy interchange of apparatus are requisite.

### SPEARLING'S CHILDREN'S OPAQUE LANTERN.

This lantern has been designed by Mr. Spearling solely with the object of showing opaque objects and pictures on the screen.

The whole of a drawing or painting, five inches square, can be shown five feet in diameter on the screen with sufficient illumination for a small audience.

Flowers, shells, the face and works of a watch, coins and curios of various sorts, can also be well exhibited.

It is fitted with two incandescent gas burners, which only require ordinary house gas brought to them, by an indiarubber pipe from the nearest gas bracket. It is therefore absolutely safe, and requires nothing but turning on the tap and lighting, and is at once ready for use. At the back of the lantern can be attached a double roller, carrying a roll of paper on which children can make drawings and paintings, which can then be projected as a moving panorama on the screen. Christmas cards, butterflies, and similar objects show excellently. The instrument has been put on the market by Messrs. Newton & Co., 3, Fleet-street, London.

### THE "GASLYT" LANTERN PLATES.

J. J. Griffin & Sons, 20-26, Sardinia-street, Lincoln's Inn-fields, W.C.

Messrs. GRIFFIN are introducing the Gaslyt lantern plates, the name of which indicates the fact that, like Velox, all manipulations, from the removal of the plate to the final development and fixing, may be conducted in gas or lamp light, no dark room being required. Messrs. Griffin say: "Amateur photographers of the old school seem to view with some misgiving this growing independence of such an ancient institution as the dark room, but we venture to believe that the majority will gladly sacrifice the darkness, the discomfort and unhealthiness of the ruby lamp or the comfort resulting from the new methods. The property of being able to develop Gaslyt lantern plates in a brighter light is of particular advantage to the tyro, as he can judge the density with every certainty, a difficulty which all experienced lantern-workers will affirm."

The following are the instructions for working the Gaslyt lantern plates:—

**Exposure.**—With a negative of average density, employing an ordinary gas flame as the source of light, from one and a half to two minutes, at a distance of four inches, will be found to be sufficient. If warm tones are preferred, the exposure must be more prolonged. To

secure the best results the use of magnesium ribbon as an illuminant is recommended. By burning one inch of ribbon at a distance of eighteen inches from the negative splendid black tones may be obtained. When using a thin negative, the distance should be increased. For sepia tones, use three inches of magnesium ribbon, and, for warm brown tones, four inches at the same distances from the negative.

**Development.**—After exposure, develop with the following. For this purpose, you need not have a dark room, but can conduct your operations at a distance of six feet from an ordinary gas flame or lamp light.

#### FOR BLACK TONES.

Water .....	8 ounces.
Metol .....	4 grains.
Sodium sulphite crystal .....	75 "
Hydroquinone .....	16 "
Sodium carbonate crystal .....	280 "
Potassium bromide .....	16 "

#### FOR WARM OR SEPIA TONES.

Solution (as for black tones) .....	1 ounce.
Water .....	2 ounces.
Potassium bromide solution (ten per cent.), 10 drops, or 1 grain of the solid substance.	

With the above developer, assuming exposure to have been correct, development should be complete in about two minutes for black tones; development for warm tones is complete in about four minutes.

**Fixing.**—On completion of development, the plate should be immersed, without previous washing, in an acid fixing bath, where it should remain for about four minutes. Griffin's Rapid Fixer, or the acid hypo fixer in cartridges, form, when dissolved in water, according to instructions, are excellent baths for the Gaslyt plates. The following formula may also be used:—

#### STOCK SOLUTION.

Sulphite of soda .....	4 ounces.
Citric acid .....	½ ounce.
Water to make .....	20 ounces.

To prepare the fixing bath dissolve—

Stock solution (as above) .....	6 drachms.
Soda hyposulphite ... ..	4 ounces.
Water .....	20 "

**Washing.**—Half an hour's washing in running water is sufficient.

#### CAUSES OF FAILURE AND THEIR REMEDY.

**White Deposit** all over the film is due to milky hypo bath or imperfectly filtered tap water. Use a small piece of wet cotton-wool, with which wipe the film.

**Black Specks** on surface of film may be also removed by the above method. It is, in fact, a good plan to make a practice of wiping each plate during the final washing, thus avoiding the risk of permanently disfiguring the slide.

**White Spots** on finished work may be caused by dust specks on negative during exposure. Wipe carefully both lantern plate and negative before printing. Pour developer evenly over the film.

**Greenish or Brownish Blacks.**—Too much bromide in developer; weak or spoiled developer; over-exposure.

**Fogged or Veiled Results.**—Exposure to too strong a light previous to development. Avoid direct gaslight.

**Lack of Contrast.**—Over-exposure or too thin a negative. Cover negative with a sheet of tissue paper, and give short exposure, nearer to source of light.

## Correspondence.

### HOW A LENS IS MADE.

To the Editors.

GENTLEMEN,—I shall esteem it a favour if you will kindly announce to your readers that I have an interesting set of forty slides, entitled "How a lens is made," which I shall be happy to place at the disposal of secretaries of photographic societies.

The slides illustrate the various processes of manufacture as carried out in the optical factory of Mr. C. P. Goerz at Berlin-Friedenau. A complete description, for the use of the lecturer, accompanies the slides, and I think the subject would form an interesting item upon the syllabus during the winter season.—I am, yours, &c.,

4 and 5, Holborn-circus, London, E.C.  
September 29, 1899.

PAUL PONGE.  
(Pro C. P. GOERZ.)

FROM Messrs. Morley & Cooper, of 70, Upper-street, Islington, we have received their list of high-class English-made hand cameras, also their lantern catalogue, with list of accessories, sets for hire, &c.



## MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."]

[November 3, 1899.

# THE LANTERN RECORD.

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### LANTERN MEMS.

At the Camera Club recently, some beautiful examples of three-colour printing in transparencies were projected on the screen as illustrations of a most interesting lecture and demonstration by Mr. Sanger Shepherd. For brilliancy of colour, accurate register of films and fidelity to nature it can fairly be said they were *par excellence*, and, if as stated, no great skill is required to produce them or an expenditure of unreasonable time, there should be a great future before this process. The lecturer stated he was indebted to Mr. Saville Kent for the negatives from which he obtained some of his most brilliant results, notably the butterflies, Australian flowers and foliage, but the reproduction of a picture with a bay-coloured horse pleased the audience immensely.

Those who had seen demonstrations by the Ives process, examples of the Joly method, and the specimens shown at the Society of Arts and Crystal Palace of Bennetto's work, could not but admit that these slides, which Mr. Sanger Shepherd said he produced himself on the day of the lecture, were the closest approximation to the colours of nature of any of them, and as lantern slides the most practical, for only an ordinary lantern is required, and there are no lines, overlapping of colour, or anything that, as far as could be then seen, could be taken exception to, notwithstanding they were critically viewed through an opera glass.

The new American film was credited with giving assistance to this end, and the aniline dyes used to colour the three transparent films were produced after considerable trouble, for ordinarily the scum or impurities contained in commercial dyes prevented satisfactory results. The inevitable syndicate is formed to exploit the method for which the two gentlemen named are responsible, and, if an average worker can produce results at all approximating to those shown, there should be money in the scheme.

I NOTE that the biograph has gone to the war, and, if anything in the way of a battle piece is possible, Mr. Dickson, the gentleman in charge, is just the man to secure it. As money is no object with a Company such as this, and the technician mentioned is a man full of resources, the British public will, no doubt, through the medium of

the instrument at the Palace Theatre, be treated to some most interesting episodes. I can understand a satisfactory portrayal of a battery getting into action, galloping to a position, unlimbering, taking the range, firing, and perhaps limbering up and retiring, also the preliminaries of a gallop and charge by cavalry; but, when it comes to the actual fight, then the distance dictated by prudence, if not insisted on by the general in command, will preclude anything like a near enough approach to the scene to get a presentable picture except by long-focus lenses, say, twenty to thirty inches. Equivalent foci are used, for with ordinary lenses the photograph will only be a microscopical reproduction of the scene. I have often witnessed military manoeuvres and sham fights, and should have liked to portray what the eye sees, but the camera of ordinary make, with lenses of moderate length of focus, is quite unequal to the task. Mr. Dickson may be equipped differently to what I suppose for his biograph camera and so upset my conclusions. Any way, I know he has with him cameras other than the biograph, so perhaps he may obtain some set scenes as well as animated.

I MUST congratulate Messrs. Wilson & Son on the very comprehensive way they have gone to work over a subject that is always of interest to lovers of art, and have prepared for portrayal in the optical lantern a set of no less than one thousand slides of Italy, embracing the chief cities and places of historical or artistic interest, paintings by the old masters, statuary and sculpture, &c. Art and science teachers have here at their command a splendid choice of illustrations for their lectures, while travellers and tourists can supplement their own photographs with pictures and examples of art that they themselves would not be able to obtain during a holiday limited for time. Their idea of an album of miniature photographic prints of these subjects is a very good one, and enables intending customers to see, and therefore understand what the subject is like, which, of course, cannot be done from a title only. The principal opticians, lantern-makers, and slide dealers keep this album for their customers' inspection, or to send them on application for a limited period, so that the customer may choose for himself, and, unless he is very exacting in his requirements, he will be able to make a selection that should add materially to the value of his collection of slides, besides giving him the power to illustrate the particular points in his lecture he wishes to emphasise. Mr. Wilson's short *resumé* of English history hardly justified the adjective, for already it is so long and means so large a collection of slides that it is only the very large dealers that would stock them all. This does not, however, detract from their merit or neutralise their usefulness for educational work.

THE martial spirit of the nation just now is exemplified at every public meeting and place of entertainment, and those who have negatives of the "Soldiers of the Queen" are reaping a rich harvest both for lantern slides and illustrations for journalism.

G. R. BAKER.



## MY EXPERIENCES OF "SPIRIT PHOTOGRAPHY."

The experiences of Mr. Mark Blow, of Sydney, N.S.W., given in a recent issue of this JOURNAL, recall very vividly to my memory the many hours, cash, and material I have wasted in my fruitless endeavours to get even the ghost of an image of a "ghost" on a sensitive plate. For many years I have been deeply interested in so-called spirit photography, and my first experiments in that particular direction were made a few months before the late Mr. J. Traill Taylor gave to the world his famous paper on the subject, in the month of March, 1893 (see THE BRITISH JOURNAL OF PHOTOGRAPHY, March 17, 1893). At the time when the *Fortnightly* (January, 1893) was published containing an article on "Ghosts and their Photographs," by the Rev. H. R. Haweis, M.A., I was living within a stone's throw of a then, and perhaps now, well-known "circle," in the Camberwell New-road, S.E. The man with whom I lodged, though not a professional medium, was a member of the circle, and one of those individuals whose good (or bad?) luck it was to see spirits at all times (he, by the way, was a builder by trade, and not a publican). Here, then, was my opportunity for experiment. Somehow or other I had not the nerve in those days to attend dark sciences and spiritualistic manifestations, such things were all new to me, for I was one "from the country," and scarcely of age. By degrees, however, I mustered up courage, and as a beginning we had little sittings in the parlour.

The name of my friend was Harris, and he was quite as anxious as myself to obtain pictures of what he, and he alone, saw. Moreover, he shut himself up in the darkened parlour one evening with my camera focussed ready, six double backs, and a plentiful supply of magnesium ribbon and a flash lamp. For three hours he sat there and did not speak, but exposed my twelve plates by aid of magnesium whenever he saw a psychic form in the room. I developed most carefully six of those plates in six different ways, and sent the remaining six to as many professionals. All produced the same result—nothing, except, of course, the wall paper, curtains, &c., that were in the room. Not a trace of a spirit form could we find. My friend was disappointed, so was I, for he assured me most emphatically that figures were seen, and, what is more, they stood still while the ribbon burned or the powder flashed.

After hearing Mr. Taylor's lecture, we decided to try again with faster and isochromatic plates. We did so, and on this occasion I remained in the room the whole of the time and manipulated the camera and lights whenever my friend said that spirit forms were about. Needless to say, I saw them not, but relied on the truthfulness of my friend. Again, and on two subsequent occasions, the same result—nothing.

I then made arrangements for the attendance of a professional medium; but, before I could proceed with further experiments, I was called away on business to Bradford, where I remained for some years, and never returned again to London to live. It was a fortunate matter that I went to Yorkshire, for, as almost every one knows, this shire and its neighbour, Lancashire, are the very hotbeds of spiritualism. I had not been in that district long before the thought of photographing "table-turning" parties occurred to me, and, under a *nom-de-plume* (K. N. Pepper), I wrote an article on the subject to *Photography* (November 8, 1894). In reply thereto three or four letters, wise and otherwise, appeared, but whether any one else took up this seemingly idiotic branch of photography I know not. I did, with a determination to get something. I attended many table-turnings, both by day and by artificial light, made some scores of exposures upon the unseen influences that were apparently at work, but my results were always the same—nil.

About this time the Bradford Photographic Society was formed, and it was at one of the meetings that I met a gentleman, well known in the photographic world, who I will now call Mr. Smith. I soon found out that what interested me also fascinated Smith, and we read and discussed together *The Veil Lifted*, *Twenty Photographs of the Risen Dead*, and a few other books. Finally we resolved to go into partnership in the matter and engage the best medium it was possible to get. From the preface of *The Veil Lifted* we got the following information: "The term 'spirit photographs' is generally used to describe photographs of psychic entities which cannot be seen by ordinary persons, but can be photographed by a medium, or with the help of a medium, and with the co-operation of these unseen entities. Such portraits are obtained both indoors and in the open air, with and without a background, by natural light and by artificial light, and in the case of 'materialised' forms at sittings, which are visible to every person present, the portraits have sometimes been taken by light produced by spirits, the exact nature of which is unknown."

Anent the latter statement, it is interesting to note that there appeared in these pages, and in the *Daily Telegraph*, a few months ago, an account of how a materialised form nearly lost his life by suffocation, and how the audience went to his help. They found the materialised form to be a living human being, who had accidentally swallowed the small electric lamp that had been placed in his mouth for the purpose of illuminating his face when he, the materialised form (*sic*), appeared before the audience. But let us for the nonce let such things slip.

I will name the medium that we obtained—Jones—Mr. Jones, of Leeds-road, Bradford. He was considered by all who knew him to be an excellent medium. I say excellent, because he told me that for twenty years he had never been "clear" of a spirit form; he met them in the street,

they were beside him while at meals, they walked round his bed, took tram rides with him, and did many other wonderful things. Such a man we prized, for he was indeed a treasure, and one we intended making the most of.

"Aren't you nervous and afraid to have these ghostly forms always pottering about round you?" I asked.

"Not at all," he replied, "I should be miserable if they were to leave me."

During our conversation I gathered that he knew absolutely nothing of photography, and that he was extremely anxious to sit for us as he felt certain, nay, was quite sure, that the astral bodies could not help being taken. Needless to say, neither I nor my friend Smith could see our uninvited guests, so we were content for the nonce to believe Jones, as they were visible—very plainly, too, he said—to him alone.

"As I cannot see the forms," I asked, "perhaps you will tell me their colour?"

"Certainly," he replied; "they are a misty light blue, a kind of a hazy, airy form."

"That being the case," I said, "they are certain to be photographed," because light blue, as every one knows, photographs white.

We adjourned on that particular bright Sunday afternoon to Smith's quiet parlour, situated in the Lister Hills district of Bradford. We draped the room with deep red and black curtains, for reasons that are obvious to all who know anything of photography.

We fixed up our cameras, focussed the curtains, and made a few exposures on the empty room. Our plates came out of the developing operations like clear glass; not a ghostly form was to be seen on them, even though our spiritualistic friend declared there were some misty forms promenading on the carpet. Any way, we missed them.

Taking the medium by my side, I explained to him the angle of view my lens embraced, and begged that he would tell me when a spirit form was in the centre of the picture, at which moment I would expose. I said I preferred a female figure, if one should come, as I had been told that a spirit face is a realisation of a high ideal of beauty, the beauty of which we poor mortals cannot comprehend. The medium gazed for a few moments into the empty room.

"There, there!" he exclaimed; "there is one, a perfect angel!"

I made an exposure, and developed at once; but, alas! she left no trace even of a shadow behind.

As the next experiment, we sat the medium in the centre of the room and focussed him, "because," he suggested, "they may gather round me and stay long enough for you to make a much longer exposure."

After sitting a few minutes he said, very calmly, "There is a good-looking young female against my knee."

"Then take her on it, and hold her tight for a few seconds," I said.

But my suggestion seemed to annoy him, and I found I must work more seriously.

"There is yet another," he said, "behind my chair."

Both these visions stayed, so Jones said, long enough for me to give a longer exposure; but again the same result—nothing, except, of course, the medium, who sat there right enough, but he was alone, his female friends did not show themselves. We then had tea, and waited until the sun had set. Proceeded we then again to the parlour with a flashlight outfit. For upwards of an hour we sat in that darkened room, flashing magnesium and exposing plates whenever our friend, the medium, said we had misty visitors, but with no success whatever. We tried every possible means on that and other days and with other mediums for getting even a shadow of some ghostly visitors, but were doomed to disappointment.

I do not doubt for one single moment that mediums, indeed, spiritualists generally, do see psychic forms; anybody can see them if their minds are weak enough to be worked up to such a high pitch of imagination. Ghosts, as spirits are vulgarly termed, do not, I believe, exist in reality; they are simply brain pictures or day dreams of a pronounced type, and nothing more. If they really did exist, their misty forms could not escape the camera, for has it not been proved times out of number that things invisible to the naked eye can be successfully photographed?

RICHARD PENLAKE.

## LANTERN LECTURES.

WITH so many of our amateur associations organizing lecturette competitions for their members, and, judging from the keen competition that invariably follows, it looks as if a fresh impetus is likely to be given, not only to amateur photography, but likewise to single lantern work as well. That these competitions do much to assist secretaries and others in providing interesting matter for the winter season, as well as tending to improve the quality of amateur work, is at once recognised, but there is a further advantage accruing from such competitions, they are instrumental in bringing forward numerous individuals who possess undoubted literary ability, who otherwise would never dream of standing before an audience and delivering even a short address.

No doubt there are many persons who, from a feeling of nervousness, shrink from appearing on any public platform who find such lecturettes good training for more important functions, for their delivery.



before the members of a photographic society practically means addressing one's friends and acquaintances only, and is a very different ordeal to face as against appearing in the rôle of a professional lecturer in some large theatre or town hall before a sea of faces which sometimes number three or four thousand.

With beginners in public lecturing, no matter how they may buoy themselves up with the hope that their nerves will carry them through, there is always what may be termed a "baptism of fire," and he who can for the first time ascend the steps of a platform and suddenly face a sea of three thousand faces, will certainly find it takes a lot of nerve, probably far more than he has any idea of, to run the gauntlet without showing signs of the nervousness that is sure to seize him. This nervousness may make its presence felt in more ways than one, and affects different individuals in various ways. The writer can well remember what took place at his first "baptism," when appearing before an audience of probably three thousand souls. As to nervousness prior to going on the platform, it practically did not exist, but no sooner was he called upon to step forward and begin speaking than a dreadful sense of weakness at the knees began to manifest itself, but, "setting a strong heart to a styè brea," as we say in Scotland, in a few minutes this trembling passed off, and he was enabled to run right through without the slightest hitch. There is no doubt, however, that, if any nervousness be experienced, it will make its presence felt in the vicinity of the knees, and for a moment or two the feeling of weakness is dreadful to contemplate. The writer has known others whose experience was of a somewhat different character. In their case the nervousness took the form of actually making them become tongue-tied. They suddenly experienced a swimming sensation in the head, and for the life of them were powerless to articulate a single sound. Luckily, these awkward attacks do not last long, and any one determined to face the ordeal should set himself determinedly to face it out.

I have often been asked by beginners in lecturing if there is any means of warding off such feelings of nervousness, and if I approved of a good stiff B. and S. or other stimulant, which strange to say, almost every one imagines to be the best preventive. In this there lies a big mistake; all stimulants I firmly believe to be worse than useless in such circumstances. At a juncture of this kind one wants a clear and cool head; a good dinner or other repast partaken of about half an hour previously is the best stimulant I know of, and, if there be any means of assisting a beginner to get over his baptism of this sort, I believe it lies in a direction in which very few ever think of looking. After now nearly twenty years of public lecturing I don't know what nervousness on a platform means, and I invariably walk on and commence lecturing with the lights full on, and get these by prearrangements turned down at the exact moment; but, were I to have to face my first baptism again under similar circumstances to those I experienced the first time I stepped upon a platform, I should certainly arrange matters differently, and only walk on the platform after the lights were lowered and the introductory slide projected on the screen. This may not entirely get rid of nervousness, but I can truthfully state that those to whom I have recommended it when first they appear in public have thanked me for the hint, and stated they did not know what they would have done had they faced the audience in full gas or other light.

Some individuals who aspire to public lecturing never succeed in it, simply by reason of not possessing a sufficiently powerful voice or the natural ability to frame a really interesting lecture.

The first of these deficiencies is fatal, and, strange to say, there are numbers who imagine they possess plenty of power of voice who utterly fail to make themselves heard beyond a few feet from the platform.

Of course, there is a great difference in the acoustic properties of theatres and halls. Some prove delightful places to speak in, others try one's powers of voice very severely, but a practised speaker in a few seconds will gauge the right amount of power to use, and which will reach the farthest corner of the theatre and come back to himself.

This should never reach what may be termed the bawling stage. If a speaker cannot do this with his natural voice without strain or effort, he is not possessed of the physical ability for public lecturing, and should refrain from following out such a course. A good well-trained voice is of the first importance, and any one possessed of it should take good care of it. The speaking for a period of an hour and half to two hours straight on end may, at the close, tend to introduce a little hoarseness, but it seldom displays itself during the time of speaking—it generally puts in an appearance afterwards, when the voice resumes its normal condition; this hoarseness will pass off in a few hours' time without any applications to the throat or vocal organs. With those in the habit of speaking much in public it has come to be recognised that the muffling or wrapping up of the neck and throat is about the worst possible precaution to take against cold.

No doubt, after speaking a long time to a large audience in a heated hall, there is a certainty of any one becoming overheated; but this soon passes off when one has finished, and it does not take long in a well-ventilated ante-room for any one to reach his normal temperature. Continuous wrapping and muffling of the throat is apt to engender a delicate condition of the throat and vocal organs, and hence does more harm than good.

Literary skill in framing a lecture is another most important factor,

and the best results are certainly produced when a lecturer is speaking about events or scenes that he is familiar with. In framing a lecture, attention must likewise be given to the duration of time each slide is allowed to remain upon the screen, and this is of far more importance than many imagine. I have known some green hands keep a particular slide on for twenty minutes, and then rush three or four through in a few seconds.

Long introductions prior to showing the first slide should also be avoided. This is apt to weary an audience at the outset, and, if this is allowed, it is very difficult to dispel the impression later on, for "first impressions are always strongest." It is almost imperative that a lecturer gets on good terms with his audience at the very outset. This may be effected in a variety of ways, and perhaps as good a method as any is that advocated by the versatile Andrew Pringle, who always contrived to set off a few fireworks, as he termed it, just at the start. This seldom fails to place an audience in good humour, and then a practised lecturer will know how, by sudden turns from grave to gay, to keep his audience in wrapped attention throughout.

The introduction of songs and other items of music does much to brighten up some forms of lectures, but it is questionable if a lecturer should indulge in such singing himself. In the West of Scotland we have one gentleman who has done perhaps more than any one in the kingdom to popularise limelight lecturing, and he invariably introduces a few songs in his lectures; but, having a long purse, he can afford to pay for the very best talent both in male and female voices, and he is too practised a hand to overdo it in this respect. His lectures have been elevated to a very high standpoint indeed, and, whenever it is known he is to give a lecture, the demand for seats is far in excess of accommodation.

Of course the songs that are introduced are specially selected, and invariably bear some reference to the subject he is treating.

The introduction of much that may be termed "A Variety Entertainment" with a limelight lecture may be popular with some kinds of audiences, but for the better class of lectures is not to be commended.

Such lectures as deal with mere matters of holiday travel seldom give much trouble to frame or deliver, simply by reason of the party *knowing what he is speaking about*; and these are frequently very enjoyable indeed, provided the speaker makes a strong determination to avoid reading his description, in this marking a strong contrast to the man who stands up and reads from a book a description of this or that scene or event which he never saw nor took part in.

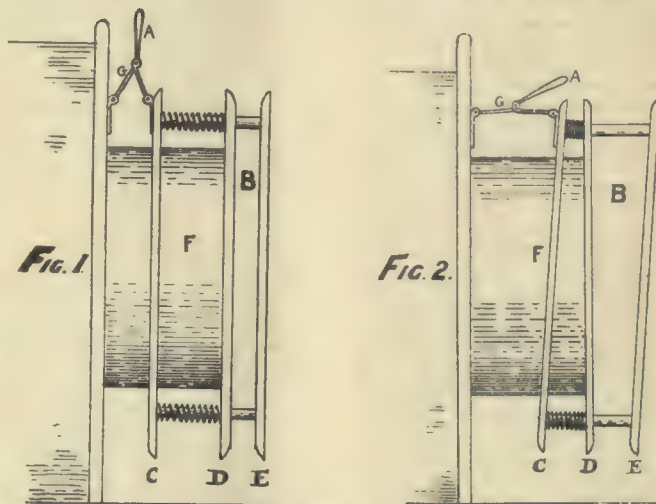
It is such amateur lecturers as these who have done much to injure limelight lecturing throughout the length and breadth of the kingdom.

A really good limelight lecture takes far more trouble and thought to place together than many imagine, and when any one is possessed of the capability of not only taking the pictures themselves, but eventually making their own slides from the same, and describing such in person in a free, natural manner, then we generally get something that is worth seeing and listening to. That our various photographic societies are alive to this would appear tolerably certain from the interest that is being taken in the lecturette competitions that now annually find a place in their proceedings.

T. N. ARMSTRONG.

#### FOR THE LANTERNIST.

Those who possess lanterns furnished with spring-fitted holding plates will, doubtless, agree with me when I say that the task of inserting framed



slides into such lanterns is a very difficult, if not quite impossible, one for one person to accomplish satisfactorily.

The difficulty experienced is very annoying to the lanternist, and, moreover, it is presuming on the good nature and patience of the



audience to expect them to wait whilst the operator is "fumbling" with his lantern.

The object of this article is to describe a simple method by which this difficulty may be entirely obviated, and the task of inserting framed slides into the lantern, instead of being, as heretofore, a source of vexation, becomes a pleasure.

A glance at the two diagrams (figs. 1 and 2) will show the principle of the method.

A hinge, *A*, is fitted to the lantern in the position shown. This hinge should extend right across the lantern, so that the stage may be pressed evenly together. The hinge consists of four separate pieces of brass; *A* and *C* are in one piece, the others are separate, and hinged in the manner shown. Now, when the handle of the hinge—if we may so call it—is upright, as in fig. 1, the spring will be expanded, and the plate, *B*, for the insertion of the slides, closed. The operator, when he desires to insert his framed slide, pulls the hinge, *A*, down, as shown in fig. 2. This obviously presses the top spring in and widens the space, *B*. The lanternist now catches hold of *C* and *D* with the fingers of his left hand, and presses *C* close up to *D*. This widens the space, *B*, at the bottom, and with the right hand the slide is placed in the stage. When the slide is correctly placed, *C* and *D* are released, and the hinge, *A*, pulled up again, allowing the spring to expand and pull the plate, *B*, close against the framed slide, thus holding it tightly in position.

When he desires to take the slide out and replace it by another, the operator has simply to reverse the method of procedure described above.

It will be understood that the accompanying diagrams only represent the stage part of the lantern, *r* being, of course, the tube holding the condenser.

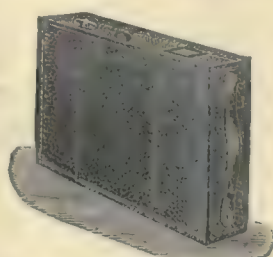
No doubt the lanternist who wishes to make every part of his preparations, &c., as easy as possible will obviate the difficulty encountered in inserting framed slides by adopting this simple yet effective method.

THEODORE BROWN.

#### THE NO. 2 FOLDING BULL'S-EYE KODAK.

KODAK, LIMITED, direct our attention to their new No. 2 Folding Bull's-eye Kodak, which, while taking pictures of the large size of  $8\frac{1}{2} \times 3\frac{1}{2}$  inches, closes up to  $1\frac{1}{2}$  inches in thickness.

The No. 2 Folding Bull's-eye Kodak is on the cartridge system, and takes a spool of film for twelve exposures. It is provided with an entirely new arrangement in the form of a removable spool-holder, which renders the operation of recharging the camera exceedingly simple and easy.



Constructed of wood covered with leather, the new Kodak is extremely light, and is conveniently carried by means of the handle attached to the end of the camera, or it may be slipped into an overcoat pocket. Stand as well as hand work may be undertaken, as the baseboard is provided with socket for tripod screw.

The size of the camera closed is  $1\frac{1}{2} \times 4\frac{1}{2} \times 7\frac{1}{2}$  inches, the weight, 15 ounces, and the length of focus of the lens,  $4\frac{1}{2}$  inches.

The levers controlling the stops and time exposures are conveniently situated, and a third lever, actuating the shutter, is simply pushed to right or left alternately for snap-shots.

#### THE VELOCITY OF METEORS FROM PHOTOGRAPHS.

DR. W. L. ELKIN, director of the Observatory at Yale University, writes as follows in the *Astronomical Journal* (No. 469, p. 102):

"We have been experimenting with an apparatus for determining the velocity of meteors photographically, on a principle similar to that devised by Lane as long ago as 1860, and to that used by Zenker in 1885, but without success apparently (see *American Journal of Science*, vol. xxx. p. 42, and *Astr. Nachr.*, vol. cxiii. p. 228). The same plan has been recently suggested by Fitzgerald (*Astro-physical Journal*, vol. ix. p. 50), and consists in rotating in front of the lens at a known rate a wheel carrying at intervals interceptors of the light falling on the lens. Our apparatus was placed on our meteorograph, and was large enough to occult all of the six large lenses now in use. Our second station is now provided with six cameras, and both instruments were brought into use during the favourable absence of the moon in the first half of August. Unfortunately the nights of August 10, 11, and 12 were completely overcast here, August 9 partly so, so that no records of Perseid meteors seem to show on our plates; but on July 31, August 7, and August 8 each, a

meteor trail from other radiants was secured at both stations, those of July 31 and August 8 showing three or four interruptions, and of August 7 some ten or twelve on the Yale plates. It is, of course, a question as to whether the cosmical velocity can be deduced from these records, and it will be of considerable interest to see whether the results thus derived will agree with the known velocity of the Leonids, if we are fortunate enough to capture any trails next November."

#### ILLUSIONS AND ANOMALIES OF VISION.

AN experimental lecture with the above title was given last week at the Camera Club by Mr. Sheldford Bidwell, F.R.S. This gentleman has long been regarded as an authority on the subject of vision, and his carefully devised experiments, every one of which came off without the least hitch, gave great point of interest to a masterly discourse. As the lecturer had much to say about the phenomena of colour, his words were most attentively listened to, for the followers of what has hitherto been a monochromatic method of picture-making are now, curiously enough, eagerly looking forward to the time when the jackdaw will be able to assume the peacock's feathers.

The lecturer began by asserting that none of our senses was of more importance than that of vision, and none exhibits greater peculiarities. The great Helmholtz once said that, if any skilled optical worker had sent him an instrument so full of imperfections as was the human eye, he should have rejected it as a most faulty piece of apparatus. That great observer also confessed that his own vision was subject to certain disturbances, especially after he had dined well, a condition of things which he attributed to loss of control over the optical muscles. In point of fact, we all see double whether after a good dinner or no, that is to say, we see one point distinctly as a single object, while every other one in the field of view was duplicated. For example, those before him would see at the table one lantern and two lecturers, or *vice versa*.

Optical illusions were of various kinds, and made us make erroneous estimates of height, colour, speed of movement, &c. He would throw upon the lantern screen a diagram, made of four pieces of blue gelatine, which were stepped so that we had a band consisting of different layers, one showing four thicknesses, another three, and so on. These had the appearance of being shaded, so that the whole looked like a fluted column. This was a pure optical illusion. If the divisions were separated each by a fine line, the fluted effect at once disappears.

The next lantern illustration comprised a glass disc with four yellow sectors, cut in their centre with a black band. When the disc was revolved, all details disappeared, and the effect was produced of a yellow disc with a blue ring, the latter colour being complementary to the former. Next the lecturer showed on the screen a succession of light spots moving upwards; but, when the movement was suddenly arrested, the spot remaining on the screen appeared to move in the contrary direction, although in reality it was still.

Mr. Sheldford Bidwell next dealt with the want of achromatism in the eye, and showed several very pretty experiments with a lantern, on the table before him, to illustrate his remarks.

Astigmatism was accounted for by the circumstance that the surface of the eye is not truly spherical, but more like the bowl of a spoon, so that all rays cannot be brought to the same focus. Thus, in looking at crossed lines, either the horizontal ones or the vertical ones seem indistinct, a defect which, in the case of excessive distortion, can be remedied by the use of cylindrical spectacles.

But there is another kind of astigmatism, known as irregular astigmatism, which cannot be corrected by any apparatus. This fault can be detected by pricking a hole in tinfoil and looking through it. The hole will appear to be oval, and, if the foil be brought nearer the eye, it will assume the form of a star with six or more rays, it is due to the construction of the crystalline lens of the eye. The phenomena connected with irregular astigmatism are very curious, and were well illustrated by experiments.

Some visual vagaries depend upon physiological conditions, and one of these is that persistence of vision which causes the image of anything looked at to be retained upon the retina for a period popularly supposed to be about one-tenth of a second; but, as a matter of fact, that period may be either greatly exceeded or greatly reduced, according to circumstances.

The lecturer next showed by one or two good experiments the Young effect, otherwise known as the phenomenon of recurrent vision. A Geissler vacuum tube, mounted so as to turn like a windmill, was followed at a distance of about twenty degrees by a ghost. The same effect was produced on the lantern sheet by a revolving disc, pierced with a hole covered with green glass. The effect ceased if red glass was substituted for the green.

The next piece of apparatus which came under consideration was the toy known as the spectrum top—a top furnished with a card covered with black lines, which appeared coloured when the top was rapidly revolved. This toy excited much discussion when first produced, and it presented great difficulties of explanation, but he hoped to throw some light on the phenomena which it exhibited. The most striking colour in the spectrum top was red, and here we had a notable example of a curious phenomenon. When a bright image is suddenly thrown upon



the retina, it appears to be surrounded by a coloured border, red generally, but, if the light be very bright, it is sometimes blue.

A good way of showing this, for an individual eye, is to take a piece of opaque paper about five inches square, and to make a window of white paper about three quarters of an inch square in its centre. Hold this up to a lamp and shield the eye with a book, now suddenly remove the book and the window will seem to have a red border. Cross the window with a pin, so as to divide the square into two parts, and each part will be surrounded by a red border, the pin, or dividing line, also being red. The black type in a book will also seem red if suddenly disclosed under bright light, and, if a disc and sector be used in front of such a book, the letters will appear permanently red as the disc is turned at the rate of about five revolutions per second. Only lines or dots thus appear to be red, the phenomenon not appearing on an extended black surface. It is due to the sympathetic action of the red nerve fibres and blue and violet sensations not being excited at all, or possibly in a much lesser degree. Some have attributed the phenomenon to want of achromatism in the visual apparatus, but this theory could be disproved by the use of a special form of disc and sector, which he showed and explained.

The well-known effect of negative after-images was then discussed, and the familiar example of a red wafer on a white card, giving rise to a green ghost, was brought forward. It was generally believed that the real image must be stared at for several seconds before the apparition would materialise, but, if a certain condition be observed, the period of staring is reduced to the fraction of a second. The condition was that the retina must have a preliminary rest in darkness; this made it abnormally sensitive. By using a disc and sector of special form any coloured object could be seen in its complementary tint, and by means of an apparatus of the kind, brilliantly lighted by electric glow lamps, the lecturer was able to exhibit the phenomenon in a most effective manner with the help of some specially painted cards. A rose with green petals, a veritable cabbage rose, and red leaves, appeared in the apparatus in its natural garb. A sunflower with purple petals and yellow leaves was, in like manner, translated to a more natural condition. But the *pièce de résistance* was a lady with indigo hair and green face looking at the abnormal sunflower as above described. With a few turns of the disc the lady assumed a more natural colouring, and with this beautiful experiment the lecture closed.

#### THE ADAMSON INCANDESCENT GASLIGHT.

MESSRS. ADAMSON BROTHERS, of Dashwood House, 9, New Broad-street, E.C., have made a very convenient adaptation of incandescent gas to the purposes of photographic portraiture, and an inspection of the apparatus together with some specimens of work produced by its aid satisfies us that photographers have here placed at their disposal a cheap and efficient plan of artificial lighting for the studio.



The system adopted is briefly this: The ordinary supply of house gas is connected up to the apparatus, in the base of which is a gas-holder. A series of four jets, each carrying a mantle, is placed in the concave radiator. One of the jets gives sufficient light to focus by, but, when the full illumination is required, pressure is applied to the gas in the holder, and the blaze of light obtained from the four jets equals a candle power of about 2000.

It is claimed that the exposure required for an ordinary cabinet bust is not more than two seconds, when using any of the quickest brands of plates and a Ross cabinet lens at full aperture.

The standard apparatus will cover a group eight feet across, equally illuminated. As it only weighs 100 lbs., it is capable of being taken out to balls, evening parties, or "at-home work." The apparatus, although working at high pressure, and capable of supplying a number of large incandescent lights, can be supplied with gas from any ordinary tap which may be convenient, so that no new service mains are required to be put in.

The Adamson incandescent gaslight apparatus should be inspected by photographers contemplating a cheap artificial light installation. It is exceedingly simple to work, and, as we have said, the results it yields are all that could be desired.

#### COLOUR PHOTOGRAPHY.

THE announcement that Mr. Cadett would deliver a lecture upon "Orthochromatism" before the Kingston-on-Thames Photographic Society was responsible for a large gathering of members in the Masonic Hall, Sun Hotel, on Monday evening, October 23. Owing, however, to indisposition, Mr. Cadett was unfortunately unable to put in an appearance, but an able substitute was found in Mr. Sanger Shepherd, who for many years has been associated with Mr. F. E. Ives, the inventor of the Kromskop method of colour photography.

To fully appreciate, said the lecturer, the subject of orthochromatism, it was necessary to understand something of spectrum analysis. By means of diagrams drawn upon the blackboard the well-known method of decomposing a beam of white light by means of a prism was explained, an imaginary solar spectrum being mapped out on the board. It is common knowledge that an ordinary or orthochromatic plate is comparatively insensitive to red, orange, and yellow rays, but, by incorporating certain dyes with the emulsion, it is possible, he explained, to manufacture a plate, such as the Cadett Spectrum, sensitive to the whole length of the solar spectrum, or, in other words, sensitive to all the colours to be found in nature. Obviously with a plate of this description it becomes possible to correctly reproduce in monochrome all colour luminosities, provided, of course, that a properly adjusted light filter be used to cut down the action of the blue-violet rays, or, to be more explicit, a screen to equalise the exposure required for all the colours of the painting or subject to be photographed. Such a screen was handed round for inspection, and can be commercially obtained adjusted for use with the Spectrum plate. Mr. Shepherd then proceeded to deal with the more important work for which this particular plate is adapted, namely, the reproduction of colour by photography. Again referring to the diagrams upon the blackboard, he explained the well-known Young-Helmholtz theory of colour vision, viz., that all the colours in the prismatic solar spectrum may be formed from three fundamental or primary colours—red, green, and blue-violet. Any colour to be found in nature may be exactly counterfeited by mixing these coloured lights in various proportions, as, for instance, by blending red and green we produce a yellow, by mixing green and blue-violet we obtain a blue, and by combining all three a white light is formed. This, then, is the foundation upon which trichromatic or colour photography is based. To produce a practical result in colour, three negatives of the subject to be photographed are made upon Spectrum plates, through red, green, and blue-violet filters, each screen being carefully adjusted for use with this particular plate. From these negatives transparent positives are made upon thin, clear celluloid, coated with soluble gelatine containing bromide of silver. This film, which will shortly be placed upon the market with the necessary light filters for making the negatives, is sensitised in a one per cent. solution of bichromate of potash and dried in the dark, when it is ready for exposure to daylight behind the negatives, the celluloid surface being in contact with the negative film.

When sufficiently printed, they are removed from the printing frames and developed in warm water, as in the carbon process. The silver bromide is next dissolved by immersing the films in hyposulphite of soda, leaving transparent gelatine pictures in relief upon an equally transparent celluloid support. After washing out all traces of hyposulphite of soda from the gelatine image, the prints are ready for colouring by immersion in dyes which stain the gelatine relief, the celluloid support, being impervious to the colouring baths, retaining its colourless transparency. The print from the negative made through the blue-violet screen is placed in a yellow dye, the complementary to the fundamental primary blue-violet, this being the colour formed by blending the red and green primaries. Similarly, the print from the negative taken through the green screen is stained a magenta pink complementary to the green, the positive from the negative made through the red screen being immersed in a cyan blue bath, this being the colour obtained by mixing primaries green and blue-violet, therefore complementary to the primary fundamental colour, red. When dry, the three positives are superimposed in perfect registration, and bound up in the form of a lantern transparency, the result being more or less a faithful photograph in colour, according to the amount of care bestowed upon the details of manipulation. It is possible, said the lecturer, to obtain the three negatives with an ordinary camera by using the screens in front of the lens,



and making successive exposures upon three separate "spectrum" plates. The ideal form of camera, however, should be capable of simultaneously making the three negatives upon one plate and from one point of view. Such a camera had been invented and used by Mr. Ives, but, owing to the complicated arrangement of prisms and transparent reflectors adopted to split up and bend the rays coming through the lens to three separate portions of the plate, it had only been possible to manufacture three cameras. These had cost Mr. Ives and himself months of wearisome labour, so that there is little likelihood of this instrument being placed upon the market. He had, he said, been separated from Mr. Ives for some considerable time, but they both, however, had had the subject of a suitable camera before them. While Mr. Ives in the States had taken out patents for a modification of his own apparatus, he (the lecturer) had devised a modification of the camera designed by Ducons du Hauron, which the latter inventor used for experimental work back in the sixties, the improvement consisting of a clever arrangement of coloured diaphragms, by means of which the three exposures could be adjusted at will.

Proceeding to the lantern, Mr. Shepherd threw upon the screen numerous examples of trichromatic lantern slides, made by himself, some being from negatives by Mr. Saville Kent, author of *The Great Barrier Reef of Australia*. These proved to be excellent examples of the process, the pictures of a peacock's feather, butterflies and moths, some orchids, and a group of fish being especially remarkable for their fidelity of colouring.

In response to inquiries, Mr. Shepherd stated that he had seen some excellent landscape slides by Mr. Cadett, who had taken one of his (the lecturer's) cameras to Switzerland. With regard to permanence, the dyes used in staining the tricolour transparencies were stated to be permanent. Asked what possibilities there were of printing on paper, the lecturer described an ingenious printing machine, the invention of a Russian, having for its object the simplification of the registration of the three printings in commercial trichromatic work as applied to a considerable extent at the present time in the illustration of books and magazines, as, for example, the reproduction of *The North-West Passage* by the late Sir J. E. Millais, issued as a frontispiece with *The English Illustrated* of September last. This invention being of no practical interest to amateur photographers, we refrain from entering into details of construction. So far as we are aware, the resuscitated gum-bichromate process is the only method which lends itself to the requirements of photographers in the matter of making colour prints on paper from the three negatives by direct exposure to light. Owing principally to the vagaries of the process and the difficulty of selecting transparent pigments of the required tints, the results cannot always be considered a facsimile in colour. Nevertheless, we have seen many really pretty pictures produced in this way.

### WINDOW TRANSPARENCIES.

Those who have had experience in the making of lantern slides are well aware that however beautiful a glass positive may appear when examined by transmitted light, that is when held up towards the light and looked through, its qualities as so considered cannot be taken as a criterion for judging of the appearance it will have when projected upon the screen by the magic lantern.

To the eye the glass positive, says A. J. H. in the *American Journal of Photography*, so examined, may have everything desirable—crispness, softness, abundance of gradations of lights and rich transparent shadows, but all these may suffer by probation when subjected to a cross-examination in the ordeal of the lantern light.

The knowledge acquired by a long experience in handling lantern slides is the only surety one can have that his judgment is just when decision is given in opposition to the criticism of one who thinks his estimate of apparent virtues in the slide is true and righteous altogether.

With wet collodion the conditions controlling the production of good work, that is, work good for the purpose intended, lantern projection, are more in abeyance to the operator and a uniformity of results more constant. But it is otherwise with the making of lantern slides with gelatine plates. There is not the same assurance that the products will be always the same under the same conditions.

With wet plates, if the collodion is properly constituted and the bath is in good working order, the work becomes almost automatic. However, those qualities which militate against the slides' perfection are by no means inimical to the beauty of results when the positive is intended to be hung up at a window.

Window transparencies may be made either by contact printing or by reduction or enlargement in the camera.

Contact printing is perhaps more generally employed when the negative is of a proper size for framing.

If a mat is employed to cut off marginal portions, care should be taken to secure the thinnest possible paper which shall be thoroughly opaque, otherwise the margins will be hazy. A pad in the printing frame is also necessary to ensure perfect contact of the two surfaces.

It is generally advisable to employ a slow variety of gelatine plate, one in which there is a percentage of iodide of silver; but, if care is taken in exposure with a rapid plate so as not to produce halation or blurring of the high lights, as good results may be obtained.

The exposure when made by contact in the printing frame, should be by gas or artificial light, the frame being held at about eighteen inches or more from the source of illumination. In vignetting, the distance should be increased to five or six feet, so as to avoid harsh shadows around the vignette.

The frame, whether vignetting is employed or not, should be covered with tissue on the outside. Then portions which would be liable to print too intense while the high lights were exposing should be shaded by masks kept in gentle motion, to prevent impression of definite outlines on the plate.

The duration of exposure will, of course, depend upon the character of the negative. On general principles it is best to give full exposures. And here we may say that a rather soft negative yields much more harmonious positives than a contrast negative, inasmuch as vigour, if necessary, may be given to the positive during development by regulation of its constituents and by judicious use of restrainers.

Ferrous oxalate is generally used as a developer, but equally good results may be secured with the employment of the new developers.

Pyro has a tendency to discolour the film, especially if soda is used as an alkali. The addition of a considerable amount of sodium sulphite to the pyro developer, a good washing after development, and clean fixing will ensure bright positives.

If the ferrous oxalate is used as a developer, though it may be antiquated, the operator will be delighted with the exceeding beauty of the positive, which no other mode of development can exceed. Never use even a slightly turbid ferrous-oxalate developer, and always use in connexion with it a few drops of citric acid (ten per cent. solution), and also a few drops of a ten per cent. solution of bromide of potassium. A few drops of syrup (sugar, 1 part; water, 10 parts) will give density and body to a positive and a delightful crisp relieved appearance.

If the ferrous-oxalate developer is not used, the following mixed developer will be found to work well:—

A.	
Hydroquinone .....	80 grains.
Eikonogen .....	80 "
Sulphite of soda.....	1 ounce.
Water .....	32 ounces.
Sulphuric acid .....	1 drachm.

B.	
Carbonate of potassa .....	2 ounces.
Sulphite of soda.....	1 ounce.
Water .....	32 ounces.

C.	
Bromide of potassium .....	1 ounce.
Water .....	4 ounces.

Use equal parts A and B with 5 drops of C.

The ferrous-oxalate developer generally gives results beautiful enough without toning; but, if one desires to tone the transparency any particular colour, any of the well-known toning baths of platinum, gold, uranium, palladium, &c., may be used.

Palladium gives a most beautiful dark purple tone if very dilute bath is used and the action long continued. The writer has made quite a number of toned transparencies with the use of palladium, very dilute, and continuing the action by means of a mechanical rocker for eight or ten hours.

The following method gives beautiful tones:—

First tone with gold (one grain to ounce of water), wash off the plate, and intensify with following:—

Bichloride of mercury .....	$\frac{1}{2}$ ounce.
Chloride of copper .....	$\frac{3}{4}$ "
Hydrochloric acid.....	5 drops.
Water.....	16 ounces.

Rock the plate in this solution until the image is bleached through to the back, then blacken with weak ammonia water.

Russet tones may be had by developing the image up to a certain degree, not full density, then washing off thoroughly and immediately placing the positive before fixing in the above mercurial solution until the image entirely disappears, then washing it most thoroughly and fixing in the hypo.

The hyposulphite restores the bleached-out image. The colour of this image so obtained may be modified farther by toning with gold.

If, after development and fixation, the transparency is subjected to a toning consisting of—

Iodide of iron.....	1 drachm,
Water .....	16 ounces,
Iodine (tincture) .....	5 drops,

a most beautiful opalescent effect is produced, together with a pleasing rose colour of the image. Such transparencies need no ground glass, and may be advantageously employed for ornamental screens for lamps, &c. To prevent scratching of the surface of the film, they may be mounted under plain glass, or the film itself may be hardened by bathing the plate in a solution of formaldehyde:—

Formaldehyde .....	1 drachm.
Water .....	8 ounces.



## ALUMINIUM FLASH POWDERS.

Mr. GEORGE RAU's paper on "Flashlight Compounds," contributed to a recent number of the *American Journal of Photography*, says Mr. A. J. Hahn, in that journal, speaks of the value of aluminium metal in giving an intense actinic light for photographic purposes. Mr. Rau recommends the commercially prepared aluminium silver bronze, which is a very finely divided form of the metal. The bronze is contaminated with a greasy body, which is added, I suppose, to cause the bronze powder to adhere to surfaces. But, however useful as associated with the aluminium as a bronzer, it is not at all desirable in connexion with flash powder, and it will be found best to get rid of it in compounding your flash powder. For this purpose all that is necessary is to heat it in a test tube, or other receptacle, over a Bunsen burner or spirit lamp. So purified, it may be used alone as magnesium is, and projected directly into the flame, giving a much more powerful light and not as annoying fumes. The presence of the grease causes the aluminium powder to clot and prevents its full energy being utilised.

As Mr. Rau suggests, its combination with amorphous phosphorus and barium and strontium nitrates makes one of the most powerful artificial lights for photographic purposes. It is surprising what an amount of energy a few grains of such a combination possesses, and, I think, if ordinary care is used, there is but little danger attending. I keep my chemicals separate, and mix only the quantity needed for the occasion. In this manner one secures the full energy of the powder in its dry state, avoids any risk of caking of the powder caused by the tendency of the strontium and barium to absorb moisture from the atmosphere, and also reduces to the minimum the risk of explosion.

## GEOLOGICAL LANTERN SLIDES.

WE have received the Annual Report and Transactions of the South-Eastern Union of Scientific Societies, from which we take the following extract:—

"During the past year the set of eighty-two geological lantern slides formed in 1897, and illustrating the upper and lower greensand and gault, has been on loan, but only two of our affiliated societies have availed themselves of this opportunity of bringing an interesting local formation under the notice of their members.

"Owing to the apathy that seems to exist amongst most of our societies in matters geological, it was decided at the last Congress to widen the scope of the lantern-slide scheme, and invite contributions towards the formation of sets dealing with—

- "(i.) Prehistoric Man in S.E. England;
- "(ii.) English Wild Flowers, with special reference to forms of capsules and their dehiscences;
- "(iii.) Coast Erosion in S.E. England;
- "(iv.) Marine Animals and Plants as transparent lantern slides (according to Dr. H. C. Sorby's method described in *Nature*, March 31, 1898, p. 520).

"It was hoped that the widening of the scope would awake a greater amount of interest and support, but so far the appeal has not met with much response. Two valuable offers of assistance have been received. Mr. F. V. James, F.S.A., of the Museum, Maidstone, has kindly volunteered to organize the set dealing with 'Prehistoric Man,' and, by the special knowledge gained from his own researches and the materials already at his command, the success of this set should be assured. Mr. James will be glad to hear from any members who may be willing to co-operate with him by contributing slides or information dealing with the subject.

"Mr. Stephen Horsley, St. Peter's House, Canterbury, President of the East Kent Natural History Society, has kindly consented to take charge of set ii., dealing with our English wild flowers, a subject to which he has devoted much time and labour. The value of Mr. Horsley's assistance will be best gauged by an extract from one of his letters: 'I have thought for some time that one could not do better than make over one's scientific slides to a Society such as ours while one is alive; for, except in special cases, it must be very difficult to know what to do with such slides after the death of the owner, unless they are of sufficient importance to be definitely left to a society or institution in one's will. I have two or three hundred slides, many of them coloured, which I have made from the actual plants, and I will go over them and make out a list of those that would be useful to the Union, and present them to it.' It is to be hoped that Mr. Horsley's generous offer will find many imitators. Serious illness has, unfortunately, interfered with his intentions, but one set on which he is engaged deals with our local orchids, each kind being represented generally by several slides, showing (i.) general growth, (ii.) root, (iii.) flower, (iv.) details of flower, (v.) microscopical details of anthers, rostellum, pollinia, &c. In view of the highly specialised structure of the Orchidaceæ, and their wonderful adaptations to insect fertilisation, this set should prove most interesting and instructive. Mr. Horsley also contemplates a second set, dealing with the fruit and capsules of common plants and trees, and will welcome any offers of assistance towards rendering either set more complete.

"The subject of 'Coast Erosion' is a most important one, and should receive special attention at the hands of those societies whose situation gives them the opportunity of noting the wear and tear of our cliffs.

There is no lack of material for an excellent set of slides, illustrating not only the results, but the agencies at work in shaping the contour and profile of the coast-line. The appeal for assistance in this direction has not been very fruitful, but the Photographic Secretary is hoping to secure offers of help during the coming summer.

"No contributions towards set iv. have hitherto come to hand. Dr. Sorby's method of preserving marine animals and plants as transparent lantern slides is probably known to few, but all necessary information is given in the article in *Nature* already referred to.

"The work of the photographic section of our Union may be made most valuable if the secretaries of the various societies will only give it their hearty co-operation by getting one of their members to act as local correspondent, so as to bring the photographic Secretary into direct touch with the local Society. In this way only can the slide scheme be made a complete success, and the life of the section be kept healthy and vigorous.

"Many of our members are interested in photo-micrography, and I would suggest that this be added to those subjects to which attention has been called in this report."

## FLASHLIGHT PHOTOGRAPHY.

At a meeting of the Leeds Camera Club, on Wednesday evening, October 25, a lecture and practical demonstration of flashlight photography was given by Mr. J. W. Wade, of the Manchester A.P.S., one of the most experienced and best-known workers in this interesting branch. Whilst not advocating flashlight in preference to daylight, Mr. Wade showed it was a most useful adjunct, for it enabled certain work to be done which otherwise could not very well be obtained. Perhaps its most useful application was in portraiture, especially theatrical and fancy dress costumes, which generally had to be done by artificial light. The lecturer showed that, in combination with daylight, effects could very often be produced that were unobtainable without its use. Most of the best work in the French school of photographers in portraiture is done in this way. Using the magnesium light alone, the same effects were seen by using two or more lamps, suitably arranged with respect to the sitter. The principal light should not be in front of the camera, but a little to one side, whilst any lamp placed behind the sitter should be screened by tissue paper in order to diffuse the light. The various forms of lamps to use, and their different features, were clearly dealt with, and the position of the sitter, the background, camera, &c., indicated. For the photographing of flowers he strongly recommended its use.

The lecture was illustrated by over a hundred lantern slides, the product of many years' work, and the result of many trials and much tribulation, although the resultant pictures were many of them very beautiful.

The lecturer afterwards demonstrated the process by photographing a sitter, a lady model, in a classical Greek dress, whom he had brought with him from Manchester, as well as one of the members (Mr. Homburg), who was dressed in a most original and effective Roman costume. Much interesting and valuable information was given by Mr. Wade, and he, along with his sitters, were accorded the hearty thanks of the members, the room being crowded.

## A REVOLVING DEVELOPING DEVICE.

THIS is the invention of Mr. W. F. Crawford, and consists of a pair of discs mounted upon a horizontal axis, and having their inner surface grooved radially in such a manner that the grooves of each disc are exactly opposite the grooves of the other disc, and are thus capable of receiving one or more photographic plates or carriers in or upon which the films, plates, prints, or the like, can be disposed. This apparatus is suitably supported over a trough of convenient shape, and so that practically the lower half of the discs is immersed in the liquid contained in the said trough. Means are provided for rotating the said discs and for the supply of liquid, and also arranged for the easy removal of the discs with their contents from one trough to another where required. This apparatus consequently forms a very effective and simple device for developing, fixing, rinsing or washing plates or films, or for toning, fixing, and washing prints.

Mr. Crawford's description is as follows: In the drawing of figs. 1, 2, 3, 4, 6, 7, 8, *a* indicates the trough internally, half circular, of a slightly greater diameter than the discs; *b*, the discs; *c*, the shaft or horizontal axis; *d*, the milled buttons (only one shown) for revolving the apparatus by hand. In place of milled buttons ordinary handles may be employed, *e*, the film or plate-carrier; *f*, the radial sector. The discs, *b*, connected by the shaft, *c*, are shown in fig. 8 as supported in bearings in the edges of the trough, *a*.

Each disc, *b*, has at least one peripheral groove, *k*, in which is located an elastic ring, *l*. This ring is of a diameter slightly smaller than that of the discs, so that it will remain turned over towards the inside or towards the outside of the groove, according to the position in which it is placed by the operator, and, moreover, the ring can be turned over partly in one direction and partly in the other.

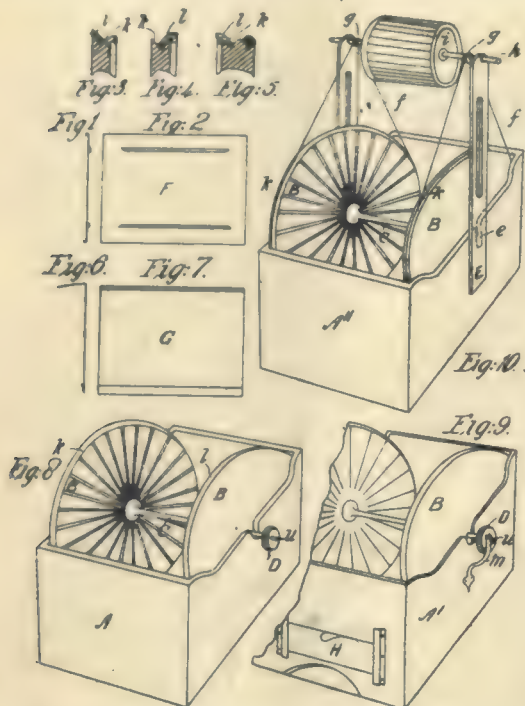


The discs, *b*, are radially grooved, as shown in fig. 8. The grooves of each disc are arranged exactly opposite the corresponding grooves of the other side, and the photographic plates and carriers, *r* (figs. 1 and 2), and radial sectors, *c* (figs. 6 and 7), are arranged to slide in these grooves.

The apparatus shown in fig. 8 is intended to be revolved by hand by turning the milled buttons, *d*, and in this manner an effective developing, toning, fixing, or washing of the plates, films, prints, or the like, can be obtained.

The radial sectors (figs. 6 and 7) may be used to produce sectional chambers between the discs by placing them with the tops all facing in one direction, to accommodate plates, films, or prints during the processes of developing, fixing, toning, or washing. The sectors may consist of pieces of perforated zinc, or other suitable metal, bent into the form shown in section in fig. 6.

The carrier shown in fig. 1 is preferably of a double form, as shown, and may be used either for the largest size the machine can take, or smaller plates, films, or prints, which are inserted therein sideways within wider or narrower curved edges, as shown in the drawings.



In fig. 9, *A*<sup>1</sup> indicates a trough constructed of tin or other suitable metal, similar in shape and construction to *A* (fig. 8), with lugs or brackets, *m*, to support the spindle by its smaller bearings, *u*, shown on the milled buttons, *d*, during the process of automatic washing of plates, films, or prints, which operation is performed by the impact of the washing water on the plates or carriers causing the whole to revolve. *H* is a sliding regulator to govern the exit of the washing water.

In fig. 10, *A* indicates the trough, as in fig. 8; *B*, the discs; *C*, the shaft. The ends of the shaft, *C*, enter slots, *e*, in the side of the trough, so arranged that the shaft is merely kept in place, and the discs are entirely supported by being suspended by the driving bands, *f*, from the pulleys, *g*, on the horizontal shaft, *h*, of the motor, *i*.

The apparatus (fig. 10) is intended to be operated automatically by the water employed in washing the larger sizes of the plates, films, or prints.

The motor, *i*, which may be a paddle wheel, turbine, or other convenient form of motor, receives the water from a jet or otherwise, and is set in motion thereby, and as the discs, shaft, and contents are suspended by the endless bands, *f*, from the axle, *h*, of the said motor, the apparatus is revolved in accordance with the revolving of said motor, and the washing of the plates, films, or prints, is effected automatically. The plates, films, or prints are kept in position by the perforated radial sectors shown in figs. 6 and 7, or may be attached to the carriers, *r*, or, in the case of plates, may be slid into the grooves without carriers or supports.

For ordinary developing, fixing, and toning processes, and for slight washing or rinsing, I make use of the apparatus shown in fig. 8. Having placed a sufficient quantity of developing solution in the trough, *A*, and inserted the plates in the radial grooves of the discs, *b*, I then turn the rubber strips or rings, *l*, inwards, which immediately and effectively prevents any of the plates from slipping out as the discs revolve. I then cause the discs and contents to revolve in the trough until the

plates are fully developed. The discs are now lifted out of the trough and placed in the washing trough, *A*<sup>1</sup> (fig. 9), and automatically washed for a sufficient time. *A* (fig. 8) is emptied of developer, washed, and charged with sufficient fixing solution, whereupon the discs are immersed and revolved in it until fixation is completed. The discs are finally removed and placed in trough, *A*<sup>1</sup> (fig. 9), where they revolve by the impact of the water on the plates or carriers from a tap or other orifice, until they are completely washed.

The manipulation of films and prints is substantially the same as for plates, but the films and prints are first inserted in the carriers (figs. 1 and 2), or they may be placed in the sectoral chambers formed by placing the radial sectors, *c*, in position.

The apparatus shown in fig. 10 is designed for plates, films, or prints of a larger size than half-plate, and is driven automatically by a constant flow of liquid which, after revolving the motor, falls on the perforated radial sectors, plates, or carriers (figs. 6 and 7), which are placed in the grooves of the discs as described, percolates through them, and falls into the trough, and escapes therefrom by a siphon or suitable orifice.

### LANTERN SLIDES PICTORIALLY CONSIDERED.

BEFORE the Borough Polytechnic Photographic Society on October 25, Mr. John A. Hodges, F.R.P.S., delivered a lecture on "Artistic Lantern Slide-making." He said the question of the artistic rendering of lantern slides had given rise to much controversy, and probably would continue to do so, although he certainly thought that the subject had been unfairly dealt with by critics, who he feared had been wilfully blind to any redeeming qualities in this phase of photography. He did not pose as an advocate of unrestrained "faking" over the unaided production of chemistry and light, but necessity was a stern taskmaster, and, when one is brought face to face with difficulties that may be overcome by skilful treatment, surely it would be worse than folly not to recognise that fact and take the fullest advantage of it. Nature was not necessarily art, therefore a photographer may reproduce nature *minus* art; the skill of the artistic photographer consisted in so subduing or emphasising the purely photographic result. The artistic photographer, in making his prints, resorted to sundry methods of "dodging" to modify these defects and produce a definite result. The lecturer then proceeded to describe his method of local control which could be applied to the production of lantern slides. A thin but well-graded negative was obtained, in which the high lights just lacked the vigour necessary for producing a good slide. Intensification, he said, would not to any appreciable extent alter the scale of gradation and practically the density was increased proportionately throughout, whereas the true remedy, in order to produce a more pleasing pictorial effect, was to slightly alter the relative values of the various tones. He did this in the following manner: A piece of very fine and evenly ground glass of the size of the negative was bound up with it, the ground surface being outward. The negative is then placed in an ordinary retouching desk and the high lights and lighter tones of the picture strengthened. Elaborate working up was undesirable. For introducing half-tones in masses, for subduing depth of shadow, and generally when dealing with large areas, he thought the best medium was plumbago or black lead, very finely powdered, applied with the finger-tip, and worked down with a stump. High lights could be accentuated, strengthened, or even introduced with black-lead pencils of different grades, B and BB being the two most useful numbers.

We have received from Mr. John Piggott, of 117 & 118, Cheapside, E.C., his supplementary list of lanterns, in which there are mentioned many cheap items of optical projection apparatus.

We are asked to note that Messrs. Newton, of Fleet-street, have just received a very fine lot of negatives of the Transvaal and neighbourhood, from which they are making lantern slides. These are in addition to those they have already published.

Mrs. R. B. LODGE, of Enfield, gave a very interesting lantern lecture at the Bedford Y.M.C.A. Hall, in connexion with the Beds Natural History Society, on Wednesday, October 25, entitled "British Birds at Home and Abroad." A very large number of excellent views were shown depicting the birds in their haunts, nests, &c. The subjects dealt with included: "The Sea Birds of the Farne Islands," "On the Shores of the Wash," "Bird Life in the Broads," "British Birds in Dutch Marshes," "Bird Life in the Spanish Marismas," and "Suburban Birds." The lecture was much appreciated.

THE Hon. Sec. of many a photographic club often wishes to call the attention of members to such little items as "Subscriptions are now due," "Members are invited to bring their lady friends to the next meeting," &c. Here is a hint which will enable him to write his notice on a bit of clean glass and then pass it through the lantern. Hunt up an inkstand which has dried up or is at least too thick and muddy for ordinary use. To this add a few drops of thick gum-water. Mix well, and you will find you can, with a little patience and a fairly soft broad pointed pen, write as easily with the mixture on glass as on paper with ordinary ink.—*Photographic Scraps.*



## MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."

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# THE LANTERN RECORD.

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### LANTERN MEMS.

THE Inaugural Evening of the Lantern Section of the Royal Photographic Society was a distinct success, and the introductory address by Mr. J. J. Vezey, F.R.M.S., lucid and convincing. He put forward the claims of the optical lantern in connexion with photography, and emphasised it afterwards by having projected on the screen a series of lantern slides that were typical of artistic conception and excellent manipulation. It is seldom that I have had the pleasure of seeing so many beautiful archæological and architectural subjects at one sitting, and Captain C. E. Gladstone, R.N., is to be congratulated on the results of his careful selection of positions and lighting of the subject when taking the negatives.

\* \* \* \* \*

THE title of the lecture, which Mr. Vezey made very interesting, was "Some Mediæval Towns of Germany," and, as pictures, many of the photographs shown were almost faultless. The eleventh and twelfth-century buildings were very quaint, and the scenery, with houses built on artificial islands in the water, most curious. Some of the most successful slides were the views through archways, and of odd corners of the old cities, crypts of cathedrals, and beautifully sculptured doorways. In all, some 120 slides were shown, and very few were without some distinctive merit in the matter of treatment, besides being records of architectural beauty.

\* \* \* \* \*

IT is to be hoped that the suggestion of the lecturer will be carried out, that the R.P.S. will continue the work started by the Lantern Society, and the monthly lantern nights will bring together those interested in lantern work for their mutual benefit and advancement, and also add to the membership of the Society. With a Society so well established the lantern section should always have reasonable support, and those lantern workers who are not members of a photographic society will benefit by being enrolled in the parent society devoted to the black art.

\* \* \* \* \*

WITH projection microscopes, polariscopes, spectrum apparatus, and photo-chromotropes to work with, many interesting evenings are in store; and even the erstwhile much-abused dissolving-view apparatus will, I venture to predict, furnish an agreeable change, if not a record entertainment, for of recent years many very beautiful dioramic effects have been produced that can be exhibited with such

exactness of register as to produce realism, by apparatus designed to give perfect optical and mechanical control, and mostly without further assistance than one well-practised lanternist. Many of these slides have photographic bases, and therefore should be not only permissible but welcome in a photographic society.

\* \* \* \* \*

IF one can take as Gospel truth what one finds in the lay papers respecting the money made by animated photography, not only the proprietors of the films but also the "subjects," when they happen to be the principals in a boxing match, are to be congratulated, for beyond a *small* matter of 3000*l.* paid for the privilege of biographing the event, a third share in all future earnings of the film is stipulated for, and as the result of one contest the victor is stated to have netted over 6000*l.*, while the loser's share was over 2000*l.* It appears that a film fifteen miles long is on its way to England, and will shortly be exhibited at the St. Stephen's Hall, Royal Aquarium, and, if the results to Messrs. Jeffries and Sharkey are proportionate to that just referred to, one almost wishes it had fallen to the lot of a humble servant of optical science to have been attached to the boxing science instead, for the said film is reported to be of the estimated value of 100,000*l.*, and the boxers respectively are expected to realise 37,000*l.* and 33,000*l.* This is beyond the dreams of avarice. Who would not be a boxer and say, "Hail Columbia!"

\* \* \* \* \*

IT is quite a revelation to some of the public, and especially gentlemen getting up lectures to be illustrated by lantern slides, that there is such a thing as a law of copyright, and it is quite amusing to hear the innocent way in which they calmly ask for such-and-such a picture or portrait to be photographed on glass. The climax was reached the other day when a gentleman took into an optician's shop the frontispiece to Rudyard Kipling's poem of the "Absent-minded Beggar" for a slide to be made by the day after to-morrow. He was asked if he had permission *in writing* from Mr. Caton Woodville, the artist, or the proprietor of the copyright, and said, "Oh, that's all right! I have permission to recite the poem." When told it might cost 200*l.* if done, as injunctions in Chancery are expensive matters, he opened his eyes rather wide. It is well for all lanternists to understand that, if a slide is used for profit, even if photographed by themselves, they lay themselves open to an action at law.

\* \* \* \* \*

THE demand for slides connected with the war in South Africa is growing apace, and Messrs. Newton are publishing some good reproductions of the stirring events as depicted in the illustrated journals, besides having photographs of some good scenery. Mr. J. H. Steward has received direct from South Africa a fine collection of natural photographs, which embrace places in the Transvaal that have not hitherto been obtainable as lantern slides; they number some sixty slides or so, and are published by the authority of the Cape Government Railways. War is a dreadful necessity at times, and when



one remembers, as I do, the fine body of officers and men that were reviewed recently at Wellington Barracks, and now learn from the papers that some of them have been struck down by shot or shell, it seems as if personal friends had been lost, for I was in touch with so many of them in business matters, as an officer to be of use nowadays must be scientific. My advice to those who have pictures applicable to lectures on the war is, publish them, for the martial spirit of the country is aroused and everywhere patriotism is rampant.

G. R. BAKER.

### LANTERN RADIANTS.

[A Paper read before the Photographic Club.]

THE radiants which I bring before your notice are only those of a useful and commercial nature, as I do not think that a description of obsolete apparatus would serve any good purpose. Those to which I shall allude are the petroleum lamp, acetylene, the incandescent Welsbach mantle, limelight, and the incandescent and arc electric lamps.

*Petroleum.*—The first practical lamp was that introduced by our American friend, Mr. Marcy, of Philadelphia, who worked out a form of lamp which, up to the present day, is embodied in nearly every petroleum lamp and lantern. The "Sciopticon" is the name of the lantern, and it was introduced into England by Mr. Woodbury. It has two flat wicks about two inches wide and parallel to each other, having an air space between them. The edges of the wicks are placed towards the condenser. A very good light is given off, and the lamp is about the coolest oil lamp working.

Other lamps have been introduced, all adhering to the same size of wick, but having, instead of two, as many as three, four, and even five wicks. Of the three-wick lamps, Newton's Refulgent is the best in my opinion. It was introduced to obviate the dark space which was always noticeable with the two-wick lamp, owing to the dividing space. Stock's patent lamp, a four-wick lamp, cannot be beaten for light-giving properties, construction, and working, amongst its kind. It differs from the old form, both in the body or combustion chamber, and in the chimney. The combustion chamber is formed so that the incoming air is brought into contact with the flame in such a manner as to produce, in conjunction with it, the best result, and is provided with an adjustable reflector for collecting and bringing as much light as possible into focus. Provision is made for the extension of the chimney mechanically. This is very important in practice, as on first lighting a lamp everything is cool, and the evaporation of the oil is much less than when the whole lamp is heated. Hence one must either turn the wicks down, or gradually lengthen the chimney as the lamp gets heated. The latter is the better course. The light is increased, and one has only a single knob to turn in the chimney, while to tamper with the wicks, which are four in number, each requiring nice adjustment, takes a considerable time, with very often a poor result. The chief point in favour of petroleum lamps is that petroleum can be purchased nearly everywhere, and it is always ready for use. There is little or no danger, and it gives a very fair light with the average commercial slide. Five-wick lamps were introduced, but were found difficult to manage. The combustion was bad, and very great heat was given out.

*Acetylene.*—This gas gives a very white and intense light compared with petroleum, although I think the quantity is about equal. It is generated with little trouble, and is easy to manipulate. There are many very good generators now obtainable, notably those of Messrs. Thorn & Hoddle, the Abingdon Safety Generator Company, and the Bon-Accord Acetylene Gas Company. Each of them has features of its own, but all are suitable for lantern purposes. Mr. W. Tylar, of Birmingham, has specially constructed an exceedingly portable form, which takes the place of the petroleum lamp and fits in the lantern body, taking up no more space, and reported to give satisfactory results. There are, however, disadvantages about acetylene, and one is the corroding of the burners. Great improvements in these have lately been made, and without doubt this fault will soon be overcome with the purification of the gas and other improvements which are being effected in the generators. Another

difficulty is that, unless special care be taken to make all joints sound, small leakages will soon make themselves known by the strong and peculiar odour of the gas. Acetylene is, like all other hydrocarbons, perfectly safe until oxygen combines with it, but in its simple form may be considered without danger.

The Welsbach mantle has been before this Club upon more than one occasion. I have been experimenting with it to see what its real value as a radiant for lantern work might be, but up to the present can only look upon it as a convenient radiant for places such as drawing-rooms, with a disc of six to nine feet. I have also put the mantle in lantern for enlarging work, where it has given every satisfaction.

I have recently been experimenting, in conjunction with Mr. Henry Howell, of the Welsbach Company, and have brought up the burner constructed by him to show you. To obtain better pressure I have introduced a cylinder of condensed gas, which gives a pressure much higher than can be had from the house supply. Unfortunately, one cannot yet rely upon the compressed gas, owing to the iron which it contains depositing upon combustion upon the mantle, quickly ruining the latter's incandescent properties.

With a cylinder of coal gas kept standing for three months, the mantle will go in a few minutes. House gas can be used with a mantle for an average of one thousand hours. We were promised stronger mantles, which would stand the increased pressure of the compressed gas, but I find that there is an almost daily shrinkage of the mantle against the burner, and sooner or later it splits. It should be seen that no flame is proceeding above the mantle, turning down the gas until this is remedied. Its illumination is about equal to that of the oil lamp, but its drawback is that its area is so great.

Limelight is obtained by the incandescence of a white-hot lime. There are several forms of apparatus with which to bring about this object, and one of the most simple is a jet named the Safety Jet, or Blow-through Jet. For the reason for the name "Safety" we must go back to the early days, when the gas was stored in bags, and there was little to prevent the gases from becoming mixed. To obviate this, the tubes conveying the gases were entirely independent one of the other, the two gases issuing from two separate orifices, the house gas from the larger orifice and the oxygen from the smaller, the latter blowing through the flame of the house gas. Such a jet is upon the table. I have also another jet in which the orifices, instead of being separated, as in the last case, are connected by a Y piece. This form ensures the issue of both gases at the same angle, the oxygen nipple being in the centre of the coal-gas flame. By this means one gets a more concentrated flame, and, I think, as a rule, a little better result than that given by the former. The best distance for the lime for burners of this description is from  $\frac{1}{2}$  in. to  $\frac{3}{4}$  in., or, better still, for the operator to look at the reflection of the lime in the condenser and to draw the lime to and from the burner until he sees no black spot. There are other forms of blow-through jets, but I shall speak of those under the heading of injector jets.

The injector jet is a jet in which the gas, at a high pressure, is made to force or inject gas at a lower pressure. As an instance, I take the form of jet where the Y piece connects the two tubes, and by inserting a nozzle in the Y we shall at once form a simple injector; but, in practice, this form of jet does not give the best of results. But, if the principle is employed in a different manner, as, for instance, in the Manchester Oxygen Co.'s jet before you, the principle of injection is more fully developed.

I have installed in a London music hall this form of jet for stage lighting, giving the utmost satisfaction, and, although they were at first suspected, they have been no trouble whatever, and are now running perhaps better than at first, owing to the greater confidence and practice of the operators.

In using this jet for biunial lanterns there is a difficulty in dissolving unless a very strong pressure of house gas is obtainable. The difficulty is due to the snapping or small explosions in the mixing chamber in dissolving. I attribute this to the high pressure of the oxygen and the low pressure of the house gas in the tubes from the burner to the dissolving tap. As an instance, say that a tube eight feet long filled at normal pressure with coal gas, and another tube eight feet long filled with oxygen at an atmosphere



pressure, you will have two volumes of oxygen to one of coal gas, and this is exactly what you get in the ejector jet from the dissolver. You cut off the supply in these proportions, hence the oxygen expands to form an explosive mixture in the chamber of the jet and explodes.

In working this jet I find it quite different to the blow-through jet. In the blow-through jet more coal gas is wanted, but with the injector jet you usually have too much, and it requires cutting off. In turning off the jet it is always best to turn on the house-gas tap full, then turn off the oxygen, and finally turn off the house gas. I have no doubt that, if a dissolver were made to work on this principle, it would remedy the failing I have described. While upon the subject of injector jets, I have here a separate injector with which any mixed jet can be used. It is only necessary to put a larger nipple upon the jet, and you can use your house gas.

The use of the injector in conjunction with the cylinder of coal gas and the house gas will be found very useful for increasing the pressure of the house gas. Instead of using compressed gas altogether, only a little need be used, and the higher pressure obtained at a minimum of expense.

*Electric Light.*—My experience has been entirely with the direct current arc light. In my hands it has been very simple and easy to work, and, with a lamp under perfect control and with the carbon holders both insulated, there should be little trouble. I think that electricians are likely to be too lavish in the quantity of current for lantern projection, thinking, doubtless, that what suits the kinematograph will suit the ordinary lantern. Sixty volts is what will usually be found best suited for the purpose. R. R. BEARD.

Mr. Alex. A. K. Tallent supplemented Mr. Beard's remarks upon the electric arc light for lanterns to the following effect: The idea, he took it for granted, was to get an illuminant as compact for lantern projection work as possible. This was easily obtained with a direct current for the reason that the soft core of the positive carbon soon gets white hot, forming a crater, and remains so for as long as the current is passing. It really forms a spot of intense brightness apart from the illumination proceeding from the surrounding portions of the pencil of carbon. These conditions, so easily obtained with the direct or continuous current, are not so readily secured when the current available is of the alternating kind. In the ordinary way the same effects previously described tend to take place with alternating current, but at each carbon, and consequently with a decreased brilliancy. It is clear, then, that the conditions must be modified so that the light is confined to the one carbon. It was found that this was best secured by having a soft-cored carbon for the top, and that core an eccentric one. Mr. Hepworth brought out such a carbon, the core running not through the centre, as is usual, but towards one side. This carbon is placed in the lantern with its core nearest the condenser. There is some difficulty in getting these eccentric carbons, but in such cases, as it not at all follows that they must be of circular section, one can take a centrally cored carbon and face it off. Another substitute can be made by filing a groove lengthwise in an ordinary carbon. This may also be done with the eccentrically cored carbon, laying bare the soft core almost. The bottom carbon may be one of the solid kind, and of smaller diameter than the one we have just dealt with. The result is that it does not reach that degree of heat which makes the core of the top carbon of a white heat.

Another factor which favours us is that the core of the top carbon is more or less protected from draughts. It will be found that the lower carbon under these conditions burns to a point like the negative direct current carbon, and if properly placed it does not obstruct the light emitted by the upper carbon. In arranging the carbon of the lamp for lantern projection, it must be remembered that one does not wish the light to proceed in all directions, as in the street electric lamp, where the carbons are in line. The light must be sent out to the condenser. This is arranged by stopping the lower carbon in advance of the upper, and canting them both at an angle backwards from the top. By putting the lower carbon in advance of the upper carbon we form the arc in front of the upper one, and largely prevent its rotation, so that our point is partly gained. By

canting the lamp we still further bring the arc to the front, but the correct angle must be determined by trial. Mr. Tallent projected, by a system of lenses, an enlarged image of the arc upon the screen, to show the effect of the dispositions described. He also showed a piece of apparatus of the nature of a pinhole camera, intended for the observation of the arc. It takes the shape of a small tube, at one end of which is the pinhole, and at the other a ground-glass screen ruled in cross lines. The pinhole end is placed about half an inch from the arc, and its image observed upon the screen. After once adjusting the carbons and getting the best light, any deviation would be noticed on the ground glass by the position of the arc's image on the line, and corrections and adjustments could be easily made. If the carbons be kept at a fixed relationship, one can be sure of the constancy of the light, which for many things is most desirable.

#### LONG AND SHORT-DISTANCE PROJECTION LANTERNS.

It will be manifest that an instrument more especially designed for use in a private dwelling-house would be practically of little utility for projection purposes in large halls or theatres. Therefore, in the selection or purchase of a lantern, it is important that some consideration be bestowed upon the special purposes for which such lantern will ultimately be required. In the event of a lantern being desired for home use only, the optical arrangements will differ materially from such as would be required in a lantern designed more particularly for long-distance projection.

In the latter, not only are long-focus objectives required, but the condensers to converge the pencils or rays of light passing from the lime ball through the picture or slide must also be of longer focus than would be the case were an objective employed for moderately short-distance working. It is just here where much misconception exists among amateur lanternists, the belief being very general that all that is necessary to adapt any well-constructed lantern for use at varying distances from the screen is the substitution of long or short-focus objectives in proportion to the distance it is desired to work from, whilst the equally important bearing which the condenser plays in such projection is entirely overlooked, for a condenser that yields admirable results in converging rays of light when employed in conjunction with a five or six-inch objective will fail to give anything like results in connexion with, say, an objective of twelve-inch focus.

Nearly all the trade or stock lanterns supplied by even our best opticians are fitted with what may be termed short-focus condensers and short-focus objectives, the idea, doubtless, being to adapt same more particularly for short-distance working, such as would be required in dwelling-houses, where the aim is to obtain the largest possible size of picture within the shortest distance from the screen. Such lanterns will be found, in all likelihood, to be fitted with double plano forms of condensers of about four inches focus when measured from the centre of the combinations, or three inches from the back lens to the lime ball when the jet is finally adjusted in its proper position for focussing the light upon the screen, with the aid of, say, a five or six-inch objective.

Now, there is really no difficulty in converging all the rays of light from a spot of, say, three-quarters of an inch (such as an ordinary lime cylinder yields with a good mixing jet at fairly high pressure) at a distance of six inches in front of the condenser, and such an optical arrangement will be found to work admirably, but the moment we come to change the six-inch objective for one of much longer focus—say, twelve inches or more—we introduce a radical change in the whole optical arrangements of the lantern. The jet which has hitherto been placed in its best position for the convergence of the rays at a distance of six inches in advance of the condenser will require to be placed considerably nearer the back lens of the condenser to converge the light at a greater distance than six inches in advance, and, as we have seen already, that, to gain the necessary amount of convergence with the short-focus condenser that is being employed, a distance of only three inches is available as an angle of incidence for the rays to spread over the face of the condenser, not only would the jet or lime ball be too near the back lens of the condenser, and hence very liable to fracture the same, but the corners of the picture would be improperly lighted. It therefore follows that, if we are to use long-focus objectives, we must provide suitable condensers, in order to so converge the light that they may be employed to their best advantage, and this is a most important point when selecting a lantern for long-distance projection. Strange to say, many of our salesmen with opticians, and who are supposed to be expert in lantern matters, are seldom found possessing a knowledge of this fact.

Another important matter in connexion with long-distance projection is the diameter of the back lens of the objective. In short-focus lenses, say, of about five to six inches, the diameter of the back lenses is generally found to be about one and five-eighths of an inch. Now, with short-focus condensers, it is quite easy to converge all the rays from a lime ball into a cone of such diameter at a distance of six inches in front of the



condenser, but, the moment we attempt to converge the rays into a similar cone at varying distances in advance, so soon do we find our difficulties beginning, and a point is soon reached when lenses of the diameter above stated (viz., one and five-eighths of an inch) will fail to grasp or pick up all the rays transmitted by the condenser. At this point such an objective will begin to lose light, and therefore, with the longer focus objectives, there must be provided larger diameter of objectives. Up to eight or nine inches in front of the condenser, objectives of two and a half inches will be found ample, but, when much longer-focus lenses are employed as objectives, then their diameters must likewise be increased, and every aid rendered by the employment of suitable longer-focus condensers.

In the early days of the lime light, when we had nothing like the pressure we have at present from gas cylinders, the practice of working so as to project as large a disc as possible from a short distance was quite a necessity so as to get the utmost amount of illumination, and no doubt this old practice has done much to foster short-distance projection even in the present day, but limelight procedure is quite a different matter now to what it was twenty-five years ago. Compressed gas has enabled improved jets being employed, and now, with suitable apparatus, it is possible to project a picture in a brilliant manner, which at that early period was practically impossible.

The advantages of long-distance projection over short-distance working are many, not the least of them being the comfort to an audience provided by their having no interruption in the form of the emission of light from the lantern placed in advance of them.

Speaking generally, but few schoolrooms or country halls will be met with that do not contain a floor space of at least fifty feet, and, whenever such have to be used for lantern entertainments or lectures, there is no better size of screen to employ than one of twelve feet or thereabouts, and to use a twelve-inch objective at a distance of about forty-five feet, which will yield a suitable sized picture on the twelve-foot sheet.

By working from the back of the audience, an operator can always depend upon less interruption than is the case when he finds himself surrounded and cramped by numerous inquisitive onlookers; and, further, he is enabled to take more licence with the doors and ventilators of his lamp than is possible when working in front of the audience.

As to brilliancy of light, if a good mixing jet be employed, there need be no anxiety; of course, the same results are not obtainable with a blow-through, but, then, no operator of experience nowadays ever thinks of employing such in long-distance projection. A well-packed mixing jet with a bore of  $\frac{3}{16}$  or  $\frac{1}{4}$  inch will yield all that is required in the way of light, and at the same time not overheat the lamp, as larger bores are very liable to do.

During recent years there has been a distinct movement on the part of lantern-makers to reduce the size of the shells in both the single and double forms of lanterns, until it is safe to assert that the thing has been ridiculously overdone. There may, indeed, be no need for such clumsy shells as were in vogue thirty years ago, but a lantern of good size will work much cooler than some of the small-sized articles now so prominently on the market, and it by no means follows that for single lantern projection wooden-lined bodies should be employed, these wooden bodies keep in the heat that would otherwise escape; a metal body will work cooler than a wooden-lined one, in so far as being less destructive to condensers.

The theory that light is lost by using long-focus condensers may be entirely discarded, any loss of light arising from the jet being drawn further back when long-focus condensers are employed is fully compensated for by the better class of jets now in use, and they are easily pushed to a greater extent without hissing than was formerly the case.

T. N. ARMSTRONG.

#### BOGUS WAR AND OTHER PICTURES.

THE extract from *South Africa*, given in these pages recently re the manufacture in Paris of war photographs to order, is very interesting. Stay-at-home photographers can have but little idea of the very large number of fraudulent photographs that are in existence both at home and abroad.

The first cinematograph pictures I ever saw of a war in actual progress were at the large music hall in Liverpool some years ago. The hall was crowded nightly by an enthusiastic audience, who applauded and encored the pictures of the Greeks and Turks in mortal combat in such a hearty manner that it would have made a happy man of the sickly monarch of the East had he been there to witness it. Knowing well the difficulty of photographing, let alone cinematographing, like pictures at such close quarters, I wrote to a well-known authority, and asked him if these war pictures were genuine. He replied that he "thought" they were. I, however, had my suspicions, but let the matter rest until I went on the Continent. There I made inquiries, which resulted not only in my getting into the circle of workers who produced such pictures, but I actually assisted in producing many other bogus war scenes. We are now told that certain Englishmen have gone out to the Transvaal with cinematographs, and I, with many others, am anxiously awaiting their results. I do not doubt for one single moment that excellent pictures, showing the movements of the British army will be obtained, but I shall

view with very great suspicion any films taken at close quarters, noting, as I do, the fact that the Boers' rifles and artillery will kill at long ranges.

I went over the Greek battlefields shortly after the war, and I should have found it a very easy matter to have "squared" a few natives to lay as dead upon the field had I needed such pictures, but I did not. Moreover, the guide I employed was the one that accompanied one of our most famous war correspondents to the front, and I value his little tricks too highly to give them away. I did, however, bring a Greek soldier's uniform back with me, and should ever another Greek war break out, I shall probably be the first to send to the illustrated papers an illustration of a Greek in ambush, dead upon the field, and so on. *ad lib.*

Let us now come nearer home. On one of our English churches is a world-famed bas-relief. I went one day to photograph it for a Continental firm. When I arrived at the church, I hunted high and low for my subject, but nowhere could I find it. Very soon the vergers came to my aid, and our conversation was something like this: "May I ask," said he, "if I can help you in any way?" "I am looking for the bas-relief," I replied, "as I want to photograph it." "There it is," said he, pointing to a small piece of stone a few inches square, about fifty feet from the ground, and in such a position that it was absolutely impossible to photograph. I was not the first photographer that had been there and found out the difficulty; the vergers, good men, had got used to photographers, and on my assuring him that I was not an amateur, but a person who had my bread to earn by the art, he took me on one side and said, "I have had a duplicate bas-relief made, and it hangs on the stone wall in my back garden. If you really want a photograph of it, meet me there in half an hour and do the job. No one knows the difference, and all professionals do it." Did I do as the vergers suggested and tip him half-a-crown, or did I build up a scaffold and do the right one? I will leave my readers to judge. That happened a few years ago, and I smile even now when I see pictures (not mine) of it in the London shop windows. This year, when travelling through Italy, I found many vergers there did the very same thing. I could tell of many more tricks, but have said enough—too much some may say—for the present.

RICHARD PENNAKE.

#### LANTERN NOTES AND NEWS.

THE Royal Photographic Society's Second Lantern Meeting will be held at 86, Russell-square on Tuesday, December 5, at eight p.m., when Mr. F. H. Evans will give a lecture upon "Lincoln Cathedral," illustrated by his own slides. Ladies are specially invited.

At the Röntgen Society's Ordinary General Meeting, to be held on Thursday, December 7, at 20, Hanover-square, a paper will be read by Mr. Mackenzie Davidson, M.B.: "Observations on Practical X-Ray Work, with Exhibition of Apparatus and Stereoscopic Skiagrams." Also Mr. J. Moore, F.R.C.S., Hon. Treasurer, will show, with the fluorescent screen, a case of "Bullet in the Brain."

At the Photographic Club, on November 15, Mr. J. Nesbit showed some lantern slides enlarged from Pocket Kodak negatives taken at Earl's Court amongst the Savage South Africans. Seen on the screen, they were of a very presentable appearance, and one especially was an admirable rendering of the smoke of a camp fire amongst the native huts.

At the London and Provincial Photographic Association, on November 23, Mr. T. E. Freshwater showed some examples of Duos du Hauron's method of producing stereoscopic pictures. The picture is printed in red and green inks, one over the other, but something like a quarter of an inch out of register. This is observed through spectacles fitted with green and red glasses, which single out the components of the double image, giving a stereoscopic representation of the subject. Mr. Freshwater also showed on the screen a number of slides of the Transvaal country taken within a few months of the outbreak of war. Coming at the present time, they attracted considerable attention, the views including scenes in Pretoria, Johannesburg, the mine district, and some of the early battlefields.

We append particulars of the Austin-Edwards Lantern-slide Competition: 1. The slide must have been made on an Austin-Edwards lantern plate, and the competitor must state this on entry form, which will be found in every packet of plates, and which must be filled up and sent with the slide entered for competition to the Austin-Edwards Film Works, Warwick. 2. Each slide and entry form must be sent in before the 3rd of the month in which the award is to be made. If it arrives later, it will be entered for the next Competition. 3. The prize slides become the property of Messrs. Austin-Edwards, and all unsuccessful slides will be returned, if stamps and addressed label be enclosed for this purpose. 4. Cheques will be sent to the prize-winners on the 15th of



the month. 5. Slides must be forwarded with all charges paid, and the senders should see that they are securely packed, as, in the event of loss or damage, Messrs. Austin-Edwards cannot accept responsibility. 6. This Competition is open to both amateurs and professionals. The slides will be judged in the lantern, and the awards will be made for the most effective and pleasing results, irrespective of subject, and the decision of Messrs. Austin-Edwards will be final.

Messrs. Percy Lund, Humphries, & Co., Bradford, send us samples of their lantern masks and gummed strips. Of the former there are some twenty or thirty rectangular shapes, while the latter, if mounted by the aid of hot water, have the property of adhering very firmly to the glass. Instructions accompany each box.

Messrs. J. J. Griffin & Sons, of 20-26, Sardinia-street, W.C., send us a sample box of their M. Q. Transparency developer, in tubes. This is their well-known M. Q. developer adapted for use with all lantern plates, though especially suitable for Messrs. Griffin's Gaslyt plates. Clear, brilliant positives of a rich black tone are produced with the developer used at its full strength, whereas warmer colours are obtained by increased dilution and the addition of a small quantity of potassium bromide. The developers are put up in hermetically sealed tubes, and the contents can be got at without shattering the glass, the corks being easily withdrawn.

#### PURIFICATION OF ACETYLENE.

In common with all other writers on acetylene, the *Engineer* states that it has repeatedly urged that, under the existing conditions of calcium-carbide manufacture, and the circumstance that this material is placed on the market in a "commercially pure" state, acetylene is not fitted to be used as an illuminant in dwelling-rooms unless it has been submitted to a rigorous and really chemical method of purification.

The gas can be evolved from carbide in two radically different ways: either by dropping the solid into a large excess of water, the so-called carbide-to-water principle, where the whole interior of the generator is full of water; or it can be prepared by bringing water into contact with carbide, the so-called water-to-carbide principle, where the whole interior of the generator is full of gas. We have already discussed the relative merits of the two processes, and in the present connexion have nothing to do with the matter except in so far as the impurities of the resulting gas are concerned. The normal impurities of crude acetylene, which are of sufficient importance to require attention, are three in number: ammonia, sulphuretted hydrogen, and phosphoretted hydrogen. The two former are very soluble in water, the second is chemically absorbed by lime-water, and therefore it is not surprising that, in carbide-to-water acetylene, phosphoretted hydrogen is practically the sole survivor. In another way also phosphoretted hydrogen is the impurity which gives most trouble to acetylene-users; ammonia and sulphuretted hydrogen have for many years been well-known impurities in illuminating gas. Methods for their extraction have been thoroughly worked out by coal-gas makers, and all that "acetylenists" have to do is to borrow or steal existing processes. In the coal-gas trade, owing to its enormous size, these impurities become actual sources of revenue, and it is necessary to remove them from the gas in such fashion that the sulphur and the ammonia may be recovered in saleable form. By the wildest flight of imagination it cannot be conceived that the ammonia and sulphur in calcium carbide shall ever become peculiarly valuable, therefore the generator-maker is free to employ any processes for their extraction which seem good in his eyes, quite irrespective of the manner in which those bodies suffer during the operation.

In the purification of acetylene, then, there is essentially but one substance to be dealt with, and this merits considerable study: first, because it is very difficult to remove without attacking the acetylene; secondly, because, left in the gas, it is far more objectionable and unhygienic than either or both of the others. On combustion, phosphoretted hydrogen is converted into phosphoric anhydride, which immediately takes up water, and becomes phosphoric acid. Phosphoric acid in a close room produces a whitish haze, misleadingly called by some generator-makers a smoke, and is very irritating to the mucous membrane of the nose and lungs. Traces of sulphuric acid are bad enough, both in this way and in their action on gold leaf; probably phosphoric acid would destroy picture frames and bookbindings to an equal extent, but it stands far beyond its rival as a throat irritant. In passing, perhaps a word of warning may be offered to those persons who are disposed to experiment wildly on the extraction of phosphoretted hydrogen. There are plenty of chemical substances that will oxidise and remove this impurity; the difficulty is to find something that will remove it without simultaneously oxidising the acetylene. Potassium permanganate and barium peroxide extract the phosphorus almost entirely, and some of the sulphur also; but they attack the acetylene, and cause much waste of gas. Potassium bichromate at first removes the phosphoretted hydrogen, leaving the sulphuretted hydrogen behind; but its activity soon falls off, and it is

not of much value as a purifying material. Ferric chloride touches neither the phosphorus nor the sulphur.

From the aspect of purification acetylene has passed through three stages. Originally purification was utterly ignored; next the gas was filtered through glass wool, asbestos, and similar straining materials, which undoubtedly are of service in extracting coke and lime dust, but which cannot be honestly termed purifiers; then some method of real chemical purification was found essential, and more or less intelligently was adopted. Writing in England, we fear the above sentence is scarcely correct; acetylene has not yet passed through the first two stages, it is still passing through them. Several English manufacturers have recognised the necessity of purification, and manfully have struggled to cope with it; others calmly put it on one side, smiling faintly when they are questioned about it; others provide their generators with purifying vessels containing some secret chemical (?) substance, and feel aggrieved when cautious expert writers will not affirm in print that the process is satisfactory.

Practically speaking, there are on the market at the present time three distinct methods of chemically purifying acetylene with varying degrees of efficiency. These are Ullmann's chromic acid, Frank's acid cuprous chloride, and chloride of lime. The primary reagents in the two former processes are solutions, but since liquids are not by way of being conveniently employed in practice, owing to the greater attention required during their utilisation and to the greater loss of pressure in the service when the gas has to pass through a column of reasonable height, they are now being used in the form of solids after absorption in kieselguhr. Ullmann's solidified chromic acid is called commercially "Heratol;" Frank's solidified cuprous chloride is known as "Frankolin."

During the past few months all these processes have been submitted to careful examination in Germany by a number of investigators, whose conclusions respecting the value of the Frank and Ullmann powders all agree substantially with the opinions expressed by Dr. Ahrens, to which we referred on p. 141 of our issue for August 11 last. Dr. Ahrens, it will be remembered, stated that chromic acid and cuprous chloride removed all the phosphoretted hydrogen, but left some sulphur behind, while chloride of lime extracted the whole of the impurities, but introduced others. The new impurities consist of carbonic oxide and certain compounds of chlorine, both sufficiently objectionable in their way; but, on the other hand, bleaching powder is so much cheaper and so much easier to manipulate that it is very desirable to be able to employ it. Moreover, on several occasions lately trouble has arisen with spent chloride of lime; every now and then it heats considerably, and in one case—at Budapest last spring—when the lid of an old purifier was lifted, the mass caught fire, injuring, we do not know how seriously, the man who was going to empty and recharge the vessel. Not altogether without cause, a small scare has sprung up, and chloride of lime has been proclaimed too dangerous a material to be adopted for removing the phosphoretted hydrogen from crude acetylene.

The earliest suggestion for using bleaching powder for this purpose was made by a couple of English, or Scotch inventors—English patent 24,414, 1896; the real credit of working out the idea undoubtedly belongs to Lunge and Cedercreutz. The latter chemists carried out many experiments about two years ago, and said not a word about heating. The same reagent, too, we understand, has successfully been employed, either alone or mixed with some other substances, for quite a long time, by one of the chief English firms engaged in the acetylene business, who, with perfect justice, claim that their material vastly improves the atmosphere of an unventilated room where the gas is to be burnt, and who assert that they have "hundreds of purifiers" in use "giving great satisfaction." Yet a short while ago Professor Vertess published an account of the acetylene installation at the Hungarian tower of Veszprim, in which he said that the burners smoked badly, and the gas exhibited all those defects which are recognised as characteristic of acetylene generated from calcium carbide of inferior quality and burnt without purification. In a later communication to one of the German technical journals, Dr. Ahrens referred to the Veszprim difficulty, and explained, without noticing Vertess's observations, the whole matter. He said that the acetylene of that town was regularly purified with chloride of lime, but that the gas smelt so strongly of chlorine—by this expression we presume he meant that the products of combustion smelt so strongly of chlorine—that the consumers grumbled and threatened to go "on strike," and therefore the purifying apparatus was either temporarily or permanently put on one side. In the absence of the purifying system, Professor Vertess, no doubt, examined the condition of affairs, and very naturally he heard complaints about the choking of the burners. The question thus arises, What is the practical value of chloride of lime as an acetylene purifier, and can it be employed with perfect safety or not?

The whole matter seems to turn, like so many other industrial problems, on several small and apparently insignificant details. If chloride of lime is properly used, it is satisfactory and safe; if it is improperly used, it is a nuisance and a possible source of danger.

Although it is perfectly practicable to do so, it is not convenient, in the small installations where acetylene is the illuminating agent, to use liquid purifying materials. Chloride of lime could be brought into solution, but a slightly damp powder is preferable for various reasons. The acetylene, therefore, must not be too damp when it enters the purifier.



Complete absence of moisture does not appear necessary; it is sufficient that the gas, either in the generator itself or in a separate condenser, shall be thoroughly cooled, and so freed from the greater portion of its water vapour. Ammonia must be removed from the gas before it comes in contact with the bleaching powder, or the violently explosive chloride of nitrogen may be formed. In apparatus of such design, therefore, that the acetylene does not bubble through water—in which, of course, ammonia is enormously soluble—a washing vessel must be put before the purifier, or, if preferred, a vessel holding a little weak sulphuric acid. By remembering these two necessities—absence of excessive moisture and freedom from ammonia—acetylene can be quite safely brought into contact with chloride of lime, and by that material all the impurities will be removed.\* Now, it is said that chloride adds carbonic oxide and chlorine compounds. We cannot imagine that a method of withdrawing the carbonic oxide can be worked out, but we do consider that such a process is really wanted, for the proportion of this highly poisonous gas thus introduced must be extremely minute, and the acetylene after treatment cannot be regarded as in any way comparable to modern coal gas enriched with carburetted water gas, or to carburetted or non-carburetted water gas itself, as regards toxicity. Probably, if this introduction of carbonic oxide had not been noticed by very careful chemists, the presence of the fresh impurity would have remained unrecognised for all time. The chloride compounds are more important, and, fortunately, are more amenable to treatment. By placing a second vessel charged with slaked lime only, after the bleaching powder purifier, almost all the chlorine added by the chloride can be removed without injuring the acetylene; and, as the percentage of chlorine compounds that need extraction must also be small, the second vessel should remain operative for a long while and require very little attention. In a recent investigation of chloride of lime for the present purpose, Dr. G. Benz has asserted that this lime vessel must always be added, and his prescription is endorsed by many other authorities. It most certainly appears a reasonable precaution, and should be followed until some means for preventing the formation of these chlorine compounds—if that be ever practicable—is discovered.

The occasional heating, and the possibility of a fire when the spent chloride is brought into contact with air and light in the operation of recharging the purifier, is an unpleasant phenomenon, but it is equally under complete control, if we may trust, as we entirely do, the latest information on the subject. Ahrens has found that chloride of lime, when used alone, does not exhibit this liability to become hot. It has been the custom with some firms to dilute the bleaching powder with sawdust in order to render it more porous and, by increasing its surface, make it a more energetic absorber of phosphoretted hydrogen. And it is precisely this mixture of chloride with sawdust which is principally liable to heat. Manifestly, there is no peculiar virtue in sawdust as a diluent; a host of other harmless indifferent substances are to be thought of on the spur of the moment. Inasmuch as sawdust has been shown to be harmful, some of these materials must be substituted. Ahrens and Benz both make suggestions: coarsely powdered brick, coke, slag, kieselguhr, &c., will serve. Ahrens also remarks that the chloride must be mixed either with very little water or with a very large quantity of sawdust, to make it quite safe; but, we submit, the total avoidance of the organic matter of wood is distinctly more advantageous.

Quite recently an accident occurred in a mill at Württemberg, where chloride of lime mixed with kieselguhr was being used; the water-seal of the purifier was blown out, the holder bell was lifted, the gas caught fire and suffocated several workmen, who remained unconscious for some hours. After the explosion the purifying material was found to be pasty with water, although it had been introduced into the vessel in a dry state. This catastrophe seems to have been due to the gas passing directly from the generator into the purifier very hot and loaded with moisture; not improbably also the carbide was unusually bad, and the acetylene contained a notable proportion of ammonia. The trouble was aggravated by the employment of an abnormally large purifier, for it is reported that some ninety times more chloride was present than was necessary to deal with the whole of the gas evolved by the generating apparatus.

Thus we see that, by keeping the original acetylene free from too much moisture, removing the ammonia, treating it with chloride of lime, diluted, if necessary, with some inert inorganic substance, and making it afterwards pass through a vessel of slaked lime, more of the impurities in the crude gas are extracted than if the Frank or the Ullmann process be adopted. The operation is said to be simpler for a non-chemical attendant; it is obviously far cheaper. The one disadvantage of the purified gas, its minute percentage of carbonic oxide, is far too trivial to be considered, and no fear need be felt that the half-spent material may become a source of anxiety by overheating, or the spent material a source of danger by actually catching fire.

#### FUN WITH A FLASHLIGHT.

Yes, I've had all kinds of trouble, and I have tried to profit by the troubles of others in flashlight photography.

\* This statement is distinctly admitted by Ullmann and Goldberg in a recent article, and Ullmann is the advocate of chromic acid.

It both amuses and instructs me to see a brother camerist struggle for supremacy with a flash lamp, says Emil Morhardt in the *Photo Era*, a sensitive plate, and fifteen or twenty people who don't want to be in the picture, but have no choice in the matter.

James, the pet of the family, who is having the card party or tiddle-de-winks evening, has announced that he is going to take a flashlight group. To refuse to be in it is to mortally offend Mrs. Hostess, who has done so much for the evening's entertainment—chocolate cake and home-made ice cream. So we silently step into line, brace ourselves against the wall, with a window for background, and a bird-cage tickling our left ear, and await the ordeal.

James puts his head under the cloth, and vainly endeavours to focus on a candle flame which his little sister parades from one end of the group to the other.

"You will have to stand closer together." We are packed like sardines as it is; and, goodness knows, when we get closer, what will some of the blushing maidens do when they find that the new man with the *fleur-de-lis* tie has his head on Miss Modest's shoulder?

We are finally all on, but it is certainly warm, and fully as hard work as going to grocery for your wife. James strikes a match, and it is promptly followed by a miniature explosion, a blinding flash, and the crash of a tin pan falling from the top of the step ladder. As soon as the smoke of battle clears a little, it reveals James hopping around the room, with his right hand in his mouth, or as much of it as he can conveniently stuff in, and Mother Hostess and sister vainly trying to comfort him.

He had used four boxes of powder, and it made a good flash, indeed it did, but it was all lost; for Ed, who has had experience with an AxA snapper, cries out cheerfully, "Why, old boy, you forgot to put in your plate-holder!"

That was one experience. I had another when I tried to take my best girl and myself in the grape arbour, fondly caressing her white figure. Something was wrong somewhere, for all I got was eyes. Still, she forgave the murderous expression, and we are married now, and have studied the thing out together, and bought a flashlight.

We tried it at home the other evening, and it worked finely. So we decided to take it over to Harry's, and take a picture of his wife. All went finely; pose was good, plate-holder in, lens uncapped, and a hard blow at end of rubber tube. Result—*nil*. Another blow, another blank. Poes getting stiff, patience tired, and that fool Jones laughing enough to kill himself.

I explained that the thing got stopped up carrying it over there, and cleaned and reloaded it again, and it works like a charm. It takes some time, though, to smooth out that sensation of disgrace, and dust the magnesium powder from our clothes.

*Moral*.—Don't have any one looking when you take a flashlight, and be sure and blame a failure to the machine.

#### THE GREAT TELESCOPE OF THE PARIS EXPOSITION OF 1900.

AMONG the scientific exhibits at the Paris Exposition of 1900, the great telescope will undoubtedly be the most interesting and important object shown. We are indebted to our contemporary, the *Scientific-American*, for the following description of the instrument:—

It consists of a horizontal tube, 197 feet long, provided with an objective 4.1 feet in diameter. The image of the moon or stars will be sent through this tube by the aid of a Foucault siderostat; that is to say, by a movable plane mirror. The focal length of the telescope of the Yerkes Observatory is but 65.6 feet, so that it will be readily seen that, with a telescope whose focal length was 197 feet, it would be almost impossible to build a dome and mountings which would carry it. It is estimated that a 210-foot cupola would have been required, so the use of a fixed tube and a movable mirror for gathering the image may be regarded as an excellent solution of a mechanical difficulty. The siderostat is undoubtedly the most interesting part of the instrument. It consists of a large cast-iron frame, and is provided with clockwork and devices for causing the mirror to follow the celestial object which is being viewed. The frame is now under construction at the establishment of M. P. Gautier, a distinguished manufacturer of instruments of precision. It is 26½ feet long, and the height is the same as its length. It is provided with six levelling screws, which enter into sockets fixed upon a stone base 5.57 feet high. The hour axis is actuated by clockwork through the aid of tangent screws. The part of the instrument toward the south carries the mirror, which is mounted in a cast steel cell, lined with felt in order to prevent any contact of the mirror with the metal. The equilibrium of the mirror and cell is obtained by means of levers and counterpoises. The base of this mounting floats in a reservoir 6½ feet in diameter, and containing about 16 gallons of mercury. Owing to the application of the principle of Archimedes, the movable parts will be relieved of nine-tenths of its weight. The system of the levers and counterpoises is so well arranged that all of the movable parts can be actuated by hand even without the aid of the mercury. The total weight of the siderostat is 99,000 pounds; the moveable part weighs 33,000 pounds, of which the mirror and its cell weighs 14,740 pounds. A weight of 220 pounds is sufficient to actuate the clockwork.



The mirror has a diameter of 6.56 feet; it is 10.63 inches thick, and its weight is 7920 pounds, and it was naturally the most difficult part of the apparatus to construct. The glass was cast at the Jeumont Works, and a special furnace was constructed capable of holding 22.4 tons of glass. When the time for casting arrived, the mould, 6.72 feet in diameter and 12 inches thick, was brought to the furnace upon a truck, and then, after being filled, was introduced into the furnace, which had been raised to a high temperature. It was then walled up in this furnace, and the cooling required a month. Notwithstanding all the precautions, several of the discs that were cast broke in pieces with a loud noise. The transportation of such a huge disc of glass to Paris was a difficult matter, and a special train carried it there without stopping. A crane deposited the gigantic block on a waggon, and it was carried to the optical establishment at night, in order to have a clear roadway.

To obtain a fine disc of glass of such dimensions was, of course, difficult, but to give it a perfectly plane surface was a much greater one, and M. Gautier is to be congratulated upon the success which he has attained in performing this difficult operation.

The polishing machine was placed in a special shop, protected as much as possible from variations in temperature by a double wooden wall. The grinding apparatus consists essentially of a large cast-iron plate, covered with an inch of flannel, upon which the glass disc was carefully laid.

This plate revolves slowly around a vertical axis by gearing, the whole being stepped in a cone. Above there is a stationary circular bronze rubber, 47½ inches in diameter, which is given a reciprocating motion by a slider, thus passing across the face of the mirror, travelling in a circle beneath it. The perfect revolution of the plate and the accurate adjusting of the slides and their parallelism resulted in the production of a perfect mirror. It required three months to adjust the slides alone. The grinding of the mirror was done with a mixture of emery and water. During this operation a workman always stood at a respectful distance from the apparatus, so as not to change the temperature of it. From time to time he injected a mixture of emery and water by means of a syringe into a channel running through the grinding plate and ending at the centre. This work was carried on generally from two to five o'clock in the afternoon, the time of day when the temperature does not change perceptibly. The entire morning was devoted to the cleaning of the machine and to the verification of the parallelism of the grinding plate with the surface of the mirror, an operation which was performed with four scales, which were accurate to one one-thousandth of a millimetre.

As the grinding proceeded, finer and finer emery was used, and the closer the grinding plate was brought to the surface of the glass. With the finest emery the distance between the plate and the glass was 0.008 inch. The grinding lasted eight months, and was followed by the operation of polishing, which required two months. The lower surface of the polishing plate was covered with a sheet of albumenised paper, like that used in photography, but unsensitised. The workmen spread upon this paper a small quantity of the finest Venetian tripoli, and as much as possible was removed with a soft brush. The distance between the rubber and the surface of the glass was 0.0012 of an inch.

This method of treatment, notwithstanding its delicacy, produces enough heat to render the mirror slightly convex, and cause it to draw away more strongly in the centre, so that, upon cooling, it was hollowed at this point. In order to surmount this difficulty, the slides were given a curve, of which the pitch was 0.4 of an inch. The heat was diminished by operating the machine for a minute, and then stopping for a quarter of an hour. When the hand is applied to the mirror, there occurs an extension of 0.0012 of an inch, which is sufficient to distort completely for four or five minutes the image of the flame of a lamp placed at one side of the plate and observed from the other with a small telescope arranged for the purpose. The next operation to be performed is the silvering, and, of course, it will have to be silvered anew from time to time. The mirror protrudes 5.4 inches from its tube or cell, which will be made to swing so as to bring the surface to be silvered underneath. The reservoir containing the bath will be lifted by means of a winch until the mirror enters it at a proper depth. When the operation is finished, the reservoir will be lowered, and the silvered surface turned upwards, and the mirror readjusted in its cell.

The images of the mirror, which are transmitted to the focus of the objective, may be examined directly by means of an eyepiece, or they may be thrown upon a sensitised plate, or projected upon a screen placed in a hall set apart for that purpose, so that several thousand people will be able to examine the celestial object at the same time. The tube of the telescope is a steel plate three-quarters of an inch in thickness and five feet in diameter. It is made up of twenty-four sections joined with the aid of bolts. These sections, when all mounted, will rest upon a cast-iron base, supported by stone columns. It is arranged so as to slide to take up the expansion and contraction. The tube plays no part in the formation of the images, nor does it serve for supporting the objectives in the eyepiece, but it prevents dust from introducing itself between the essential parts of the apparatus.

One of the objectives is designed for visual observations, and the other for photographic work. Both are mounted upon a carriage made to roll upon rails so that either of them may be easily placed in position before

the tube. The weight of either of these objectives, without its mounting, is about 1295 pounds, and, with the mounting, 1980 pounds. Each of the crown glasses is carried by rollers, so that it may be separated from the flint glass in order to render the cleaning of each disc easy. The lenses will cost \$120,000.

The discs were cast by Mantois, of Paris. Great attention was paid to the casting of the glass. Specimens of the glass were constantly taken out during the heating and examined with a lens under different conditions of illumination in order to judge of the degree of purity which they have reached. After several specimens have been found to be free from bubbles, the temperature is reduced, the glass thickens, the crucible is opened, and a certain portion of the surface is skimmed off to get rid of impurities. The glass is then stirred, and the cooling is allowed to proceed rapidly for five or six hours until the surface of the glass emits a well-defined sound when it is struck with an iron bar. After this step it is necessary to proceed with annealing. The furnace is walled up, and a cooling is allowed to proceed which requires from four to six weeks. When the crucible is opened, the glass is found to have been broken into pieces of varying sizes. In order to obtain a 792 pound flint-glass lens it is necessary to find a block which weighs nearly 1300 pounds, and, such a block having been found among those in the furnace, it is removed and placed upon a car. Slabs of glass are sawed from two parallel sides in order to obtain polished surfaces that facilitate a perfect examination of it.

The striae in the surface are removed, and, if after this, the block exhibits any defects situated at such a depth that they cannot be removed, it is submitted to a moulding which changes its form and brings the chief defects near the surface. The block is placed in a mould of refractory clay, and put into a furnace and heated to 800° to 900° C. By this means it becomes slowly heated and softened until it assumes the form of the mould, but it must not become fused, or the whole operation must be gone over again. If the outcome of the process is successful, the glass is slowly annealed, and is then taken from the mould and examined anew. If any defects deep in the glass are seen, a second operation is begun with a mould of another form. Finally, when the glass is very pure and perfect, another and final moulding produces the plano-convex lens. After this comes another heating and cooling, which takes two or three weeks.

At this point the glass discs are taken to the establishment of M. Gautier, where the surfaces are polished with a device like that used in polishing the mirror, except that the slides have the curve that is to be given to the disc. A long time is required in polishing out the small imperfections, and finally the lens is entirely corrected and ready for mounting.

The tube which carries the eyepiece is supported by four wheels rolling upon rails. It is attached to the telescope by an adjusting screw, 4.92 feet in length, which serves for putting it in focus. In the interior of this tube another is mounted upon rollers. This inner tube is 3.54 feet in diameter, and is moved circularly by means of clockwork through the medium of a tangent screw which fits into the teeth of a circle fixed to its outer extremity. In this first circle, which moves upon four rollers, is a second circle, which carries two guides, and in which slides a carriage having a travel equal to a little more than two minutes of time. This is actuated by a screw which causes the motion in another clockwork. This carriage is provided with a system of frames having rectilinear motion, that permits of giving the eyepiece different positions. The upper frame is so arranged that it may receive devices for photography, micrometry, spectroscopy, or a projecting apparatus. The exact location of the telescope has not yet been determined upon, but it will be at the service of the Exposition, and will probably be placed somewhere where the atmosphere is purer than that of Paris.

#### THE AUSTIN-EDWARDS LANTERN PLATE.

MANUFACTURED BY AUSTIN EDWARDS, WARWICK.

FROM Mr. Austin Edwards we have received samples of two new kinds of lantern plates he is introducing—red label for ordinary dark-room working, blue for gaslight development. The following instructions give the characteristic features of the latter plates, with the method of their manipulation:—They can be developed with an ordinary pyro-soda developer as used for negatives, and will yield rich, warm, velvety tones of the precise tone best suited for lantern-slide work—liquid in the shadows and transparent in the high lights. The chief advantage of the blue label plates is found in the fact that they are so little sensitive to yellow light that they may be used without a dark room, all operations being carried on in gas or candle light, while at the same time they are not too slow to be exposed by gaslight, working close to the flame.

#### EXPOSURE AND DEVELOPMENT OF THE BLUE LABEL PLATES.

*Exposure.*—The plates may be exposed under a negative in an ordinary printing frame, either to subdued daylight, magnesium, or gaslight. The exposure will vary according to the colour desired in the finished transparency. For black tones a shorter exposure is required than for warm tones, about one to two minutes at four inches distance from the flame of a gas-burner will be sufficient for black tones. The best method of



exposing the plates is to use burning magnesium ribbon, as this gives the power of easily regulating the exposure according to the density of the negative. Thus, with a negative of average density, one inch of ribbon burnt at twelve inches from the printing frame will give a good black tone. With a thin or weak negative the distance should be increased. For warm tones use from four to six inches of magnesium ribbon at the same distance.

*Development.*—They may be safely developed and handled by candle or gaslight, no dark room being necessary. It is well to keep the plates shielded from direct light, and work at some distance (say, six feet) from the light while developing.

#### PYRO-SODA DEVELOPER, GIVING ANY TONE FROM BLACK TO CRIMSON.

##### Stock Pyro Solution.

Pyrogalllic acid .....	1 ounce.
Nitric acid .....	20 drops.
Water .....	8 ounces.
Add the acid to the water before dissolving the pyro.	
No. 1.—Stock solution .....	2 ounces.
Water .....	20 "
No. 2.—Sulphite soda .....	2½ ounces.
Carbonate soda .....	2½ "
Bromide potass. ....	10 grains.
Water .....	20 ounces.
No. 3.—Bromide amm. ....	2 ounces.
Water .....	20 "

For black tones use equal parts 1 and 2, exposure about one inch magnesium at twelve inches. Time of development, about two minutes.

For brown tones use two parts No. 1, two parts No. 2, and one part No. 3, and double the exposure. Time of development, about three minutes.

For red tones use equal parts 1, 2, and 3, and again double the exposure. Time of development, about four or five minutes.

We hope to give the results of a practical trial of the plates on a future occasion.

#### COLOUR PHOTOGRAPHY.—THE McDONOUGH PROCESS.

At the Columbia Photographic Society, Philadelphia, on October 16 and 18, the editor of the *Camera*, assisted by Mr. P. A. Mitchell, gave a demonstration on "Colour Photography by the McDonough Process of Colour Photography." The entire method of the work was fully explained, over fifty slides (made by the process) shown, and the manner of making the exposures, &c., demonstrated. The following are extracts from Mr. Chambers' lecture:—

"Colour photography, which has been much in experiment in this country and abroad for years past, has now practically reached a state of perfection. Few of us realise the difficulties encountered by the inventors of the processes on the market, and the most simple, the one easiest understood by the amateur, is the one we here demonstrate this evening, the McDonough process. The expense in using this is very small, the cost of fitting up a camera but a trifle, and the results gratifying. The method of photographing colour by this process is on the scientific principle of the mixed coloured light. Many scientists have demonstrated that the elementary or primary colours of a ray of sunlight are red, green, and blue, and the mixture of these on the retina of the eye produces the colour sensation of white, and all the various shades of colour are the resultant of these three fundamental sensations. In the McDonough process the essentials employed for making a negative are a Taking Screen, Chromatic Balance Shutter, and Erythro dry plates, the latter being the Seed 26 x normal plate orthochromatised for the red wave-lengths of light. The Taking Screen is a plate of glass coated with gelatine emulsion and ruled in red, green, and blue parallel lines from 300 to 600 to each inch, in the order named. This Taking Screen is adjusted in a metal frame inside the camera, and attached to a lever conveniently placed outside the box, where it can be used to throw the Taking Screen in contact with the Erythro dry plate when slide of plate-holder is withdrawn to make exposure. The Chromatic Balance Shutter, which is placed on hood of lens, is made with sectors of lemon-yellow and orange-coloured glass or mica, actuated by a metal finger, and its office is to balance the varying conditions of illumination, there being less blue in bright sunlight than with cloudy skies, or when photographing indoors. The adjustment of the shutter for the difference in illumination is by moving the metal finger to open or close the coloured sectors. A negative made under conditions noted will show in duplicate the lines of the Taking screen, but with different degrees of opacity according to the light value that has fallen upon the silver haloids of the sensitised Erythro dry plate through the Taking Screen and Chromatic Balance Shutter. Their colour value lines are transferred to the positive, which is made in the ordinary manner, by superposition, using any good transparency dry plate, and the transparency or positive so obtained is placed in contact with a Viewing Screen, which is made exactly like the Taking Screen, only on thinner glass, the red, green, and blue lines corresponding in number to those used on the Taking Screen, and the lines on positive or transparency and Viewing Screen being in parallel or

register, the colour appears as in the object photographed. When this is done, fasten the two together with spring clips, bind the edges with adhesive strips, and the positive is ready for the window or projection in the lantern.

"Several things are peculiar to the McDonough process regarding the matter of development. There is no choice as regards a certain developer being used—any kind may be employed; the only thing is that it is necessary to use it slightly weaker, and with reduced quantity of alkali; that is to say, if you were to use a developer requiring 4 ounces of water, you would add fifty per cent. more, making it 6 ounces. Then, if the completed mixture would make, say, from 8 to 10 fluid ounces of developer, we add ½ an ounce of a ten per cent. solution potassium bromide; we do this owing to the extreme sensitiveness of the plate, and in order to prevent fog from over-exposure and development. I might say that, in all my experiments with the process, I have not had one fogged plate in my developing, and, in cases where I have deliberately over-exposed, I have been able to control it, and secure a perfect negative by the use of my bromide. The Erythro plate employed is extremely sensitive to the red light in the dark room; my plates were developed in practical darkness, and after two tests I found that I could employ time developments and secure absolutely perfect results. The other evening I purposely tested one of these plates under the red light; one-third of the plate was covered, and the other two-thirds developed with the red light shining upon it. The result is that two-thirds of the plate exposed to the red light is most beautifully fogged. The one-third of the plate which was partly shielded does not show this trouble. In my method of exposure I found a Wynne meter a great boon; in fact, I would have been totally at sea without its aid at first, as these plates require a more lengthy exposure than the normal Seed's 26 x, owing to their special preparation.

"The International Colour-photo Company, of Chicago, to whom I am indebted for the manner and form of testing this process, furnished me with a formula for developing my transparency plates. I not only find this excellent for my work with the colour-process transparencies, but it is also fine for ordinary slides. I will give it to you:—

Water .....	24 ounces.
Hydroquinone .....	180 grains.
Sulphite soda (crystals) .....	5½ ounces.
Formaldehyde (40 per cent.) .....	3 drachms.

"This is the stock solution. For use, to the 4 ounces of the stock solution add 2 drachms of ten per cent. bromide of potassium. This may strike you as rather peculiar, as no alkali is mentioned in the shape of soda or potash; but the formaldehyde fills all the requirements of an alkali, and it also prevents shrinkage in the films."

#### THE WOODBURY LANTERN SLIDES.

Eyre & Spottiswoode (Woodbury Department), Great New-street, E.C.

The always-admired qualities of lantern slides by the Woodbury process, which for many years past has been considered, by those best competent to judge, as the most charming method for the production of transparencies for the optical lantern, has once again been demonstrated to us from an inspection of a series of slides made from historical pictures illustrative of the principal events of Her Majesty's reign. All the beauties of the process are well brought out in this series, to which Messrs. Eyre & Spottiswoode are constantly making additions, and thus, in a short space of time, the trade will have at its disposal a wide selection of Woodbury slides for the purpose of introducing to the notice of those whose business it is to give optical lantern-slide entertainments.

We append extracts from Messrs. Eyre & Spottiswoode's lantern lecture circular for the season 1899-1900, which gives detailed particulars of the sets already available. We can say of a Woodbury lantern slide that it is a thing of beauty and a joy for ever.

Four lectures have just been published, entitled:—

1. The Romance of a Reign; or, Victoria, Queen and Empress.
2. Through Shot and Shell; or, Nelson and His Times.
3. Gems from the Galleries; or, An Evening with the Masterpieces of the World's Art.
4. The Bible and the Monuments; or, Parallels to, and Illustrations of, the Bible Story.

Messrs. Eyre & Spottiswoode have in immediate preparation a new lecture, entitled "The Boer War Day by Day." Each set consists of about sixty slides, and a lecture is supplied.

#### THE REAL DICKENS LAND.

At the New Lecture Hall, East Finchley, on Monday, December 4, 1899, at eight o'clock, a lecture, entitled "The Real Dickens Land," will be given by Mr. H. Snowden Ward, editor of the *Photogram*, and author of *Shakespeare's Town and Times*.

Every place that is mentioned has been visited, carefully studied, and photographed, and with the principal scenes in London the lecturer is from long and intimate acquaintance.

The lecture will be illustrated by about 120 lantern slides from negatives specially taken by Mrs. Catherine Weed Barnes Ward.











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